

**ONLINE 13<sup>th</sup> MEETING OF THE IHO MARINE SPATIAL DATA INFRASTRUCTURES  
WORKING GROUP (IHO-MSDIWG13)  
Hybrid – Singapore, 9 – 13 May 2022**

**(Including joint sessions with the UN Working Group on Marine Geospatial Information and the  
OGC Marine DWG)**

**DRAFT REPORT**

**1. Welcome, introduction of participants, practical information and approval of the agenda.**

*Docs: MSDIWG13-01A List of Documents (Chair)  
MSDIWG13-01B List of Participants (Chair)*

The 13th Meeting of the IHO Marine Spatial Data Infrastructures Working Group (MSDIWG) took place in Hybrid format from 9 to 13 of May 2022 at the Marriott Tang Plaza Hotel in Singapore organized by the Maritime and Port Authority of Singapore. 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). Pearlyn Pang welcomed the participants of the joint meetings to Singapore mentioning that it is great to return to see some participants in-person since the last in-person meeting in Germany two years ago and expressed the expectations about the meetings ahead and the International Seminar. The Chair of the MSDIWG Jens Peter Hartmann welcomed all participants in-person and by VTC enhancing the possibility to meet in-person again. He also thanked the organizers for the organization of this event. Rafael Ponce Co-Chair of the OGC Marine Domain Working Group thanked the organization and expressed the expectations about the outcomes of the meetings and the Seminar. John Nyberg Co-Chair of the UN Working Group on Marine Geospatial Information expressed his satisfaction to be present in-person and have the opportunity to exchange ideas with the other participants. He thanked the organization for the persistence regarding the organization and host this meeting and enhanced that this will be the third joint meeting of these three groups that work together as a team. He expressed the optimism towards the accomplishment of the goals established and encouraged the participants to also continue the discussions during the breaks.

Chief Hydrographer of Singapore MPA, Thai Low, mentioned that it is very glad to be possible to host this meeting in Singapore and thanked all participants in-person and attending by VTC.

The Maritime Port Authority of Singapore then provided some administrative information regarding the side events organized and the safe measures in place.

**2. Approval of the MSDIWG13 Agenda**

*Docs: MSDIWG13-02 Agenda and Timetable (Chair)*

The agenda was presented by the Chair with an explanation about what is expected in each item. The agenda was approved by the participants.

**3. Introduction of new members**

*Doc: MSDIWG13-01C MSDIWG Members and Expert Contributors (Chair)*

The MSDIWG Chair welcomed and introduced the new members since the last MSDIWG Meeting, PP CHAKRABORTY from India, Nicola PIZZEGHELLO from Italy and Telmo Geraldias DIAS from Portugal that presented themselves.

During the meeting in the last day, the MSDIWG also welcomed Yidda HANDAL from Honduras as a new observer of the MSDIWG.

#### **4. Review of action items from MSDIWG12**

*Doc: MSDIWG13-04 Action items from MSDIWG12 (Chair)*

The Chair went through the active actions from the MSDIWG12 and asked comments to update the respective situation. The list was updated with the respective status and the MSDIWG13 Actions and is available on the meeting's webpage.

#### **5. Review the result and feedback from C-5, IRCC13 and HSSC13**

*Doc: MSDIWG13-05 Review the result and feedback from C-5, IRCC13 and HSSC13 (Chair)*

The Chair went through the document MSDIWG13-05 with the actions from the C-5, IRCC13 and HSSC13 relevant to the MSDIWG.

About action C5/08, the IRCC Chair invited the MSDIWG to apply the 9001 Principles in his work, this action is ongoing.

At IRCC13 was a discussed how the MSDIW can liaise with the other relevant subordinate bodies of IRCC and HSSC and since we have common participants with all of them, the liaison is established, but it is necessary to establish a strategy for the involvement. About the DQWG is necessary to increase the liaison as well as with NIPWG noting that the former chair is also a member of the MSDIWG. In relation with the S-100WG, was mentioned the expectation that the Chair participates in the MSDIWG13 Meeting. Regarding the actions from HSSC, the Chair asked the Members to provide inputs if the MSDIWG should try to suggest any prioritization in terms of the S-1XX and s-4XX product specifications. The Chair also mentioned the need to look how MSDIWG can use the CATZOC and POSACC / SOUACC values, related with actions HSSC13/49 and HSSC13/50 something that is important from an MSDI perspective.

**Action 01/2022 - Nominate appoint contact points from Data Quality WG, NIPWG and S100WG to report back to MSDIWG on relevant MSDI matters. (S100WG – OGC Marine DWG/IIC Technologies) [deadline: MSDIWG14]**

#### **6. Setting goals for the MSDIWG meeting**

*Doc: MSDIWG13-06 Setting goals for the MSDIWG (Chair)*

The Chair informed the meeting on what, in his opinion, should be the goals for the MSDIWG13 meeting enhancing the following points:

- The update of C-17.
- The IHO strategy from a MSDI perspective including SPI and the ISO principles to allow the preparation of the Report to IRCC14.

- Cooperation with relevant IHO WG, S-100 and the implementation plan from a MSDI perspective.
- S-100 Development and Showcase from a MSDI and MSP perspective.
- Expectations and cooperation with the WENDWG from a MSDI perspective.
- The FAIR principles, that is necessary to follow but is necessary to investigate what are the FAIR principles from an HO perspective and if the WG wants to create a FAIR principles check list.
- The exchange of knowledge/presentations from national MS and expert contributors is one of the MSDIWG highest challenge.
- UN Decade of Ocean Science for Sustainable Development
- The Future cooperation with Singapore-IHO Innovation and Technology Laboratory.
- IHO Crowdsourced Bathymetry, DCDB and GEBCO Seabed 2030.
- IGIF-MSDI Maturity.
- Future geospatial information ecosystem, what's next? 3, 5, 7 years vision?
- Security and integrity from a MSDI perspective.

The MSDIWG Chair asked the Members to provide additional inputs to the goals.

## **7. Short review of the MSDIWG work programme**

*Doc: MSDIWG13-07 Short review of the MSDIWG work programme (Chair)*

The Chair left this topic for agenda item 31.

## **8. National presentation from members on status of MSDI and MSP**

*Docs: MSDIWG13-08A National Report - USA*  
*MSDIWG13-08B National Report - Denmark*  
*MSDIWG13-08C National Report - Portugal*  
*MSDIWG13-08D National Report - United Kingdom*  
*MSDIWG13-08E National Report - Singapore*  
*MSDIWG13-08F National Report - Republic of Korea*  
*MSDIWG13-08G National Report - Indonesia*

### **National Report - USA**

Caitlin JOHNSON presented the Report from USA starting with the Policy and Governance mentioning the continuously engagement with the IHO, UN and OGC levels and the regional IHO Hydrographic Commissions, supporting the IHO-OGC Marine Spatial Data Infrastructure Concept Development Study and the Federated MSDI Pilot. She mentioned the most important policies and legislation that is led by NOAA at the US. Regarding the information systems, US started to implement a data centric approach to replace the products centered one. They are trying to use OGC standards and the FAIR principles when possible. Regarding the Geographic content she mentioned some projects such as the NGA GEOINT Services with Digital Elevation Models (DEMs), the National SDI, the Marine Cadastre and the Global Maritime Traffic Density Service (GMTDS), explaining the respective objectives.

### **National Report - Denmark**

Jens Peter HARTMANN explained the evolution of the Danish MSDI which allows users to visualize and use marine data from Danish marine authorities. Actually 110 marine data sets are available in areas as: infrastructure, planning, restriction zones, nature, bathymetric data, administrative borders, recreational information etc. The Danish governance model was introduced, and the intention is to allow access to free data, but the users will need to pay to have some data. About the new MSP mentioned that instead of having only updated data was decided to also maintain the historical data. They have plans to develop a user-friendly platform and that was approved by the government. The vision to improve was explained as well as the challenges faced such as the financial model for the future developments.

Pearlyn Pang asked how the model is developed in relation with the Nautical Charts, being explained that the price of charts reflects part of the cost of the data but also the government participate.

### **National Report - Portugal**

Telmo Dias provided the presentation starting by the vision about the diverse types of marine data that is aligned with the FAIR principles. He also mentioned the Mission regarding the marine data and the respective model with the data source, the multiple formats for interoperability and the extend use of the data, being focused on the use of hydrographic data for the benefit of the society. The Hydrographic Plus MSDI was introduced being a project in development that will integrate three main usage interfaces GeoPortal H+, the Web portal AnavNet and the mobile AppH+. The main architecture with the data stored in spatial databases following the principles on the Interoperability, modularity and scalability was explained. The IHPT is about to launch a web Portal where it will be possible to download bathymetric data from grids with different resolution from the SEAMAP2030 national project.

### **National Report - United Kingdom**

Helen Phillips described the UKHO Data principles based on the way they want to manage the data: value, safeguard, easy to use and fit the purpose. The best practices in a wider concept were also communicated and the respective Guidelines related with the safeguarding, the management of the data assets, the sharing and transferring of data and the usage and exploitation. UKHO aligned the data governance with their vision. Developed roles into different groups and was explained how the groups work together. She enhanced the data Governance Challenges and the framework as well as the main areas where the challenges are faced. The Marine data portal replaced the INSPIRE portal that allows not only to serve data but also provides a platform for future data provision and value-added services.

Chair asked how they chosen the data principles and was explained that they were based on the FAIR principles and the community inputs and on what they feel about the community needs. Regarding the financial model, not all data sets are free. About the fit for proposes and the marine geologists and what is the level of selected data sets it was mentioned that this is a challenge for the future.

### **National Report - Singapore**

Pearlyn Pang presented the GeoSpace-sea Singapore's MSDI Strategic Direction with a group of institutions that is chaired by MPA and is dived in two WG's the GeoSpace-Sea Application & Research Working Group and the Geospatial Data Management Working Group.

In relation with the maturity of the GeoSpace-Sea, they are increasing the partnerships and data resources and expanding the users and enhancing the portal. Currently a survey is being running to ask the users what their needs are. She enhanced the respective application and research and the development of data guidelines for different applications. Two examples of use-cases were mentioned, the Active Anchorage Management System and the Coastal In-land Flood Model. In relation with the future, the next planned steps are the increase of the partnerships and collaborations, the operational sustainability, the enhancement and the FAIR principles.

Chair asked about the financial model that has the concrete definition in an ongoing process.

### **National Report - Republic of Korea**

Presented on behalf of KHOA starting with the transformation on the marine geospatial data collection and management to be a Maritime Information Utilization Center and have an added value with a more efficient management of the data and to better meet the user needs. The 5 years roadmap was presented to be completed by 2025. The steps executed in 2021 and the ones planned for 2022 were explained.

### **National Report - Indonesia**

CDR Sutrianto introduced the Indonesia Portal (IHDC) and explained the organization of data in the IHDC mentioned the different areas such as the E-navigation, the 3D Bathymetry, the interactive Sailing chart, the hydrographic education, etc. He described the National Marine Development that contains data from the ENCs and tide data that is on the website, in real time available for the users. More examples of data are available on-line such as the data from the Ports, the information from the Radio Stations, the information about the submarine cables and MSI. Some data is available to the public and some is shared only with the navy. The Portal also allows data overlay by the users. In the future is planned to integrate data about the vessels traffic as well as oceanographic and meteorological data.

Action 02/2022 - Compile list of relevant S-1xx products point of contacts. [deadline: MSDIWG14]

Action 03/2022 - MSDIWG to identify the S-1xx products that could be relevant for MSDI users. [deadline: MSDIWG14]

## **9. RHC presentation from RHC MSDIWG**

<i>Docs: MSDIWG13-09A</i>	<i>Regional Report - Baltic Sea and North Sea Hydrographic Commissions</i>
<i>MSDIWG13-09B</i>	<i>Regional Report - Arctic Hydrographic Commission</i>
<i>MSDIWG13-09C</i>	<i>Regional Report - Eastern Atlantic Hydrographic Commission</i>
<i>MSDIWG13-09D</i>	<i>Regional Report - South-West Pacific Hydrographic Commission</i>

### **Regional Report - Baltic Sea and North Sea Hydrographic Commissions**

Jens Peter Hartmann mentioned the physical meetings they had and the respective focus of the national presentations such as: the S-1XX products, the FAIR Principles and on MSP. The Meeting was informed on the workplan and that they decided to have intermediate VTC meetings and physical meetings every 2 years depending on the situation. The plan of the topics for future meetings are: UN-GGIM IGIF Hydro, Singapore – IHO Innovation Lab and the MSP. A project executed together with the OGC related with the

S-100 test bed and S-122, with the possibility to have MSP in S-122 and how to convert the data. The region also had an approach to the EU technical Expert Group on data to MSP. Other initiative is the Community of Practice (CoP), data sharing, information and communication technology serving MSP. All members of the Baltic Sea and North Sea Marine Spatial Data Infrastructures Working Group have been invited to participate in the CoP.

### **Regional Report - Arctic Hydrographic Commission**

Caitlin JOHNSON mentioned the meetings of the ARM SDI WG and the respective highlights explaining the cooperation within the Arctic SDI and the Federated Marine SDI-Pilot organized by OGC and that is an excellent opportunity for collaboration of stakeholders across the marine domain. Regarding the Arctic Voyage Planning Guide (AVPG), only 21% of the AVPG Datasets are available and no single theme is fully available. So, today the necessary data still not available. She concluded mentioning that ARMSDI has achieved several milestones, but users still do not currently have a central or common way to find authoritative Arctic marine spatial data from ARHC's HO's, nor do they have a total set (i.e. gaps in coverage) of usable web services available to them for the majority of themes they have asked for in various studies and surveys.

### **Regional Report - Eastern Atlantic Hydrographic Commission**

LCDR Telmo Dias reported that was decided to establish an MSDIWG within the Region on the regional meeting in last September. There are now 8 members (France, Ghana, Morocco, Nigeria, Portugal (chair), Spain, UK and Gambia) and they are developing the TOR, the list of actions and some proposals. He explained the current list of actions that is expected to be completed on next September.

### **Regional Report - South-West Pacific Hydrographic Commission**

Helen Phillips mentioned the purpose to promote the sustainable development and use of the oceans, seas and inland waters in line with the United Nations Sustainable Development Goals based on the 9 Strategic Pathways from the United Nations Global Geospatial Information Management, Integrated Geospatial Information Framework (UN-GGIM IGIF). They tried to increase the participation from the members of other organizations and other nations.

The activities were primarily focused on the information sharing, they updated the information on the list of SDI portals. The top priorities are: Adoption and implementation of UN GGIM-IGIF-H MSDIWG; Engage with regional organisations to encourage Coastal States to share data within the region and adopt open data policies; And, collaborate with regional bodies and coastal states to develop and promote a "data value proposition" and share within the region.

**Action 04/2022 - SWPHC MSDI WG to update terms of reference on making data in line with the UN SDG goals and UN Shared Principles. [deadline: MSDIWG14]**

## **10. Presentation from stakeholders**

*Docs: MSDIWG13-10A1 Crowd Sourced Bathymetry  
MSDIWG13-10A2 Seabed 2030*

## **Seabed 2030**

Seabed 2030 Director, Jamie McMichael-Phillips started giving an overview on the history of the project. Then he provided an update on the Seabed 2030 project on the Work Package (WP) 1 related with the data. Mentioned the progress so far from the 6% on the beginning of the project to the actual 20,6% (June 2021) and the almost 4/5 of the area that still to be mapped. Regarding the WP2 - Systems and tools, was mentioned the improvements at the Centers, the development of the statistics routines, the scripts and grids improvements as well as the refinement of the App for visualization. On the WP3 – Tech Innovation, enhanced the Tech Strategy White Paper in preparation, the Grid Stats improvements, and the refined/demo new-generation CSB loggers. He also described the Mapping activities on WP4 related with the Ocean Frontier mapping project, the CSB, the SDB and the Fugro transit bathymetric information. In relation with the Management (WP5) was mentioned the Head of Partnership & Head of Communications recruitment, the Wind-in-the-Sails Survey and global prioritisation work, the OFM Bid from Dec 21 to Nov 22 submitted and approved, the most recent MOU's as well as the engagement with a wider community and several significant events.

## **Crowd Sourced Bathymetry WG Report**

Jens Peter Hartmann mentioned that IHO Data Centre for Digital Bathymetry (DCDB) build a data pipeline that allows the public to contribute, discover and download CSB data via a web-based map viewer interface presented. He mentioned the value of the CSB data and the benefit for the MSDIWG. About the values of the CSB data he mentioned that is data with scientific, commercial & research value at no cost to the public as well as to other purposes, for instance the CHS use some CSB to update some nautical charts. The importance to respond to IHO CL 11/2019 was enhanced as well as the legal problem that several HOs face to share the data, referring that is necessary to help the CSB to find what could be the solution to some different countries. He also called the attention to the importance to join and participate in the CSB meetings.

Action 05/2022 - MSDIWG and UNGGIM WG MGI to work together to identify common use-cases for bathymetry data residing in DCDB and Seabed 2030. (MSDIWG and UN-GGI WG MGI) [deadline: MSDIWG15]

Action 06/2022 - MSDIWG to identify use-cases of crowdsource bathymetry. (MSDIWG) [deadline: MSDIWG14]

## **IHO E-Learning Center**

Helber Carvalho Chair of the IHO e-Learning Center Project Team provided a presentation explained that the main goal of the Center is to support the IHO community with e-Learning opportunities and to expand capacity building activities. The objectives are related with the implementation of an e-Learning Center that can provide training opportunities using e-learning processes to contribute to the increase of the hydrographic capability. He mentioned the membership and the meetings they had so far and the achievements as well as the activities executed, enhancing the 4 courses already available in the e-Learning Center and the fact that in 2022 they intend to proceed with the phase tests of the Center. The structure of the LMS was also described. The possibility to translate the material to Spanish and French

that is a possibility in consideration. Other challenge will be the update of the material on the e-Learning Center that is a process in continuous consideration.

Peter Hank provided the presentation of the e-Learning Center mentioned that MSDI is the group that provides more contents to the Center. Then he went through the menus of the Center showing the four courses available and mentioned the different kinds of courses that could be available like the Open, the Regular, the Certified and the Special courses. The system allows to have different languages for the same course in terms of sounds and subtitles, but the developers of the courses or other institutions should provide the respective translations.

Action 07/2022 - MSDIWG to test the MSDI Training Materials on the IHO e-learning portal (<https://elearning.iho.int>). (MSDIWG) [deadline: MSDIWG14]

## **IHO LAB**

Lee Weng Choy mentioned that the official Launch of the IHO-Singapore Innovation and Technology Laboratory was in Singapore on 26 October 2021. He reported on the improvements to facilitate the presentation of proposals and on the future work programme that includes the first 2 projects: S-57 to S-101 Conversion; and, S-131 on Marine Harbour Infrastructure Database. A new potential project is to create a test-bed S-100 ECDIS capable of displaying S-101 and S-102 datasets.

The MSDIWG Chair mentioned that would like to discuss on Friday eventual proposals from the MSDIWG to the IHO Lab.

## **12. UKHO IGIF-MSDI Maturity Roadmap**

Trevor Taylor from OGC started to mention the four pillars of the MSDI (C-17) and the nine pathways of the UN-GGIM IGIF. They try to figure out where the organizations will fit in UN GGIM, what are the connections and the disconnections, the IHO, the OGC the World Bank and Governmental agencies. This IGIF-MSDI Maturity Roadmap is intended to provide guidance for those within Governmental departments or agencies that are actively planning an MSDI implementation, which is aligned with the broader IGIF to assist in circumstances where familiarity is not at a level sufficient for enabling to pursue an IGIF-MSDI transformation programme. Then he explained the Why, What and HOW and that the World Bank has an SDI diagnostic tool. The methodology was explained and the contributes from each organization. He also mentioned the pathway and balance between governance and technology and summarized to who is addressed and why is necessary. The design is based on the World Bank IGIF methodology with the IHO and OGC contribution and aims to have a language that be understand by non-technical people.

The MSDIWG Chair offered to present the project at the next IRCC meeting and ask the participation from some MS.

## **13. OGC Marine Domain WG with relevance for the MSDIWG**

Jonathan Pritchard summarized the challenges identified in an OGC meeting some time ago, such as: the interoperability and discoverability, the datum harmonization in particular the vertical, the management and manipulation of temporal data, the governance and policy for data sharing as well as the storage and handling for variable resolution. He concluded that most of those challenges still actual. The OGC



priorities are now: the findability, the land and sea integration, the technology solutions and the authenticity and provenance. He enhanced the importance of the interoperability and the use of standards for maximum reuse. The IHO/OGC recipe book for use cases was mentioned and that the MSDIWG and UN\_GGIM provides the “why” and the integrated “how”, and the IHO/OGC provides the technical “how”. He mentioned the OGC Federated MSDI Baltic use case phase with the subject being the "Marine Protected areas" from an MSDI perspective and the respective aims that includes the examination of the S-122 for broader use cases, the S-122 encoded MPA data via OGC API and propose outputs for both IHO and OGC to enable better interoperability. For him, the core question is whether the S-122 need enhancement or if should be necessary an MSP product specification that includes MPAs with other elements. He also explained the OGC API Model and the fact that the use of the API changes the model bringing authenticity and identifying the provenance, the data is aggregated, the data exchange use a common model, etc. He explained the OGC update on IGIF-Hydro and the need to have a simplification of the content and the question about if the themes should be more used.

The MSDIWG Chair asked if it will be possible to write guidelines on how the HO's can use the mentioned API and also enhanced the need to develop show cases to show the users how to do it. Trevor Taylor mentioned that how to convert data is one of the reasons that brings the organizations here. The Chair mentioned that when the Danish HO join the project the premiss was that the demonstrations should be available to all IHO MS and also the existence of an OGC e-Learning platform with an introduction to the API platforms.

Jens Schröder-Fürstenberg asked which will be the actions in relation with the S-122 enhancement or a new product, Jonathan Pritchard mentioned that this still in evaluation. Trevor Taylor mentioned that the way that the OGC pilot are structured would not end with an operational product but will bring possible ways to solve a problem.

Action 08/2022 - OGC to provide guideline or Recipe Book and showcase(s) for Hydrographic Offices to implement OGC APIs. (OGC Marine DWG) [deadline: MSDIWG14]

Action 09/2022 - OGC API - Feature Link to be made available to Body of Knowledge. (OGC Marine DWG) [deadline: MSDIWG14]

Action 10/2022 - OGC to provide presentation on OGC APIs for MSDIs at MSDIWG14. (OGC Marine DWG) [deadline: MSDIWG14]

Action 11/2022 - OGC to share links to latest OGC APIs for dissemination to MSDIWG. (OGC Marine DWG, IHO Secretariat) [deadline: MSDIWG14]

#### **14. Land/sea interface and coastal zones**

XXX

#### **15. Authoritative data, authority and custodianship**

XXX

#### **16. Marine Geospatial Information in relation to the UN Sustainable Development Goals**

XXX

#### **17. Any other topics arising from Day 1 of Meetings**

XXX

## 18. Any other business

XXX

## 19. Discussion about the FAIR principles, challenges and possibilities

The MSDIWG Chair provided a presentation on the FAIR data principles (Findable, Accessible, Interoperable, Re-usable) mentioning that on the internet there are lots of different definitions of the principles. He described the different ways how to be compliant and proposed to develop a check list for the Member States to help them in evaluating if they have the same frame. He asked if OGC can present such a proposal of checklist in the next joint meeting. The meeting discussed on the best way to have common definitions and OGC will lead this work involving some Members.

Action 12/2022 - OGC to provide draft guidance on how to follow the FAIR principles from HO perspective. (OGC Marine DWG) [deadline: MSDIWG14]

Action 13/2022 - MSDIWG to follow-up on IRCC14's outcomes of the IRCC Workshop and suggest how MSDIWG could contribute to SPI 2.3.1. (MSDIWG Vice-Chair) [deadline: MSDIWG14]

Action 14/2022 - MSDIWG to explore practical approach or best practices on principles for MSDIs. (MSDIWG Vice-Chair) [deadline: MSDIWG14]

Action 15/2022 - MSDIWG to include proposed FAIR principles checklist to be included in report. (OGC Marine DWG) [deadline: MSDIWG14]

## 20. UN-GGIM Statement of Shared Guiding Principles for Geospatial Information Management and FAIR Principles

OGC Meeting.

## 21. Other business and next meeting

OGC Meeting.

Joint session - Third expert meeting of the United Nations Working Group on Marine Geospatial Information, **Thirteenth meeting of the Marine Spatial Data Infrastructure Working Group of the International Hydrographic Organization**, and Annual meeting of the Marine Domain Working Group of the Open Geospatial Consortium

## 22. Review of the outcomes of the International seminar

Pearlyn Pang presented the UN GGIM outcomes of the seminar and asked for comments or questions on the seminar. Jonathan Pritchard asked what will happen after and John Nyberg explained that will be a part of the UN GGIM MGI Minutes. More information related with the seminar and the respective documents can be found at:

<https://ggim.un.org/meetings/2022/3rd-WG-MGI>

### **23. Availability and accessibility of marine geospatial information for a multiplicity of purposes and the benefits of society, environment and economy**

XXX

### **24. Integration of maritime, terrestrial and cadastral domains**

XXX

### **25. Operational Framework for Integrated Marine Geospatial Information (IGIF-H)**

The participants presented themselves to be divided in groups to discuss the parts of the document IGIF-H - Operational Framework for Integrated Marine Geospatial Information Management. The groups discussed the chapters on the strategic pathway of IGIF-H and provided contributes that were then shared with the meeting. It was also clarified that will be possible and desirable to receive later additional contributes.

### **26. Updating C-17**

The meeting discussed the review of the C-17 to align it with other IHO publications and possible alignment with UN-GGIM IGIF Water and IGIF Hydro. Pearlyn Pang reminded the recommendations from MSDIWG11 to review C-17 in depth and align it with other IHO publications and that the content should reference other related valuable information such as the training material, the Body of Knowledge, the OGC Concept Development Study and the IHO Strategic Plan. The format should also be evaluated to make it easy to be updated and maintain and should include sections on the FAIR principles and S-100. She recommended the establishment of a small drafting group that was approved by the meeting. The Chair mentioned the long time that the approbation process took last time and mentioned the need to verify the possibility to create a C-17 Wiki or an online version that could have a faster approval process. Pearlyn Pang also mentioned the need to include eventually other information that can be important from an HO perspective and asked the members to provide information about other additional contents.

Action 16/2022 - MSDIWG to establish a C-17 Drafting Team (Vice-Chair, USA and Italy) [deadline: August 2022]

Action 17/2022 - C-17 Drafting Team to provide a first version at MSDIWG14 (Vice-Chair, USA and Italy) [deadline: MSDIWG14]

### **27. Future geospatial information ecosystem**

Jens Peter Hartmann provided a presentation on the future geospatial information ecosystem and the marine digital Twins that “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”. He considered important to think on how the MSDIWG can approach this topic that has a lot of different definitions on the internet. Several different actors can be involved and interested in the marine digital twins, so he proposes the MSDIWG to work together with OGC. He mentioned the EU

Digital twin of the ocean and how it is defined as well as the pdf document published to explain “what is it” and how it works and who can benefit.

He raised some questions to the audience: what is a Digital twin from a MSDI perspective, if it is relevant from an HO perspective? The meeting was asked if the MSDIWG should investigate more the maritime digital twins and consider if it could be something that the IHO Lab could look at it. Trevor Taylor mentioned that consider the use case in Singapore crossing the land and water will be a good way to advance on the Digital Twins and to explore this topic. Rafael Ponce clarified that from an industry perspective Digital Twins are nothing new since it is only a digital representation of something from the real world so he recommended not to be too much lost on different definitions. John Nyberg mentioned the need to investigate what is the appetizer from the MS to be involved in the Digital Twins. Jens Peter mentioned that several HO have different maturity levels and proposed to put an action item to investigate how the MSDIWG should proceed in relation with the Digital Twin and create a PT approach this topic and the meeting agreed with this approach.

**Action 18/2022 - MSDIWG to investigate the role of MSDI in Maritime Digital Twin, how to proceed and the possibility to establish a pilot project together with the IHO-Singapore Innovation and Technology Laboratory with Singapore as a pilot study area. Input paper to be provided in MSDIWG14. (Chair, Vice-Chair, Netherlands, IHO-Lab and OGC Marine DWG) [deadline: MSDIWG14]**

## **28. WEND-100 from a MSDI approach**

John Nyberg WENDWG Chair reported on the work developed in the WEND related with the metrics that wanted to share with the RHC's and that are related with S-101 but can and should be applied to the other products. A WEND Product Matrix-test was developed but it is in early stage and it is based on a questionnaire that should provide information on in which stage these products stand. Each area will have a score and the idea is in the end to have an overall score. IRCC will have a recommendation to appoint an S-100 coordinator that might be in some RHC the Regional Chart coordinator.

Jens Peter commented on the need to ensure the consistency on the different things and proposed to have an action, that was approved, for the WENDWG to send the metrics to MSDI when they are mature to receive contributes from the MSDIWG. Australia asked the relation with the OGC maturity assessment, John N mentioned that this is more focused on the products and is a quick measurement.

**Action 19/2022 - MSDIWG to provide feedback on WENDWG's WEND Product Matrix from MSDI perspective when deemed appropriate. (WEND Chair and IHO Secretariat) [deadline: MSDIWG14]**

## **29. S-100 Development and Showcase from a MSDI and MSP perspective**

The MSDIWG Chair presented on the OGC FMSDI S-122 project about MSP and MPA what was done on the Baltic and North Sea as a S-100 testbed. It was decided to investigate if it possible to download and convert MSP data to S-122 and also was stated the collaboration with other institutions that have MPA such as the OSPAR. A questionnaire was sent to ask which institutions have S-122 data available and only German and the Danish Institute had this information available. He mentioned the workshop meetings with the HOs where was discussed the S-122 scope, if the MPA and restricted areas are enough and the gaps in the attribution of the core features to highlight to HSSC. The Regions also

realized that there are different definitions about what is an MPA. He mentioned that will be necessary to work a little bit more on this project. A link to the GIS system was also made available.

Jonathan Pritchard presented the OGC FMSDI Baltic use case phase related with the Marine Protected Areas and the applicability of the IHO S-122 for broader use cases and the feasibility of S-122 encoded MPA data in the region via the OGC API and the technical challenges to do it. OGC also tried to realize how the API enabling of data affects producers and stakeholders. This was a prototype using S-100 and OGC web services in a broad context. Some suggestions for improvement were produced such as: multiple identifiers with schemes, richer descriptions of designations, measurements marine plans, etc. It is not only the HOs that have MPAs. He concluded mentioning that there aren't significant barriers to development, this process can be reused for other product specifications, some areas for growth in the IHO and OGC Standards were identified, and the impacts need to be better defined. The MSDIWG Chair enhanced that the report will be available in June.

Action 20/2022 - OGC FMSDI S-122 Engineering Report to be made available to the MSDIWG when made public. (MSDIWG Chair and OGC) [deadline: August 2022]

Action 21/2022 - OGC FMSDI S-122 Engineering Report to be made available to the MSDIWG when made public. (MSDIWG Chair and OGC) [deadline: August 2022]

### **30. IHO strategic plan and Marine Spatial Data Infrastructures (MSDI) questionnaire CL.**

The MSDIWG Chair provided a presentation about the IHO Strategic Plan introducing the Goal 2 that is “increasing the use of hydrographic data for the benefit of society” and the Target SPI 2.1 to “Build a portal to support and promote regional and international cooperation in marine spatial data infrastructures (MSDI)”. The new actions will be to set a questionnaire to send to the MS and explained that this is aligned with the intentions of the IHO Secretariat. He provided some examples of contents and used the C-55 as an example as well as the S-122, adequately survey coverage and other examples. IRCC asked the MSDIWG to apply to the ISO9001 principles in his work. The fact that a questionnaire will be sent is a way to be engaged with the users as well as the discussion in this meeting and also if some members have additional ideas on how to implement the ISO9001 principles will be very welcome.

The concept approach for the Portal was presented as well as some examples of initial contents that are:

- S-122 MPA
- IHO Membership (IHO secretariat)
- INT Chart coverage (RHC)
- ENC coverage (RENC)
- Global CATZOC dataset (RENC)
- Global AIS dataset (US)
- C-55 content (IHO secretariat)
- Global MSI Navarea layout t.b.d. (IHO secretariat)
- S-100 showcases / best practices (MS)
- SCUFN Gazetteer
- DCDB Map Viewer
- Global Bathymetry (GEBCO Grid)

This suggestion will require a minimum of resources and can relatively easily be implemented by the IHO Secretariat.

A questionnaire to be sent to the MS will be proposed to IRCC14 to be issued by the IHO Secretariat.

Jens Schröder-Fürstenberg mentioned that the data is already available in the INTOGIS so the real purpose is not clear and is necessary to define what already exists and what is necessary to prepare. The MSDIWG Chair mentioned that everything is combined in just one portal and the workload is not intensive for the MSDIWG. Australia mentioned that a single portal creates a lot a discussion among the SWPHC MSDI, mentioned that different portals are already available and that they would like to have information about the countries in the region. Rafael Ponce mentioned that this will repeat some of the catalogs available in the IHO website, so he suggested to create a data HUB network instead. John Nyberg enhanced that the WG is just trying to comply with the IHO Strategic Plan. Jens Peter H. mentioned the possibility to set a workshop to discuss this issue. Jens Schröder-Fürstenberg mentioned that liked the idea of setting an environmental that put the responsibility of the update on the contributors. Jens Peter H. mentioned that to have an HUB is necessary to have the funds to develop and to maintain it. Rafael Ponce mentioned that can present a pilot as an example were the contributors can provide the information. Helen Philips enhanced the need to look at this with the nine IGIF pathways since such a portal is not only about technology.

Jens Peter H. proposed to start with the data available and then the MSDIWG will have more time to evaluate the possibility to establish and maintain a HUB were the MS can maintain their data and proposed to have an online workshop to discuss it.

Chee Hai Teo mentioned that at UN GGIM they are promoting a concept with federated information that in is view is beyond a portal, SGD data Hub Network where the organizations have the responsibility to make the data available and updated. The technology is available and suggested to take a look at this. Jens Peter H. mentioned that non all MS participate in the activities, and how the UN GGIM guarantee that all states contribute. Chee Hai Teo mentioned that they urge the members to contribute and participate. The MSDIWG Chair mentioned that will provide to IRCC the recommendation to this in two steps, first the simple solution and then start to work in the evaluation of a the most complex solution, the HUB. Rafael Ponce informed that will provide some information on a possible solution for a HUB.

Action 22/2022 - An expert group to explore MSDIWG's task related to Target 2.1 Build a portal to support and promote regional and international cooperation in marine spatial data infrastructures (MSDI). Step 1: Make data that is already available into INTOGIS and Step 2: establish a hub. (MSDIWG Chair, Vice-Chair and ESRI) [deadline MSDIWG14]

Action 23/2022 - Recommendation for Step 2: establish a hub, to be submitted at MSDIWG14. (ESRI) [deadline MSDIWG15]

Action 24/2022 - An online workshop to be convened to further discuss Step 2: establish a hub for Target 2.1 Build a portal to support and promote regional and international cooperation in marine spatial data infrastructures (MSDI). (MSDIWG Chair, Vice-Chair and ESRI) [deadline MSDIWG15]

### **31. Updating the MSDIWG work plan and action list, with a possible long cast view**

The meeting went then through the list of actions with the new actions for the MSDIWG13.

### **32. Drafting the MSDIWG13 Report to IRCC14**

XXX

### **33. Content of next MSDIWG14, OGC Marine DWG and UN-GGIM WGMG Meetings**

XXX

### **34. Future meetings**

In relation with the future meetings, it was decided that the next MSDIWG meeting will be also a join meeting with UN Working Group on Marine Geospatial Information and the OGC Marine DWG meetings.

The MSDIWG Chair announced that Italy offered to host the MSDIWG14 and Indonesia offered to host the MSDIWG15 in 2024. The dates and venues of the next meetings were then announced to the meeting:

- MSDIWG14 (2023) - Genoa, Italy from 30 January - 3 February
- MSDIWG15 (2024) - Indonesia (TBD Jan/Feb)

Action 25/2022 - Hosting the MSDIWG14 and coordination with the UN-GGIM Working Group on Marine Geospatial Information and OGC Marine DWG on back-to-back meetings. (IHO Secretariat, MSDIWG Chair, MSDIWG Vice-Chair and Italy) [deadline MSDIWG14]

Action 26/2022 - Hosting the MSDIWG15 and coordination with the UN-GGIM Working Group on Marine Geospatial Information and OGC Marine DWG on back-to-back meetings. (IHO Secretariat, MSDIWG Chair, MSDIWG Vice-Chair and Indonesia) [deadline MSDIWG15]

### **Closing**

The MSDIWG Chair thanked all participants and MPA Singapore for the excellent organization, the Vice-Chair and the IHO Secretariat for the collaboration and the work.