



The 9th Arctic Regional Hydrographic Commission Conference
Murmansk, Russian Federation
17-19 September 2019

**Report of the IHO Marine Spatial Data Information Working Group
(IHO MSDIWG)**

This report contains the current status and planned actions of the IHO MSDIWG.

Meetings Held During Reporting Period

Dates and venues of meetings held during the reporting period.

The MSDIWG10 meeting of IHO Marine Spatial Data Infrastructures Working Group (MSDIWG) took place in Busan, Republic of Korea, 4 - 5 March 2019. The meeting was followed by the OGC Marine DWG Meeting, 6 March 2019 and the UN-GGIM Working Group on Marine Geospatial Information (WGMGI1) Meeting, 7 - 9 March 2019.



Figure 2. The IHO MSDIWG members attending the MSDIWG 10 meeting

Members of the MSDIWG has represented the MSDIWG in other IHO WG meetings e.g. HSSC11, SPRWG1, CSBWG7, CBSC11 and in several Regional Hydrographic Commission meetings.

Dates and venue for next meeting.

The IHO/MSDIWG will arrange a MSDI Open Forum meeting, the MSDIWG11 meeting with an integrated OGC Marine Domain WG part in 2020 in Rostock, Germany 24-27 February.

Logistics and meeting details will be available at: www.iho.int/msdiwg

Work Program

Work Plan 2018–2021. The Work Programme was discussed and evaluated at the MSDIWG10 based on recent achieved results with a focus on MSDI from an international, regional and national perspective. In order to deliver this Work Programme, eight MSDI Tasks have been established.

The IHO/MSDIWG will continue to facilitate a MSDI Open Forum which would allow non-MSDIWG stakeholders (e.g., Regional Hydrographic Commission (RHC) Members, government, academia, industry, funding agencies and NGOs) to attend to identify what the MSDIWG and the commercial partners can offer. Attendees at the Open Forum would then be encouraged to stay on for the MSDIWG11 meeting. This approach is being developed in consultation with the hosts.

The key interest for the IHO is enabling Member States to ensure MSDI provides a framework for the provision of hydrographic information beyond the traditional field of surface navigation. The MSDI WG is working with the UN-GGIM Shared Guiding Principles for Geospatial Information Management as a framework and the principles are incorporated in the existing work program for the MSDI WG. The Shared Guiding Principles for Geospatial Information Management are available at the MSDI WG web page at: www.iho.int/msdiwg → Body of Knowledge

Progress on IRCC Action Items

MSDI Ambassadors.

IRCC9/18 (RHC Chairs to encourage Member States in the region to nominate RHC MSDI Ambassadors to promote MSDI and to help Member States to prepare the national reports with respect to the status of MSDI). A vital element of this work would be to collect and collate responses from Member State on MSDI prior to each RHC meeting. Several RHCs have now established regional MSDI WGs, and at the IHO MSDI WG10 meeting reports from RHC MSDI WG were presented.

It is important that RHC consider taking MSDI as a RHC agenda item and that National Reports should incorporate the status of MSDI, plans for involvement in MSDI and challenges facing the HO.

It is recommended that the National Reports include the topics from C-17, item 2.1 on what constitutes a MSDI:

- Policy and Governance
- People & Organizations
- Enablers (the framework for data acquisition, management, updating and dissemination)
 - Standards
 - Technology
 - Metadata
- IHO S-100 Universal Hydrographic Data Model
- Content
- Education and Learning

Education and Learning.

IRCC10/10 (MSDI WG to develop basic MSDI training material in order to allow RHCs to deliver trainings with their own personnel). At the latest IRCC meeting, MSDI was highlighted as an important component of the future development of hydrographic offices. It was concluded that there is either no, or very little, basic teaching material available for MSDI training that is free of charge for IHO Member States. IRCC therefore decided to task the IHO MSDI WG to establish basic MSDI training material, in order for IHO Member States and the RHCs to conduct basic MSDI education/training. The Danish Geodata Agency (DGA) volunteered to finance the development of the training material. The MSDI training material should be available free of charge from the IHO webpage and from the DGA webpage.

The establishment of MSDI training material, including the teaching material, will be divided into two phases:

Phase 1. MSDI orientation. The course is aimed at students who are marine-focused, but have very little experience of MSDI concepts or practice.

This course is modelled on the IHO MSDI WG standard orientation syllabus and is aimed at decision makers possibly at a senior level, not necessarily from a hydrographic background, but certainly involved in marine geospatial data.

Phase 2. Fundamentals of a Marine Spatial Data Infrastructure. The course is aimed at students who are marine geospatial professionals but who have very little experience of MSDI. It is designed as an introductory, one-day course in the fundamentals of MSDI concepts, theory, and practice.

The course is based on material in the public domain, the many sources of information about MSDI available, and includes notes on the accompanying slides and exercises to be considered as appropriately. These exercises would also be useful in a group context for the delivery of workshops supporting the course. There are two main uses of these documents in conjunction with the course slides themselves.

1. A participant who wants to download and self-learn from the materials provided.
2. A participant who wishes to deliver the materials in a group setting with stakeholders.

In phase 1, the actual MSDI and teaching material will be established, which could/should be based on the publication C-17 Spatial Data Infrastructures "The Marine Dimension", including Annex 1. Syllabus for Educational and Training Programs for Marine Spatial Data Infrastructures. There should be focus on the

content specified in the two introductory teaching courses 1) MSDI orientation and 2) Fundamentals of Marine Spatial Data Infrastructure (MSDI). The result/deliverables in this phase will be the actual MSDI training material and the teaching material for use by e.g. internal “teachers” in the hydrographic offices.

In phase 2, a MSDI e-learning program will be developed that should allow people to access MSDI teaching externally and even receive the teaching on-line. The MSDI teaching materials will be available on the IHO's website for free and on the DGA's own website. Progress will be summarized during the reporting period.

Any Other Items of Note

UN-GGIM WORKING GROUP ON MARINE GEOSPATIAL INFORMATION (WGMGI)

The first expert meeting of the Working Group was arranged as a back-to-back meeting with the IHO MSDIWG meeting. The meeting was attended by 42 expert representatives from Australia, Brazil, Denmark, Germany, Italy, Jamaica, Netherlands, Norway, Republic of Korea, Singapore, United Kingdom, United States of America, International Hydrographic Organization, Open Geospatial Consortium and UN-GGIM/Private Sector Network.

This meeting, among others, agreed that marine geospatial information must be made available, accessible and discoverable for a multiplicity of purposes within collaborative information systems nationally to deliver reliable, timely, and quality information necessary for citizens, organizations, and governments to build accountable actions and make informed/evidenced-based policies and decisions. For more information please visit the meeting web-page <http://ggim.un.org/meetings/2019/WG-MGI-Busan>. There is also a link to the meeting web-page from the Working Group's web-page at: <http://ggim.un.org/UNGGIM-wg8>.

Data integrity, marine boundaries from a MSDI perspective.

The MSDIWG has discussed data security from a MSDI perspective. The conclusion the MSDIWG came to when looking at these issues from the MSDI perspective was that one of the main priority is actually data “integrity”, also dealt with comprehensively by IHO S-63. Data integrity establishes two pieces of knowledge for data users, (1) knowing who a piece of data came from and (2) the knowledge that the data has not changed in its journey to the end user.

This is important from a MSDI perspective because the core concept of MSDI is reuse of marine geospatial data outside its traditional use case of primary SOLAS navigation, and within a much broader sphere of activity. The nature of some of the datasets may well be sensitive, not because they are confidential, but because there is a high impact cost of them being wrong. If an MSDI provider wrongly attributes a dataset to a particular official body or incorrectly reproduces a dataset (either by visualizing it poorly or providing a copy of the incorrect data), the repercussions can be large.

By way of example, consider that one of the fundamental datasets recently under consideration are UNCLOS maritime limits and boundaries (other examples exist but this is a robust, simple example which is useful for the purposes of illustrating the problem). UNCLOS official limits and boundaries are a foundation dataset and often used to further denote other official limits and boundaries such as marine protected areas, fishing zones and many others, defining rights and responsibilities as part of a harmonized marine cadastral system. These datasets are simple, by comparison with the complex geospatial data which make up ENC, but because they represent the results of, often long standing, political agreements and treaties, their economic and political weight can be enormous and the impact of their incorrect reproduction within a MSDI environment is of concern.

The challenge technically is to provide the means and mechanisms, therefore, to protect the data integrity and assure the end user of the provenance of the data they are receiving.

Is there a ready-made solution?

- Ongoing the IHO and MSDI community needs to consider this issue
- Consider adapting existing mechanisms:
 - Stream based may not be suitable for “data centric” models
 - IHO S-63 (and S-101) relies on a specific end user system
 - Other standards exist but may need adaptation
 - All data integrity systems require a “trust network” to define identity.

Justification and Impacts

The work in the MSDIWG is progressing well and a supporting Action Plan has been established. The Work Programme creates the framework for the WG, in order to cope with the challenges in a forward-looking perspective.

The creation of regional MSDIWGs will give the Member States direct possibility to actively participate in the development of a well-functioning MSDI within the region's hydrographic domain and its surroundings. Additionally, regional MSDIWGs benefit from both national and regional SDI activities in order to lead and address MSDI matters for the countries in the region.

Action required of ARHC 9:

The ARHC 9 is invited to:

- a. Note the report;
- b. Take any other action as appropriate.