ONLINE 12th MEETING OF THE IHO MARINE SPATIAL DATA INFRASTRUCTURES WORKING GROUP (IHO-MSDIWG12on)
VTC, 17 and 18 March 2021

DRAFT REPORT

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

Docs: MSDIWG12on-01A   List of Documents (Chair)
*   MSDIWG12on-01B   List of Participants (Chair)*
*   MSDIWG12on-01C   MSDIWG Members and Expert Contributors (Chair)*
*   MSDIWG12on-01D   Agenda and Timetable (Chair)*
*   MSDIWG12on-01F   ToR and RoP (Chair)*

The Online part of the 12th Meeting of the IHO Marine Spatial Data Infrastructures Working Group (MSDIWG) took place via VTC from 17 to 18 of March 2021. The meeting was opened by the Chair of the MSDIWG Mr Jens Peter Hartmann and by the IHO Director Luigi Sinapi.

Chair welcomed the participants and expressed his satisfaction for the great participation and also welcomed the IHO Director Luigi Sinapi and the Secretary Mr. Leonel Manteigas for their first participation. Chair expressed his disappointment for not having a face-to-face meeting but highlighted the need to convene this meeting to prepare a new Draft work plan2021-2024 to be presented at the next IRCC13 Meeting in June. Because this format implies time limitations, it will be necessary to only focus on the most important items having in consideration that it is expected to have a face to face meeting in Singapore in October.

IHO Director Sinapi welcomed the participants and mentioned the importance of maintaining these virtual meetings but hoping that we can restart the face to face meetings soon. He added that A-2 approved a new IHO Strategic Plan, where GOAL 2, and specifically Target 2.3, mentions how important it is for MSDIs to share the UN guiding principles for geospatial information management in order to ensure interoperability and combination with other marine-related data. He also elaborated the importance of the active involvement with the RHCs, to ensure the link between the two levels of Spatial Data Infrastructure, the global one under the UNGGIM principles, and the National one, by creating that Regional SDI level.

The Secretary provided some administrative instruction for this meeting and stated that only one candidate for the position of Chair and another for the position of Vice-Chair were received.

The Agenda was presented with an explanation about what is expected in each point and was approved by the participants.

2.   Introduction to the IHO MSDI Online meeting 2021

Docs: MSDIWG12on-02A   Action Items from MSDIWG11 (Chair)
*   MSDIWG12on-02B   MSDIWG Work Programme 2018-2021 (Chair)*
*   MSDIWG12on-02C   Decisions of the 2nd IHO Assembly (Chair)*
*   MSDIWG12on-02D   Summary Report of the 4th Council (Chair)*
*   MSDIWG12on-02E   IHO Strategic Plan 2021-2026(Chair)*

   a. Aim of the meeting Expected achievements and Expected achievements
       The Chair explained the aim of the meeting and that the meeting will focus on:

       -   Status and presentations from Internal and External stakeholders

- IHO MSDIWG Draft Work plan 2021 - 2024 and Action list
- Presentations from OGC MDWG, OGC pilot, UN-GGIM MWG and UN-GGIM IGIF
- Information about IHO-Singapore Innovation and Technology Laboratory. How could the MSDI community be involved in the the IHO - laboratory and provide some ideas
- Presentation about the use of S-100 with relation to MSDI/MSP, where is expected to have an important debate on the S-100
- Election of new Chair and Vice Chair

   b. Status of Action list and Work program

   In relation to the work program 2018-2021, most of the work items were achieved but there remained some that the meeting needed to discuss in relation with what should be done, if is necessary to adjust them and also if the members and the experts assigned still maintained. The participants were asked to go through the items in order to discuss the new Work program 2021-2024 on the second day. The Group should start to plan the next meeting and receive proposals to host the next meetings.

   In relation to the List of Actions items, it was proposed not to discuss all in meeting and on the second day go through the Actions and then give 3 weeks to the members to provide inputs. Most of the Actions have as deadline the MSDIWG12, the meeting that is expected to have in October in Singapore.

   Some information on the Book of Knowledge was provided and any other necessary additional material can be provided by the interested participants and Members.

3.   Status on the MSDI work of IHO (MSDIWG)

   The Chair, in relation to the 2nd Session of the IHO Assembly, mentioned the importance of the approved IHO Strategic Plan 2021-26, the three Strategic Performance Indicators for the MSDIWG, the 2.1 and 2.3 of Goal 2 and 3.1 of Goal 3, and the fact that the Group need to focus on them. In relation to the SPI 3.1, the need to start discussions with UN GGIM and OGC was mentioned, especially now that we have each time more on-line meetings and a focus on the E-learning materials.

   In relation to the 4th meeting of the Council was the need to focus on evaluating how the MSDI WG can collaborate with the joint IHO-Singapore Innovation and Technology Laboratory as well as the IHO E-learning Center with the E-learning material. Hence, some members will participate in the next meeting of the CBSC E-learning Project Team.

   S. Carisio provided an update on the new documents available on the Body of Knowledge (BoK) and the intention to make a section for Case studies. The US Geospatial Data Act of 2018 was also to be made available to enhance the BoK.

   The Chair thanked and asked the audience if someone has more documents that could be made available on the BoK, to send it in and to allow its use and sharing.

4.   National presentation from members on the status of MSDI

Docs: MSDIWG12on-04A   *National Report - Brazil*
          MSDIWG12on-04B   *National Report - Canada*
          MSDIWG12on-04C   *National Report - Denmark*
          MSDIWG12on-04D   *National Report - Netherlands*
          MSDIWG12on-04E   *National Report - New Zealand*
          MSDIWG12on-04F   *National Report - Norway*
          MSDIWG12on-04G   *National Report - Republic of Korea*

MSDIWG12on-04H   National Report - Singapore
MSDIWG12on-04I   National Report - Spain
MSDIWG12on-04J   National Report - USA
MSDIWG12on-04K   Regional Report - Baltic and North Sea

a. Brazil National Report

Christopher F. from Brazil presented the National report and highlighted that they had to adapt to the COVID pandemic. The number of requests for data increased in the last years. He also reported on the metadata uploaded in the GeoPortal that has already 7 layers. In relation to the challenges, he mentioned the need to develop and implement a map viewer with more capabilities to interact with marine spatial data and to strengthen the national maritime identity. It was also expressed the intention to collaborate with the UN GGIM WGMGI and the IHO MSDIWG in especial with the initiatives related with South America as well as some National institutions. In relation to the reason for the increase of requests was explained that they did not have conclusive reasons, so far.

b. Denmark National Report

Katrine from Denmark presented the National Report stating that they have been working in an MSDI for 6 months with 84 datasets available so far and only use web services. She explained the Business case and the identification of 4 groups that will benefit of the information. Nowadays the MSDI is only accessible for 11 marine authorities but, a next step could be opened it to other stakeholders. Also provided some explanations on the Danish Maritime Spatial Plan with the First version of the platform ready for national consultation by April 2021 and That is only accessible for the ministerial working group participants. In relation to the Legally binding digital maps, she mentioned that Denmark is working towards publishing all spatial data digitally in the future.

L. Sinapi asked if Denmark is planning to share the Danish MSDI at a Regional level and the idea is to be open, sharing the data on the MSP.

c. New Zeeland National Report

R. Gabara from New Zeeland presented the National Report explaining the LINZ preparation for S-100 and the respective plan with: a new database; the automation of the conversion from S-57; scale independent layers, the Derived PC products, the S-100 and S-101 and the gridded ENC schema. In relation to the LINZ work to Joining Land and Sea data integrating datasets collected at different datums across Land and Sea was explained the LINZ approach in improving the national tide model and tie it with the ellipsoid and then develop a transformation tool.

In the end she presented the National approach towards Marine Geospatial Information with the creation of a Working Group to facilitate the National collaboration and also presented the work programme as well as the investigation on the Data Portals with New Zeeland MGI to help the users.

D. Hains asked if they are working also with the terrestrial a water cadastres since joining Land and Water is often a challenge. Rachel mentioned that yes since they are in the same organization.

In relation to the plan to harmonize the ENC and the paper chart catalogues to automatically create paper charts from ENCs was explained that the intention is derive both from the database.

d. Singapore National Report

P. Pang from Singapore presented the National Report with an update on the GeoSpace-Sea portal, the national central repository of marine and coastal spatial data. It described the strategic direction of GeoSpace-Sea and its integration into the Singapore Geospatial Master Plan that have three specific areas, the Data, the Governance and Capacity Building with National geospatial training, programmes and outreach. She also explained the future plans to create new partnerships, develop operational sustainability, enhance the GeoSpace-Sea (data, metadata, standards, technology) and operationalising an integrated MSDI and NSDI.

In the strategic direction they are progressing with other agencies and institutes of higher learning involved.

J. Nyberg asked if in the Capacity Building there are also other partners such as the universities if they plan to offer certificates, etc. P. Pang mentioned that is an exciting idea and that for now they are just working at the national level with what is available.

e. Netherlands National Report

Ellen Vos from Netherlands presented the National Report starting by the needs that comes from a Study about the organisation of Geospatial information in the (Dutch part of the) North sea which concluded on the growing importance and value for the society especially on energy, the growing amount of stakeholders and also a growing focus on international topics (e.g. SDG 14, Paris Agreement, Sendai Framework). One of the conclusions was on the fragmentation of the organisation, with a large number of portals and standards. The study also concluded on different types of users using different types of data for different types of purposes. For the future it should be more focused on the users, searchability, central organisation of federated data sources, cooperation, rights, restrictions and responsibilities, data and composed products/visualisations, API's etc. She also presented the international involvement of the Netherlands HO in several international groups related with the MSDI and some international events. The presentation ended with the MSP mentioning a National publication related with the MSP challenge approach.

f. Norway National Report

G. Heggebø presented the National Report of the Norwegian SDI starting by summarizing the National cooperation on SDI with more than 600 organizations of the public sector involved. The objective is to support the users in a proper way sharing and re-using the data. He also developed on the National Spatial Data infrastructure main focus: the data and content; the technology & tools; the Policy & Framework; and, the Organization & Cooperation. G. Heggebø explained the geospatial strategy towards 2025 such as the governance and the policy. He also described in what standards they are main focus and the service main approach with the objective to provide authoritative data to the community. In relation to the MSP was explained the cross-sectoral cooperation among the institution's members of the management forum and the Marine Spatial Management Tool a project through an intergovernmental cooperation.

g. USA National Report

Caitlin Johnson presented the National Report of the USA starting with the National policy and governance, the international MSDI participation and a resume of NOAA MSDI Strategy. In relation to the Information Systems, she explained the change from the product centred approach to the data centred approach and that NOAA and NGA now have a Nautical Information System and a National Bathymetric Source. In relation to the technical standards NOAA rapidly adopted the IHO S-100 and OGC Standards when possible such as the Federal Geographic Data Committee (FGDC) Metadata Standards. Some spatial projects were showed such as NGA GEOINT Services - Digital Elevation Models (DEMs) and the recently announced NGA Data Integrity Project. Also, the recent updates on the National SDI were enhanced. The Marine Cadastre Portal is other place with trusted datasets and also there are other few Ocean data catalogues and Portals.

h. Republic of Korea National Report

Kim Namhoon presented the National Report with the current status of MSDI starting by the change of the law in RoK. He developed on the transformation of MSDI from the product centred to a data in a database centred but explained that this implies some challenges and several difficulties that were explained along with the fairway data model. It was also explained the concept of Marine Basemap a new version of the Chart and developed on layers to support the users needs. The presentation was finalized with the plan to implement the IHO E-learning Center and the appeal for the collaboration with this Center, providing products to became available.

i. Spain National Report

Gustavo Gómez-Pimpollo presented the National Report from Spain starting with the Dissemination of spatial data set and services, iaw INSPIRE. The National spatial data set oficial catalogue was showed and the access in the Inspire Catalog were the information is available. The Application programming interfaces were some data is available and might be downloaded was also mentioned and also was explained the external data policy document and that the Spanish HO had created an internal roadmap to implement the S-100 family products and to implement the conversion from S-57 to S-100 products.

j. Baltic and North Sea Regional Report

The Chair reported on the online meeting that the Baltic Sea and North Sea Marine Spatial Data Infrastructures Working Group had in last August enhanced that have more participants than normal due to the online format. He described the presentations received such as the related with: the new call from EMODnet bathymetry; the S-121 Maritime Limits and Boundaries; the EU MSP Technical Expert Group on Data that have agreed to have joint online meetings and have a closer collaboration; the long discussion with Norway to plan a MSDI Hackathon but recognizing that they have a lack of resources.

5. Presentation from external stakeholders

Docs: MSDIWG12on-05A   Hydrospatial
*   MSDIWG12on-05B   Arctic SDI*

a. **Hydrospatial**

D. Hains gave a presentation on the perspective of Hydrospatial and Hydrography, and emphasized that this terminology is not intended to replace Hydrography but, to be an extension aligned with the concept of what is MSDI. The proposal is to have a term equivalent to Geospatial but applied to the waterside to highlight its importance and the term has already started to be used. The proposal is to have a term equivalent to Geospatial but applied to the water side and the term has already started to be used. He mentioned that we are going through the spatial evolution and that means, that we are moving towards hydrospatial. He also explained the Why, for Who, Where this will take place, When should we move, How should we move and What are we really talk about. He pointed to the definition of Hydrography in the IHO website and proposed a defemination on what is Hydrospatial. However, his intention was not to arrive at a final definition in this meeting but rather start the discussion to continue an important conversation and encourage all who have not done so yet, to use the term more and more. It was also mentioned the questionary had been provided at several events and that the IHO Secretary General acknowledged the importance of the term and suggested to use it as an adjective.

The Chair thanked D. Hains but highlighted that this is not a topic under the MSDIWG ambit. IHO Director Sinapi mentioned that the IHO is celebrating the centenary and that most of the people not inside our community do not know the term Hydrography and that there is a WG in the HSSC related with the IHO Dictionary that could deal with the Hydrospatial term.

D. Hains informed that a global Hydrosptial Movement Club and Community (HMCC) is being implemented to advocate the importance of hydorspatial. He thanked the Chair and he indicated that he will keep the MSDIWG members informed of the progress with HMCC in the future.

b. **Arctic SDI**

S. Riopel and P. Pouplier provided a presentation on the Arctic Spatial Data Infrastructure. Their update explained that the Arctic SDI is a collaborative effort of the National Mapping Agencies of the Arctic and described the respective objectives. In relation to the new 2020-2025 Arctic SDI Strategy, the main objectives were presented including the new concept of Multidimensional Digital Arctic which combines information from different domains: marine, land and atmosphere. The Web platform was presented, as well as the Geoportal and his functionalities. Also, the structure was described with the proposed Arctic SDI – ARMSDIWG joint activities. An emphasis was given to the OGC Marine SDI Pilot that is under development and a new project of automated harvesting Web services with its goals, automated cataloguing methodology and some results.

The Chair asked if the Artic SDI Governance model could be used for SDI Regional Basis and if the governance documents could be available in the MSDI website. Simon mentioned that yes and even the minutes of the meetings are available. It was also asked if the automatic harvest prototype information could be made available, the answer was that yes, after the end of the contract. The Chair mentioned that the MSDIWG have an action to build a Portal and will be good to have material to put there.

Simon Riopel, in the chat, shared the following links:
- Arctic SDI: https://arctic-sdi.org/
- Arctic SDI Strategic Documents (MoU, manuals, guidelines, governance, working groups,...): https://arctic-sdi.org/documents/strategic-documents/
- Board Meetings - Minutes: https://arctic-sdi.org/documents/meetings/

c. **Arctic MSDI and Arctic Voyage Planning Guide**

S. Carisio provided a presentation on some of the challenges in the Arctic. The Arctic National Mapping Agencies of the Arctic SDI Board and the Member State Representatives of the Arctic Regional Hydrographic Commission (ARHC) are committed to maintain a collaborative partnership and are looking towards the OGC – IHO Federated Marine SDI (FMSDI) Demonstration Pilot. The Arctic Voyage Planning Guide is intended to be a strategic voyage planning tool with a compilation of data and services relevant to mariners preparing to travel in the Arctic. Right now, this tool has so far 7 themes and 24 datasets in those themes with 5 datasets strongly supported. It was also presented the Arctic Voyage Planning Guide Governance Challenges such as the identification available data services and resources, the level of governance and the need of Additional technical expertise, time, and technology resources.

The Chair mentioned that the Danish HO is investigating how they could work together on such a project

d. **Seabed 2030 and how the MSDIWG can support Seabed 2030 in the future?**

J. McMichael-Philips provided an overview on GEBCO SEABED 2030 project with the respective objective to provide the most authoritative, publicly-available bathymetry data sets of the world's oceans. He briefly explained how the project was born and the motivations related with the need to increase the bathymetric knowledge of the oceans. The importance of partnerships and the Network was presented as well as the constitution of the Project Team and the alumni Network. The GEBCO Grid in June 2020 presented 19% of coverage a clear evolution since the 6% in the beginning of the project.

In the 2nd phase the objective is to map. He mentioned several initiatives that brought data to the project and that some CSB field trials were sponsored but more are needed. Hence, for that they are working very closely with the CSBWG. Healso mentioned some of the Ocean Frontier initiatives to map unmapped seafloor. For the future, the objective is to build new partnerships, increase the availability of crowd-sourced bathymetry data and bring the Ocean mapping community together.

7. Welcome and the conclusions from Day One

The chair presented the conclusions and reflections from the 1st day and presented the agenda for the 2nd day. In relation to the Strategic Direction, it was commented that it should be aligned with the IHO Strategic Plan Goal 2 and 3.

Director Sinapi commented on the conclusions drawing the attention to some important points such as: the Artic SDI as a role model for RHC MSDI cooperation in the future and the importance to have a sort of vision to align the new Strategy with the IHO Strategic Plan.

8. IHO MSDIWG Draft Work plan 2021 - 2024

Docs: MSDIWG12on-08A   Draft MSDI Work Plan 2021-24

The Draft Work Plan was presented and the Chair mentioned that the intention is to circulate it and give members 3 weeks to comment. Then the Chair went through all the new tasks.

In relation with Task A.2 G. Heggebo volunteered to be part of the group as well as NGA.

On task C.1, G. Heggebo enhanced the need to have a harmonization between C-17 and the UN-GGIM principles concepts and he volunteered to be part of the Project Team.

On task C.2 the cooperation between the MSDIWG's of the different RHC's was enhanced due to the importance of involve the RHCs, some already with MSDIWGs, in the work of the MSDIWG.

S. Carisio mentioned that on the A.1 that he developed some new contacts with the OGC and UN GGIM IGIF on the work that has been done in the maturity assessment.

On task E.4, it was expressed the need to identify some member states to participate on it.

On task H.1, it was expressed that the expectation was to receive some offers to host the future meetings.

Annex A presents the Draft Work plan 2021 - 2024.

9. Action list

In relation to the status of the Actions List, it was mentioned the intention was to go through them in the next meeting. A summary of the action items was presented and participants were asked to send any comments to the Chair or the Secretary.

10. Status from:

Docs: MSDIWG12on-10A UN-GGIM - Guide Role Standards Geospatial
MSDIWG12on-10C The use of S-100 in relation to MSDI/MSP
MSDIWG12on-10D UN-GGIM IGIF updates
MSDIWG12on-10E IHO-Singapore Innovation and Technology Laboratory

a. OGC MDWG

J. Pritchard presented the Open Geospatial Consortium updates starting with the Vision, the Mission and the Approach. He also mentioned who are the members from the diverse areas and that the topic of focus is the MSDI Pilot. Then he resumed the meetings they had most recently and commented on the comments received related with the standards. He highlighted that OGC is also involved in the revision of the Guide to Geospatial Standards that is in the process of being reviewed by the Core Team involved and the areas of opportunity was also described as well as the areas of opportunity and the important focus areas.

b. UN-GGIM WG-MGI/ UN-GGIM IGIF Water

J. Nyberg presented the UN GGIM WG in Marine Geospatial Information, the objectives of the WG and the membership as well as the last meeting of the UN GGIM Committee of Experts with a link to the respective Report. The white paper on readily Available and Accessible (Open) Marine Geospatial Information was one of the biggest achievements it contains information on the highest challenges and includes several case studies. He also provided some highlights of the updated Work Plan 2021-22 and introduced the IGIF W (water) a guide to assist IGIF with the aspects on the water domain.

J. Pritchard explained the aim of IGIF W and the work plan as well as the meetings they had and also the upcoming items were mentioned.

D, Hains indicated that in reference to his presentation that IGIF W is really synonymous of hydrospatial.

On the difference between IT-4 and C-17 J. Nyberg mentioned that there will be some consultations among the members and both publications should go on together. The Chair expressed that we need to rethink C-17 and it should be more specific on the HO's needs. M. Osborne commented that both publications are complementary.

c. The use of S-100 with relation to MSDI/MSP

J. Pritchard presented the S-100 Rollout, the proposition, the possibility to use and promote S-100 to encourage better interoperability between the MSDI stakeholders and the main opportunities. He concluded that the S-100 now tends to be navigation focused but it does not have to be that way since S-100 is a neutral framework.

The Chair expressed that a proposal should be made to IRCC to task HSSC to start to look at S-100 in a MSDI perspective. J. Pritchard mentioned than the activities of the MSDIWG are more concerned with web services and streaming to distribute data.

Director Sinapi concurred that the S-100 data is central and the S-100 framework is not limited to data for the Hydrographic products only. The IHO is supporting the expansion to other maritime domains and it is time to have a stronger relation between the IRCC and HSSC with a proposal to IRCC to create a stronger link between the S-100 WG and the MSDI WG.

G. Heggebo expressed that in some marine domains S-100 is not known and it is necessary to have some initiatives to introduce the concept or it will only remain for Hydrographic data. The Chair suggested to make a proposal to the IRCC on the introduction of the concept.

Notes from the Chat:

M. Osborne mentioned that C-17 provides specific guidance for HOs but it needs to be kept up to date with IGIF etc in order to be complementary. Also, C-17 should make the link to SOLAS related products because otherwise the wider benefits that HOs will gain from Hydrospatial will be lost. It is necessary to differentiate between the S-100 based theme specifications, which by definition should be neutral, and the S-100 based application specifications e.g. S-101. Application specifications can draw from the Theme Specifications as long as we have that understanding and framework in place, as an example, not all of S-121 would end up in S-101 but some of it, would for sure.

G. Heggebø expressed that perhaps MSDI / S-100 roadmap must align with MSP roadmap to be relevant for MSP community? Ref. -> https://www.mspglobal2030.org/msp-roadmap/

C. Florentino mentioned that both documents IGIF-W and C-17 are really important. However, in order to avoid overlaps and misunderstanding, the IGIF(W) should indicate or address that some specifics issues could be found in C-17.

M. Osborne mentioned that it is necessary to be clear about MSDI being application neutral i.e. FORM not FUNCTION.

J. Carey stated that a fundamental question around utilising data for wider use than navigation is that of permissions - how are members recording the terms of use of data?

R. Ponce clarified that there are two different aspects: One is the type of S-100 products and another is the business model to make these information products available. For instance, e-Navigation has the concept of "Maritime Service Portfolios" and the "Single Window" for accessing them.

J. SCHRÖDER-FÜRSTENBERG stated that the use of Mariner Resource Names could be a possible tool to resolve the problem.

G. Heggebø provided the link to another relevant marine community managing marine data as an example ->http://marinebiodiversity.org/

d. UN-GGIM IGIF updates

P. Pang provided a presentation on the UN-GGIM IGIF updates and the IHO MSDI WG participation in the revision of the UN-GGIM role of Standards Guide. The background of the work was described and mentioned that the Standards Guide and Companion Document were last revised in 2018. The MSDI team that had been participating in the process was also presented. The timeline was shown as well as the Progress and she summarized the IHO

MSDI WG inputs enhancing the fact that the MSDI WG Members were invited to comment on the UN GGIM standards Guide Ed. 3. The Chair considers that is a unique change to contribute to the UN GGIM standards Guide and proposed one action item for members to comment on it (Action 13/2021).

e. IHO-Singapore Innovation and Technology Laboratory

P. Pang provided a presentation on the IHO-Singapore Innovation and Technology Laboratory presenting the objectives of the Laboratory. It is planned to be launch in next October during the MSDI WG 12 Meeting in Singapore. To participate, there were 3 proposed ways: Projects, Data and Procedure. IHO Members were invited to submit projects and the MSDI WG was invited to participate in the project and in the work of the Laboratory.

The Chair proposed to go through the action lists and see if there is anything where the WG could participate and explore via the Laboratory.

Director Sinapi mentioned that the IHO is participating in the draft Guidelines and that the Laboratory will be a tool to help in the implementation of S-100 Strategy.

The Chair asked which will be the process to apply for a project in the laboratory and that will be defined in the Guidelines.

11. OGC Federated MSDI Pilot and MSDI training material

Docs: *MSDIWG12on-11A* *OGC Federated MSDI Pilot*
         MSDIWG12on-11B *MSDI training material – The need for update*

a. OGC Federated MSDI Pilot

J. Pritchard replacing T. Taylor provided a presentation on the OGC Federated MSDI Pilot. He presented that the Federated MSDI Pilot is a multi-country, Federated Marine Spatial Data Infrastructure (SDI) under land/sea interface use-cases, its respective goals, and that the expected outcomes are practical technology demonstrations on how using OGC, IHO, and other open standards could enable the community's ability to find, obtain, use, share, interoperate, and reuse data. They will also be looking to find what will be the impact on the OGC and the IHO standards. The main reasons why the stakeholders should sponsor the Pilot were also explained and that there are some direct benefits for being a sponsor. In the upcoming coordination meeting, with the sponsors, the requirements will be aligned.

The Danish HO intends to participate and probably will be a sponsor and also the USA NGA is very interested in being involved and participate as well.

The Chair commented that it will be good to have other HO's participating and mentioned that it should be considered if some institutions cannot contribute with money if it is possible to participate with technical resources, expertise or data. It was mentioned that for sure it will be possible to contribute in different ways, not only financially.

b. MSDI training material – The need for update.

J. Pritchard provided a presentation related with the available training materials and where they could be found, such as in the IHO web page, in the MSDI "Body of Knowledge" that contain links to some of those materials. Some recommendations were provided such as the fact the page needs some improvements and better guidance in how to use the materials.

The Chair mentioning that is necessary to think and debate how the MSDI WG can contribute to the IHO E-learning Center. One problem is the resources required to update the training

material and is necessary to have two approaches how to collaborate and how to maintain the material updated.

c. Update of C-17 – New update, possible alignment with UN-GGIM IGIF Water.

The Chair explained the need to update the C-17 not only on the contents but also in the alignment with the UN GGIM IGIF(Water). Chair also mentioned that is necessary to review the format in order to have a more flexible way to update it. He intends to send an email to the MSDI WG Members asking for volunteers to participate in the revision.

12. Update of Work Plan and List of Actions

Docs: MSDIWG12on-12A List of Actions

The Meeting went through the new Action Items and the Chair mentioned that the list will be circulated for comments for 3 weeks.
The new actions were presented and commented on by the presenters.

Annex B presents the List of Actions.

13. Any other business

On this agenda item the Chair mentioned the International Conference on Marine Data and Information Systems (IMDIS) planned to be between 12-14 April by VTC with a free participation. The conference will have several sessions with very interesting topics.
It was also mentioned the European Data Portal on use-cases and the Open Data in Europe 2020 which is about maturity in relation to open data with indicators that cover the level of development of national policies promoting open data.
On the next MSDI WG Meeting P. Pang mentioned that Singapore would like to host the next meeting hopefully in a physical format or if it is not possible, due to the pandemic, in a hybrid format, from 25-29 October 2021.

14. Election of Chair and Vice Chair

The only candidates received by the Meeting were for the position of:
- **Chair:** Mr. Jens Peter Hartmann (Denmark), and
- **Vice-Chair**: Ms. Pearlyn Pang (Singapore).

Both were elected by acclamation.

The Chair congratulated Pearlyn Pang for her election as Vice-Chair and also thanked S. Carisio, the former Vice-Chair, for the collaboration and wished him all the best in the future. S. Carisio expressed some farewell words and mentioned how he appreciated to be the MSDI WG Vice-Chair.

15. Closing of the online meeting

The Chair closed the meeting.

IHO Marine Spatial Data Infrastructures Working Group (MSDIWG)
DRAFT WORK PLAN 2021–2024

MSDI Tasks

A	Communication and dissemination
B	Operational - Data sharing and management
C	Policies and governances – RHC. (Ensure that MSDI is a standing agenda item for RHCs' meetings (IHO Res 2/1997, as amended, refers))
D	Standards (OGC and HSSC)
E	Innovation – Future perspectives (2021 - 2030)
F	Training and education
G	Maintain and extend the publication IHO MSDI C-17 (IHO Task 3.9.2.1 refers)
H	Conduct annual meetings of MSDIWG, arranged back to back with 1-day MSDI Open Forum (IHO Task 3.9.1 refers)

No	Work item	Priority H-high M-med L-low	Milestones	Start Date	End Date	Status P-planned O-ongoing C-completed	Responsible / contact person(s)	Related Pubs / Standard	Remarks
A.1	Implement MSDI and MSP Maturity Assessments (national and regional) to enable consistent reporting from MS through RHC to IRCC.	H	1. Evaluate available template's 2. Decide on template. 3. Promote template to use. 4. Send out template to MS for national Maturity Assessments	2021	2023	P	USA (NGA) Chair		
A.2	IHO Strategy Goal 2.1. Build a portal to support and promote regional and international cooperation in marine spatial data infrastructures (MSDI).	H	1. Investigate the different possibilities 2. Gather information and evaluate IHO MS user needs 3. Prepare a proposal for IRCC approval 4. Build a portal	2021	2024	P	IHO Sec. Chair Vice Chair NGA Norway		
A.3	Develop MS or RHC relevant Case Studies. Ref: C2 (Investigate if it is possible to engage the RHC MSDI ambassadors)	M	1. Baltic Region 2. Brazil 3. East Asia Region	2021	2023	P	Denmark Brazil Korea		
B.1	Create an implementation guide "roadmap" template for MSDI, at national and/or regional level. (IGIF Implementation Guide, Strategic Pathway 1 to be considered.)	H	1. Gather information 2. Compile information 3. Publish template for implementation	2021	2023	O	USA, (NGA) IIC ESRI H2i		

B.2	Identify core data for input to MSDI to support multiple applications [Ref: B1] Ref. to IGIF and IGIF W. and OGC Concept development study.	M	1. Marine Cadastre 2. Emergency Response 3. Coastal Zone Management	Mar 17	2023	O	Chair/V. Chair		
C.1	Alignment with UN-GGIM IGIF and IHO MSDI C-17	H	1. Compare the two foundation concepts 2. Define the HO perspective 3. Propose changes to C-17	2021	2022	P	Chair/V. Chair NGA Norway		
C.2	Cooperation with RHC MSDIWG	H	1. Identify and list RHC MSDIWG MS, Chairs RHC MSDIWG and MSDI RHC Ambassadors 2. Create procedures for cooperation	2021	2024	P	Chair IHO Sec.		
C.3	Develop a governance model for MSDI	M	1. Deliver best practice governance models to BoK (Ref: B1) 2. IGIF Implementation Guide, Strategic Pathway 1 to be considered.	2017	2023	O	Denmark USA (NGA)		
C.4	Data Sharing and Publishing Licence	M	1. Provide updated licensing models and templates as 'best practice' to MSDI BoK	2018	2024	O	NZ, USA, OceanWise, Indonesia, Malaysia ESRI		
D.1	Identify relevant standards to support MSDI implementation and operation. Ref: B1.	H	1. Provide annual reports to IRCC and HSSC	2021	2024	O	OGC Marine DWG		
D.2	Assess the suitability and shortcomings of standards in supporting data interoperability.	M	1. Identify standards relevant to bathymetry (Ref: D1) 2. Marine Cadastre 3. Oceanography 4. Opportunities with HSSC/S-100 during decade of implementation. (To identify the best opportunities to use S-100 in MSDI as well as interoperability with OGC API Standards.)	2018	2024	O	OGC Marine DWG Portugal Chair		

D.3	Cooperate with the OGC MSDI Pilot	M	1. Participate in and Promote the OGC Pilot Project 2. Assess output from the OGC Pilot 3. Evaluate relevance and implications from a HO perspective 4. Take (appropriate actions as necessary	2021	2023	O	Chair		
E.1	Identify and report on the future trends affecting MSDI e.g. autonomous platforms, standards, big data, cloud, internet of things and artificial intelligence.	M	1. Information gathering (Horizon Scanning) 2. Publish White Paper (inc: PPP)	2018	2024	O	ESRI OceanWise USA Portugal Caris H2i		
E.2	Establish an IHO MSDI Vision for 2030.	L	1. Prepare draft Position Paper ("think piece") to include technologies, methodologies, sustainability 2. Align with other Visions 3. Align with IHO Strategic Roadmap for S-100	2018	2023	O	Chair IHO Sec. OceanWise UK US (NGA)		
E.3	Identify challenges, options and solutions in relation to data security and integrity from a HO MSDI perspective	M	1. Information gathering (Horizon Scanning) 2. Reporting to IHO MSDIWG 3. Evaluate input to C-17 and IHO bodies/WG 4. Investigate possibilities with Blockchain based system for assuring data integrity. 5. Take appropriate actions as necessary	2021	2023	P	Chair V. Chair IIC		
E.4	Corporation with IHO-Singapore Innovation and Technology Laboratory	M	1. Identify the different IHO MS user needs with relation to future trends affecting MSDI (E.1) 2. Discuss how IHO MS can participate in the work of IHO innovation lab	2021	2024	O	V. Chair IHO Sec.		

				3. Report back to IHO MS						
F.1	Develop and maintain training syllabi	M	1. Review and update in line with relevant developments, methods and content	2018	2022	O	Denmark IIC		
F.2	Support development and delivery of e-learning platforms	L	1. Coordinate activities with East Asia (KHOA) 2. Coordinate with E-learning PT. 3. Compile list of existing e-learning modules relevant to MSDI	2018	2023	O	Esri OceanWise KHOA Chair IHO Sec.		
F.3	Develop a MSDI communications plan for MSDI BoK	M	1. Identify the need, audience and focus 2. Report findings 3. Deliver Plan	2018	2022	P	IHO Sec. NZ(LINZ) Netherlands US (NOAA)		
G.1	Maintain IHO publication C-17 to reflect developments in ICT, Content, Standards and Governance of MSDI. V2.0 now approved by IRCC	H	1. Manage content 2. Create a Wiki 3. Request IRCC remove document from IHO Res: 2/2007 4. On-line dynamic content	2017	2022	O	OceanWise ESRI USA/NGA Denmark Germany Portugal		
G.2	Update C-17 in accordance with BX (UN-GGIM/IGIF)	H	1. Create a C-17 drafting team 2. Identify the need for changes 3. Evaluate the structure of C-17 with IHO MSDIWG members. 4. To send out a questionnaire to IHO MS and RHC's. 5. Update C-17.	2021	2023	P	Chair NGA		
H.1	Conduct 2019 -21 meetings of MSDIWG, arranged back to back with MSDI Open Forum, OGC Marine DWG and UN-GGIM MGI WG meeting. 2021 – Singapore 2022 -? 2023 -? 2024 -?	H	1. Date and venue defined 2. Logistics in place 3. Open Forum program defined 4. Develop content for DWG workshops	2017	2024	O	MSDIWG Management Group (Chair/Vice Chair, IHO Sec.)		

Annex B - List of Actions

IHO Marine Spatial Data Infrastructures Working Group online Meeting

17-18 March 2021

LIST OF ACTIONS FROM the online MSDIWG meeting 2021_v.3.1

Action N.	Action Items (agenda item)	Responsible	Deadline	Status
04/2017	Action 4/2017: Submit an updated paper to HSSC11 outlining further development and implementation of DGGS.	OGC Marine DWG	May 2019	OGC Marine DWG investigating delivery of this.
04/2018	Action 4/2018: MSDI case studies: provide 500-word (maximum) examples for MSDI BoK.	Malaysia, Indonesia, RoK, USA	March 2020	USA provided Arctic case study FEB 2020.
19/2018	Action 19/2018: Include "economic impacts" of MSDI with respect to hydrography in the MSDI BoK. MSDIWG Members to send relevant reports and case studies for BoK.	All, IHO Secretariat	December 2019	Ongoing
04/2019	To investigate the development of a "Guide on Standards for the Common People" to be made available in the BOK (6)	OGC Marine DWG	April 2019	Ongoing
05/2019	To add the OGC "Guide on Standards for the Common People" in the BOK from Action MSDIWG10/04 (6)	IHO Secretariat	May 2019	Ongoing
06/2019	To share MSDI use cases as they are developed by the EAHC/MSDIWG and report the status to the MSDIWG (7)	EAHC MSDIWG	MSDIWG11	Investigate
10/2019	To investigate how to make the e-learning developed by Denmark in the EAHC TRDC e-learning platform hosted by ROK (10)	ROK, Denmark	September 2019	Ongoing
14/2019	To develop an outreach strategy considering the target audience and the means to do it and report back to MSDIWG (11.1.1)	Drafting group (USA, Denmark, IHO Secretariat)	MSDIWG11	Awaiting
19/2019	To submit a paper to HSSC on data integrity for MSDI with a precise description of the problem to be solved (11.2)	OGC Marine DWG	HSSC12	OGC Marine DWG will submit to HSSC12 this year
23/2019	To prepare a paper to submit the template on maturity assessment produced under Agenda MSDIWG10/22 to IRCC (11.3.1)	MSDIWG Chair	IRCC11	Postponed

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24/2019	To investigate the possibilities for the development of an online living C-17 publication (12.1)	MSDIWG Chair, Vice Chair and IHO Secretariat	MSDIWG12	Ongoing
25/2019	To investigate the incorporation of the living C-17 to the IHO website infrastructure (12.1)	IHO Secretariat	MSDIWG12	Ongoing
26/2019	To consider the draft C-17 produced under Actions MSDIWG10/25 and to submit to IRCC12 (12.1)	MSDIWG11	MSDIWG12	Ongoing
01/2020	To draft a CL on MSDIWG11 outcomes (CDS, questionnaire, video)	IHO Secretariat	MSDIWG12	
03/2020	To update the BoK with the list of marine themes.	IHO Secretariat	MSDIWG12	
9/2020	To send questions from MSDI Maturity Assessment Survey out to MSDIWG MS for comment.	VC/MSDIWG	MSDIWG12	
10/2020	Investigate distribution options for MSDI Maturity Assessment Survey.	C & VC/MSDIWG	MSDIWG12	
11/2020	Possibly turn MSDI Maturity Assessment Survey in to IHO Online Form.	VC/MSDIWG, IHO Secretariat	MSDIWG12	
12/2020	Release MSDI Maturity Assessment to IHO and share with UN-GGIM WG-MGI.	C & VC/MSDIWG, IHO Secretariat	MSDIWG12	
13/2020	Update to C-17 to be included in MSDIWG work plan and investigate a new format (e.g. Wiki). Include IGIF in update of C-17 (crosswalk)	C/MSDIWG, Co-Chair UN-GGIM WG-MGI	MSDIWG12	
14/2020	Establish a drafting group for C-17.	C/MSDIWG	MSDIWG12	
16/2020	Investigate possibilities for funding for enhancements to training material.	C/MSDIWG	MSDIWG12	Ongoing
17/2020	Create Spanish version and French versions for enhancements to training material.		MSDIWG12	Awaiting/to discuss later
19/2020	To work on the landing page (i.e. home page) for training material.	MEX, IHO Secretariat	MSDIWG12	
20/2020	How to investigate the possibility of train the trainee for MSDI training material.	C/MSDIWG IHO Secretariat	MSDIWG12	
21/2020	Submit the MSDI use cases to the UN-GGIM/WG-MGI.	IHO Secretariat	MSDIWG12	
22/2020	Developing the MSDI use cases in a future revision of the IHO publication C-17	C-17 Drafting Group	MSDIWG14	

23/2020	Template framework for MSDI use cases in MSDI BOK	NZL, VC/MSDIWG, IHO Secretariat	MSDIWG13	
28/2020	Create use cases for MSDI-supportable UN SDGs identified by MSDIWG breakout group.	CAN, GBR, BRA	MSDIWG12	
29/2020	Visualize/describe governance model in C-17, training material and body of knowledge.	C & VC/MSDIWG, IHO Secretariat	MSDIWG14	
30/2020	Update MSDIWG ToR with C-17 maintenance	C/MSDIWG & IHO Secretariat	MSDIWG12	
31/2020	IHO Strategic Plan 2.1: Build a portal to support and promote regional and international cooperation in marine spatial infrastructures (MSDI).	C & VC/MSDIWG, IHO Secretariat	MSDIWG12	
32/2020	IHO Strategic Plan 2.3: Apply UN shared guiding principles for geospatial information management in order to ensure interoperability and extended use of hydrographic data in combination with other marine-related data.	C & VC/MSDIWG, IHO Secretariat	MSDIWG12	
33/2020	Value proposition statement prepared for MSDI MS who have not yet engaged in the process (1 page)	OceanWise, OGC	MSDIWG13	
1/2021	To investigate if status of national MSDI implementation in the national reports, could use the NZ matrix as a new starting point?	C/MSDIWG, NZL	MSDIWG13	
2/2021	To circulate the Arctic SDI Governances documents to the MSDIWG MS	C/MSDIWG & C/ARMSDIWG	MAR 2021	
3/2021	C/MSDIWG should include Arctic SDI Governance document in MSDIWG report to IRCC			
4/2021	To give a presentation of the FAIR principles at the next MSDIWG meeting	C/MSDIWG	MSDIWG12 (in person OCT)	
5/2021	IHO Secretariat to circulate Draft Work Plan 2021 – 2024 to MS	IHO Secretariat	MAR 2021	Concluded
6/2021	MSDIWG MS to comment and indicate their participation in the Draft Work plan	MSDIWG MS	APR 2021	Concluded
7/2021	IHO Secretariat to circulate Draft updated Action list to MS	IHO Secretariat	MAR 2021	Concluded

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8/2021	MSDIWG MS to comment and indicate their participation in the Draft updated Action list	MSDIWG MS	APR 2021	Concluded
9/2021	Circulate IGIF-W (when available) to MSDIWG MS for comment.	C/UN-GGIM WG-MGI & C/MSDIWG	Pending	Expected to be sent in MAR 2021
10/2021	Consider IGIF-W while re-drafting C-17 as a complementary document.	MSDIWG C-17 drafting group	Pending	
11/2021	Make proposal/paper to IRCC linking MSDI and S-100 implementation beyond Safety of Navigation. Circulate to MSDIWG MS for comment.	C/MSDIWG, IIC	IRCC13	
12/2021	Send out draft UN-GGIM Standards Guide Ed. 3	SGP	MAY 2021	
13/2021	MSDIWG MS invited to comment on draft UN-GGIM Standards Guide Ed. 3	MSDIWG MS	MAY 2021	Send feedback to MSDIWG Vice-Chair
14/2021	Review MSDIWG action list for ideas to participate in the joint IHO-Singapore Innovation and Technology Lab. -e.g. development of automatic data harvesting prototype for marine spatial data (ref. Arctic SDI project)	C/MSDIWG, SGP	JUN 2021	
15/2021	Investigate how MSDIWG can provide information to IHO e-Learning Project team	C/MSDIWG, IIC	JUN 2021	
16/2021	Investigate funding to update IHO e-Learning resources	C/MSDIWG	JUN 2021	