

**9th MEETING OF THE IHO MARINE SPATIAL DATA INFRASTRUCTURES
WORKING GROUP (IHO-MSDIWG9)
Niteroi, Brazil, 30 January – 1 February 2018**

DRAFT REPORT

1. Opening remarks, introductions and administration

Docs: CBSC16-01A List of Documents (Chair)
CBSC16-01B List of Participants (Chair)

MSDIWG9-01A List of Documents (Chair) – no comments

MSDIWG9-01B List of Participants (Chair) – request to update – **meeting Action**

MSDIWG9-01C MSDIWG Members and Expert Contributors (Chair)

MSDIWG9-01D ToR and RoP (Chair)

The 9th Meeting of the IHO Marine Spatial Data Infrastructures Working Group (MSDIWG) took place in Niteroi, Brazil, hosted by the Directorate of Hydrography and Navigation (DHN) from 30 January to 1 February 2018. The meeting was opened by VAdm Marcos Sampaio Olsen, National Hydrographer of Brazil, and Mr Jens Peter Hartmann, Chair of the MSDIWG.

VAdm Olsen welcomed the participants and highlighted the importance of MSDI for the national economic infrastructures. Chair thanked the hosts and introduced the key matters to be considered during the meeting and its importance for achieving the objectives of the IHO.

Chair invited the participants to introduce themselves for the benefit of the meeting. The hosts provided logistics and administrative information.

Chair introduced the documents of this agenda item and invited participants to provide input for eventual updates and to consider the proposed draft amendments to the CBSC ToR and RoP (doc. CBSC16-01D). The amendments were subsequently endorsed.

Opening of the meeting and welcome.

b. Introduction of Participants will be invited to introduce themselves.

c. Administrative Arrangements Docs:

Documents are presented and updated as necessary. Logistic guidance and information are provided. Comments received – general agreement that MSDIWG should go beyond the S-100 standards to all standards that affect the MSDI.

2. Approval of Agenda Doc:

MSDIWG9-02 Rev1 Agenda and Timetable (Chair) Participants are invited to comment the agenda and timetable in case updates are necessary. Break out groups in Day two are as follows:

- 1) draft MSDI Vision
- 2) Future of C-17 (document management)
- 3) Progress on WP and Actions
- 4) MSDI Security (data assurance)

3. Objectives and goals of the meeting Doc:

MSDIWG9-03 Work Plan 2017-2020 (Chair) Chair highlights the objectives of the meeting in view of the outcomes of the Assembly, the Council and the IRCC and of the changes in SDI around the world.

Short review of the MSDIWG Work Plan 2017-2020.

- Noted PRO-11 regarding the Availability of Bathymetric Data Worldwide – including the collection and distribution of CSB and SDB
- Noted connection with MSDI and UN-GGIM – need to formalize, Alberto – **Meeting Action**
- 2nd International Workshop on Spatial Data Quality, early Feb, 2018.
- Data management principles – need to identify international group that focuses on standards for data management.

4. Matters arising from MSDIWG8 meeting Doc:

MSDIWG9-04 List of Actions from MSDIWG8 (Chair) List of Actions from MSDIWG8 is reviewed and updated. Ongoing and outstanding items will be either cancelled or moved to the MSDIWG9 List of Actions.

Actions discussed:

- development of the Conceptual Study by OGC (**Action 13**)
- the adoption of the OGC/DGGS Standards (**Action 4**)
- GoToMeeting during MSDIWG meetings (**Action x**)
 - OGC & GoToMeeting – currently successful, consideration on use the IHO. Noting that management of the meeting takes additional resources. OGC observed that it takes two years to learn how to participate with the system, and acknowledging that remote participants cannot expect the same involvement as in person participation.
- Global Spatial Data Infrastructure (GSDI) status, regarding Action 13/2017

5. Reports of other IHO bodies affecting the MSDIWG Docs:

MSDIWG9-05A Report by the IHO Secretariat (IHO Sec.)

- Established full time Capacity building assistant in the Secretariat as of Jan 1, 2018
- C-17 in final draft, positive comments received.
- Reshaping the IHO website – looking for MS involvement

MSDIWG9-05B Request from Croatia on Licensing (IHO Sec.)

- Prior MSDI template created that deals with this issue “**Embracing Rights for the Distribution of Data**”.
- Potential RENC involvement –limit to SoN data
- OceanWise requests guidelines to be implemented, focusing on un-encrypted data for use beyond SoN.
- There is a need to educate nations regarding the re-use of data.
- Difficulty understanding the MSDI role – the problem that can be worked via the MSDIWG needs to be defined, then can be added to the Work Plan to allow IRCC to move forward.

MSDIWG9-05C MSDIWG report to IRCC9 (Chair) – request to WG simply read

MSDIWG9-05D IRCC9 Report, including Lists of Actions – reviewed, see updates as needed

MSDIWG9-05E HSSC9 Report, including Lists of Actions and Decisions (Chair) - reviewed, see update as needed

MSDIWG9-05F MSDIWG submission to A-1 (Chair) – request to WG simply read
MSDIWG9-05G A-1 List of Decisions (Chair) – reviewed as applicable to MSDI
MSDIWG9-05H MSDIWG submission to C-1 (Chair) – request to WG simply read
MSDIWG9-05I C-1 List of Actions and Decisions (Chair) - reviewed as applicable to MSDI

6. National presentation from Members on the status of MSDI

MSDIWG9-06A National Report - **MSDIWG9-06B** National Report - Member States report to MSDIWG the successes and challenges and ways of overcoming them.

MSDI Funding discussion

- USA - public funding based on national policy
- GBR - no specific funding for MSDI, self-funding agency, meeting the need for national requirements such as INSPIRE and EMODNet. Geospatial Committee will be reviewing this over the next two years.
- KOR - breakout between collection and distribution. Opportunities for businesses.
- NZL - no specific budget for SDI/MSDI – but a focus on national challenges, sea level rise etc. Reprioritize resources internally is the basic practice. Shifting skills and resources as the opportunity presents.
- NLD - no specific budget.
- MYS - Hydro office is within Navy, transformation program underway
- ITA - external funds are only available via EU. EMODNet funds some of these activities. Selling ENC funds some activities. Shifting internal budget. Central authority is in charge of SDI, seeking funding from others continues.
- IDN - primary selling charts, funds return to nation with some funds to the HO. Looking to collaborate with others as the opportunity presents.
- DEU - new law “open data” requires all data be made available. Noting that public funds have paid for the service already. Industry 4.0 is a networking program.
- BRA - funded by Gov, no specific funding line. Internal rearrangement is normal.

General agreement that Development and potential funding options should be on the agenda moving forward.

7. Regional and other relevant presentations on MSDI

MSDIWG9-07A Arctic Regional MSDIWG

- 2017 growing activities, regional approach to data to meeting larger global needs
- Connection with land mapping agencies

MSDIWG9-07B BS-NSMSDIWG

- Discussion on the Arctic SDI – highlighting the cooperation with the ARMSDIWG
- Strategic approach, with plans to implement the Arctic SDI

MSDIWG9-07C Baltic MSP data expert group

MSDIWG9-07D OGC Marine Domain WG

MSDIWG9-07E IHO Crowd-sourced Bathymetry WG

MSDIWG9-07F Marine Cadastre in Europe

- Study completed in 2017 – includes marine component
- MSDI is not a cadastre, but can be used within and support the cadastre

MSDIWG9-07G EMODNet

MSDIWG9-07H UN-GGIM Marine Geospatial Information WG

- Agreed to in 2017, first meeting in 2018. The ToR has some specific direction, currently expected to have 7+ MS participation and the Chair of IHO MSDIWG.
- John Nyberg (NOAA) current manager, potential co-chair
- Work effort and plan to be developed

MSDIWG9-07I International Cable Protection Committee (ICPC)

Continued discussion of the need to work with ICPC, via the IRCC with the MSDIWG.

- Need to educate the government officials that may establish programs that harm the cables.
- Potential oversight of this activities via PT
- How to address this issue and what collective activities can be undertaken to mitigate – beyond the education and awareness of the IHO and National HOs.

MSDIWG9-07J -Arctic SDI (I and II) Participants present relevant MSDI initiatives. The meeting considers the inputs to the UN-GGIM/MGIWG. The ongoing work on the Crowd-Sourced Bathymetry guidance document (draft IHO Publication B-12).

OceanWise – Data Governance solutions.

ESRI - ArcGIS Enterprise – focused discussion on the maritime solution

- The next generation “Arc Pro” will support the new standards
- Product on Demand – user sets area and scale, system generates pdf
- Developing the S-100 side, with the ability to use any S-100 product spec

CARIS – more tools to support MSDI

- Data Centric – efficient, broader user needs, shift from product provider to information provider

OGC – Overview of projects of interest: Web Services, Registries, E Learning

- Radical overhaul of web services
- Involvement via Open API with coders and developers
- WFS 3.0, will impact other web services standards (see slide deck)
- Registries and Knowledge Management
- OGC Definitions Server is within OGC footprint. To facilitate semantic interoperability between different systems that use OGC standards. Potential to link all registries, including the S-100 registry.
- All OGC tools are available for partners (including IHO)
- OGC will host content for partners
- Breadth of E-learning – new site that supports a modular approach; E-learning is public and completely free.

8. Task A of the MSDIWG Work Plan 2017-2020

MSDIWG9-03 Work Plan 2017-2020 - The meeting will consider and update the MSDIWG Work Plan 2017-2020, and consider the status, challenges way ahead on activities and actions.

8.1 Task A (Communication and dissemination)

A.1 Implement MSDI Maturity Assessment to enable consistent reporting from MS through RHC to IRCC (Denmark, OceanWise)

- RAG model (red, amber, green) – notational
 - Policy/Governance
 - Organizational Change (culture, change, training etc)
 - Technical (OGC, IHO, ISO etc)
 - Geographic Content (core, applications, business, personal, internal (working), publication/services)

- Data Publishing Staircase
 - Pdf, xlsx, CSB, URI, Linked data
 - What to Measure – build from the C-17 activities?
- A.2 Identify definitions, appropriate and relevant standards and components of (M)SDI.(Malaysia, GSDI)
- Broker – an independent party, whose services are used extensively (listed on the definition slide)
 - Proposal to create a white paper to document and provide for reference.
- A.3 Develop and provide guidelines on MSDI implementation (Canada, IIC, OceanWise)
- Propose to combine with Action B.1 (accepted)
- A.4 Develop MS or RHC relevant Case Studies (Denmark, USA, Brazil, Korea)
- Reviewed via the national reports -
- A.5 Create video recording of MSDI for HO and wider marine community (Korea) Discussion item: the improvement of the MSDIWG Body of Knowledge to include the economic impacts of MSDI with respect to hydrography.
- KOR created a video: Marine Spatial Data Infrastructures, PR Movie
 - Introduction, creation, using and effects, future (based on C-17)
 - Available on YouTube – draft version
- 8.2 Task B (Operational data sharing and management)
- B.1 Create an implementation roadmap template for MSDI (at national and/or regional level) (USA, IIC, Esri)
- USGS has a report on SDI implementation – could be used as a template to follow.
 - Noted that IIC has shifted personnel, expecting to attend next meeting
- B.2 Identify core data for input to MSDI to support multiple applications (Germany, Canada, IIC, OceanWise)
- General core data is compiled, list to be promulgated for comment by MS.
- B.3 Identify wider user requirements for bathymetry data (Portugal, Canada, IIC, OGC, Caris, Esri)
Discussion item: development of an IHO metadata platform for geodata.
- DNK developed an IHO MSDI web interface, with information about the core datasets from each nation. Core data availability, metadata only, but RHC/MS will need to make it happen following some standard TBD.
- 8.3 Task C (Policies and governances - RHC)
- C.1 Draft data policy statements for MSDI (USA, GSDI, OceanWise) – pending, OceanWise has entered into training plan. Pending on the statements.
- C.2 Develop a conceptual architecture for MSDI (Malaysia, Norway, IIC) - MYS presented potential business model for MSDI
- Aggregator Approach; intermediary aggregates from multiple providers
 - Broker Approach; transforms heterogeneous data supplied by providers as services in real time, providers use own structure and semantics for delivery
- NLD - Report from LADM workshop regarding land rights
- Focused on de-conflicting use and claims for space
 - Potential adjustment to the approach could be used for the ocean cadaster challenges
 - Next LADM workshop in Croatia (April 12-13, 2018) – looking for HO or IHO participation
- C.3 Develop a governance model for MSDI (Denmark, USA) Docs:
MSDIWG9-08.3C Arctic SDI Governance – discussed the Arctic SDI as a potential model.
- MoU established and signed by all nations
 - Arctic SDI Governance Document that defines how the organization is set up and establishes the work groups and work plans to move Arctic SDI forward.

- Action to create template governance model for consideration
MSDIWG9-08.3C Danish MSDI Governances model (see above)

There is no expectation for a single governance model, but a long term intent for communication of best practices.

8.4 Task D (Standards – OGC and HSSC)

D.1 Identify relevant standards to support MSDI implementation and operation (OGC Marine DWG)

D.2 Assess the suitability and shortcomings of standards in supporting data interoperability (OGC Marine DWG, Portugal) Discussion item:

The technical matters related to OGC and HSSC.

S-100 datasets with relevance to MSDI.

MSDIWG9-08.4A - S-100 Interoperability Specification background paper – this is S-98, focused on ENC and SoN, but needs to widen scope for other users via the MSDI.

MSDIWG9-08.4B - S-98 Specification for Data Product Interoperability in S-100 Navigation Systems

MSDIWG9-08.4C – Input to GUIDANCE ON CONDUCTION OF AN IMPACT STUDY

- NIPWG noted that as the various groups move standards forward, there may be impacts to other product specifications.
- Considerable discussion around the need to validate data and systems that are used within the MSDI, similar to the ECDIS systems.

8.5 Task E (Innovation – future perspectives)

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 (Portugal, USA, Esri, OceanWise)

E.2 Establish an IHO MSDI vision for 2030 (UK, OceanWise and report to IRCC 10)

MSDI Vision – SPRWG currently underway, discussion regarding the need for a vision to help set the direction regarding MSDI

- Relationship between MSDI and eNavigation
- Noting the shift to autonomous vessels – what do they need?
- Relationship between UN-GGIM MGIWG and MSDI, OGC MDWG – coordination and cooperation
- Economic potential supporting the blue economy
- UN Sustainable development goals – interleaved with MSDI
- The future of digital work – new models of work, evolution of apps, new directions
- Global Marine Technology trends
- Draft IHO Vision
- Follow on objectives that pull the organization toward the vision

MSDIWG DRAFT Vision:

The IHO MSDIWG vision is to enable open, accessible, and interoperable Marine Spatial data and information.

The broader use of MSDI will be able to connect people and systems.

This will create value, marine knowledge, and enhance decisions for the benefit of society, at any level of development, and sustain the environment.

8.6 Task F (Training and education)

F.1 Develop and maintain training syllabi (Denmark, OceanWise)

F.2 Support development and delivery of e-learning platforms (GSDI, Esri, OceanWise)

F.3 Develop a MSDI communications plan (IHO Sec., GSDI) Discussion item: potential for an education platform for MSDI, including e-learning.

8.7 Task G (Maintain and extend the IHO Publication C-17)

G.1 Maintain IHO publication C-17 to reflect developments in ICT, Content, Standards and Governance of MSDI (Ref: Draft Ed. 2.0.0 IHO Publication C-17) (USA, Denmark, Germany, Portugal, OceanWise)

- Discussion item: how to progress C-17 to be fit for purpose with new format, including impacts on security and removal from the annex to IHO Resolution 2/2007.

MSDIWG9-08.7 - IHO Publication C-17

- See breakout group report.

8.8 Task H (Conduct annual meetings of MSDIWG, MSDI Open Forum and OGC Marine DWG)

H.1 Conduct 2018-2020 meetings of MSDIWG, arranged back to back with 1-day MSDI Open Forum and OGC Marine DWG (MSDIWG Management Group: Chair, Vice Chair, Sec, IHO Sec) Discussion item: organize a workshop on MSDI during the future MSDI Open Forums.

- 2019 - KOR to host, timing to be coordinated with IHO Secretariat. Expecting to conduct the Open Forum, OGC confirm combined meeting.
- 2020 – Germany
- 2021 – Singapore

9. Feedback and establishment of the way ahead

Chair leads the debate on the current work and establishment of the way ahead.

10. Updating the MSDIWG work plan 2017-2020 and action list

MSDIWG9-10A List of Actions

MSDIWG9-10B Updated work plan 2017-2020

11. Drafting the MSDIWG9 Report

MSDIWG9-11 Draft MSDIWG9 Report Preparation of the draft MSDIWG9 Report. Draft the key messages, requests and recommendations of MSDIWG to IRCC and to the RHCs.

12. Any other business

13. Election of the Chair and Vice-Chair

MSDIWG9-13 Nomination of Candidates for Chair and Vice-Chair (IHO Sec) The Chair will introduce doc. MSDIWG9-13 with the candidates for MSDIWG Chair and Vice-Chair for the period 2018-2020 and will invite the MSDIWG to elect the new Chair and Vice-Chair.

- Results
 - **Chair:** Mr Jens Peter HARTMANN (Denmark)

- **Vice-Chair:** Mr Sebastian CARISIO (USA)
- Secretary confirmed for additional year.
 - **Secretary:** Mr John PEPPER (John Pepper Consult.)

14. Next MSDIWG Meeting (venue and date)

MSDIWG10 – Republic of Korea (2019, exact dates and venue TBD)

15. Closure

Chair ends the meeting.

END OF MEETING