10ᵗʰ MEETING OF THE IHO INTER-REGIONAL COORDINATING COMMITTEE
IHO-IRCC10
Goa, India, 4-6 June 2018
Report of the Marine Spatial Data Infrastructures Working Group (MSDIWG)

Submitted by:	Chairman, MSDIWG
Related Documents:	IHO Publication C-17.
Related Projects:	None

Chair:	Jens Peter Hartmann, Denmark
Vice-Chair:	Sebastian Cariso, USA
Secretary:	John Pepper, OceanWise
Member States:	Argentina, Australia, Brazil, Canada, Cuba, Denmark, Estonia, Finland, France, Germany, Italy, Japan, Nigeria, New Zealand, Netherlands, Norway, Portugal, Republic of Korea, Romania, Slovenia, Spain, Singapore, Ukraine, UK, USA
Expert Contributors:	CARIS; Envitia; Esri; GSDI Association; OceanWise; Wuhan Univ, China; Geosciences Australia; IIC Technologies Inc.
	see Annex A for full details

1. Meetings Held During Reporting Period

The MSDIWG9 meeting of IHO Marine Spatial Data Infrastructures Working Group (MSDIWG) took place in Niteroi (Rio de Janeiro), 30 January – 1 February 2018. The outcome of the meeting is available from the IRCC section of the IHO Website under the MSDIWG. The MSDIWG meeting was preceded firstly on 29 January by a MSDI Open Forum and after the MSDIWG9 meeting on the 2 February 2018 an OGC Marine Domain WG was arranged.

Figure 1. The participants at the MSDI Open Forum.

The aim of the MSDIWG9 meeting was to focus on MSDI and to propose ways to progress MSDI implementation within the Organisation and its Member States.

Figure 2. The IHO MSDIWG members attending the MSDIWG 9 meeting.

Next Planned Meeting:
The IHO/MSDIWG will hold a day-long MSDI Open Forum, an OGC Marine Domain WG meeting and the MSDIWG 10 meeting in 2019 in Busan, Republic of Korea, on 4 to 8 March 2019. Logistics and meeting details will be available at:
https://www.iho.int/srv1/index.php?option=com_content&view=article&id=483&Itemid=370&lang=en

The IHO/MSDIWG will continue to facilitate a MSDI Open Forum which would allow non-MSDIWG stakeholders (e.g. RHC MS, government, academia, industry, funding bodies and NGOs) to attend to see what the MSDIWG and the commercial partners can offer. Attendees at the Open Forum would then be encouraged to stay on for the MSDIWG10 meeting. This approach is being developed in consultation with the hosts.

The Open Forum meeting will be followed by a three day-long MSDIWG10 meeting at the same venue and the meeting will include WG Work Plan task group break-out sessions. The MSDIWG10 meeting will also be arranged as a back-to-back meeting with the OGC Marine Domain WG meeting. The IHO/MSDIWG will further investigate the possibility to arrange a back-to-back meeting with the newly established UN-GGIM WG on Marine Geospatial Information
The key interest for the IHO is enabling MS to ensure MSDI provides a framework for the provision of hydrographic information beyond the traditional field of surface navigation.

Terms of Reference of MSDIWG:
The MSDIWG Terms of Reference remain unchanged from 2015 and can be found on the IRCC section of the IHO Website under the MSDIWG.

2. Work Programme
Work Plan 2018–2021
The Work Programme was redeveloped at MSDIWG9 based on recent changes and change in focus on MSDI from a regional and national perspective. In order to deliver this Work Programme eight MSDI Tasks were established:
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 - 2023)
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)
The work programme can be found on the IRCC section of the IHO Website under the MSDIWG. See
Annex B for full details of the work programme.

MSDIWG-9 Action List:
The existing action list was updated and renewed. See Annex C for full details of the action list.

3.   Progress on IRCC Action Items
IRCC9/18. RHC Chairs to encourage Member States in the region to nominate RHC MSDI
Ambassadors to promote MSDI and to help Member States to prepare the national reports with respect
to the status of MSDI.
A vital element of this work would be to collect and collate responses from Member State on MSDI
prior to each RHC meeting. It is becoming more important to consider taking MSDI as a RHC agenda
item, therefore we hope to see a National MSDI report prepared by each Member State for submission
to every RHC. The report should incorporate the status of MSDI, plans for involvement in MSDI and
challenges facing the HO.

IRCC9/40. MSDIWG Chair to coordinate matters related to the UN-GGIM to ensure that actions are
aligned and maximized while avoiding duplications.
The MSDIWG chair is now member of the UN-GGIM Working Group on Marine Geospatial
Information and has provided input to the Work Plan 2018/2019.

IRCC9/19. Coordinator USA and IHO Secretariat to consider the OGC proposal and seek for funding
and report back to the IRCC (7)
The proposal to launch an IHO Concept Development Initiative was presented at the IRCC9 meeting.
At the MSDIWG meeting in Vancouver 2017, the MS discussed the possibility to create an OGC
study that could establish the framework for future development of MSDI. After the MSDIWG
meeting OGC has developed a proposal for a concept development study for MSDI, with the ultimate
intent after completion to propose to IHO a full pilot timed for 2018, to be funded by NGA. The
initiative will emphasize the rapid evolution of technologies and methodologies for generating non-
navigational, location-based information of value to a broad range of users.
The following are objectives outlined in the proposal:
- Document the current state of MSDIs
- Document the needs for an MSDI based on current emerging technologies
- Document strategies to interoperate with other Spatial Data Infrastructures
- Develop a common interoperability reference architecture
- Engage with experts from across the user community as well as from the community of technology /
information and services providers, including hydrographic offices, industry, government, research,
and other SDOs

A-1 Decision No 22.
The MSDIWG particularly focus on Shared Guiding Principles for Geospatial Information
Management in the work programmes under MSDI task:
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)

4.   Problems Encountered
Reporting of MSDI activities by MS to Regional Hydrographic Commissions (RHC).
As seen from a MSDIWG perspective, Hydrographic Offices (HOs) are in a great position to supply
core reference datasets to national and regional SDI initiatives, as HO data is critical to activities such
as marine planning, coastal zone management, disaster mitigation and response, and conservation. The
level of reporting of MSDI activities by Member States to RHCs has increased. Some RHCs receive

comprehensive inputs from Member States while others have yet to give MSDI sufficient visibility as a standing agenda item. The MSDIWG has limited visibility on how the majority of Member States engage with government, commerce, academia and the third sector to enable and deliver access to, sharing and re-use of hydrographic data to a wider user community. As a consequence, the MSDIWG has established a draft Case Study Template so the different MS can report on relevant MSDI initiatives. The Case Study Template (see Annex D) will be available on the IHO webpage under the MSDI Body of Knowledge when approved.
https://www.iho.int/mtg_docs/com_wg/MSDIWG/MSDIWG_Misc/MSDIWG-BOK.html

Engagement on MSDI related activities.
Demands continue to be placed on a small number of the members of MSDIWG to attend IHO sponsored events such as RHCs and MSDI meetings, organizing MSDIWG meetings, providing MSDI Awareness short courses, attending meetings with other regional bodies and speaking at industry seminars.

Education and Learning.
The way Capacity Building plans are defined at present means that the focus on data and information management resides somewhere between Phases 2 and 3. MSDIWG suggests that it should take place earlier in the cycle of basic hydrographic understanding and involve elementary "data management best practice" training sessions. The MSDIWG therefore suggest that CBSC should consider this in the light of the experience MSDIWG members and expert contributors have witnessed when delivering Capacity Building Training in MSDI.

5. Any Other Items of Note
Cooperation with the OGC Marine Domain Working Group (DWG)
The MSDIWG are now cooperating with the OGC DWG on a regular basis.

Figure 3. The participants at the OGCMDWG meeting.

The IHO MSDIWG and OGC was invited to participate at the session on Review of the White Paper on Operational Domain Standards for Land Administration on Monday, March 19th at the World Bank in Washington DC. The session took place just before the opening of the 19th edition of the World Bank Land and Poverty Conference. The OGCDWG and the MSDIWG provided a joint input Information Paper: LADM from a Marine Domain Perspective. A MSDIWG member from NOAA gave a brief of the information paper that had been submitted on behalf of the International Hydrographic Organization's Marine Spatial Data Infrastructure Working Group and the Open Geospatial Consortium Marine Domain Working Group. The idea of the paper and presentation was to provide a look at Land Administration from a Marine Domain Perspective.
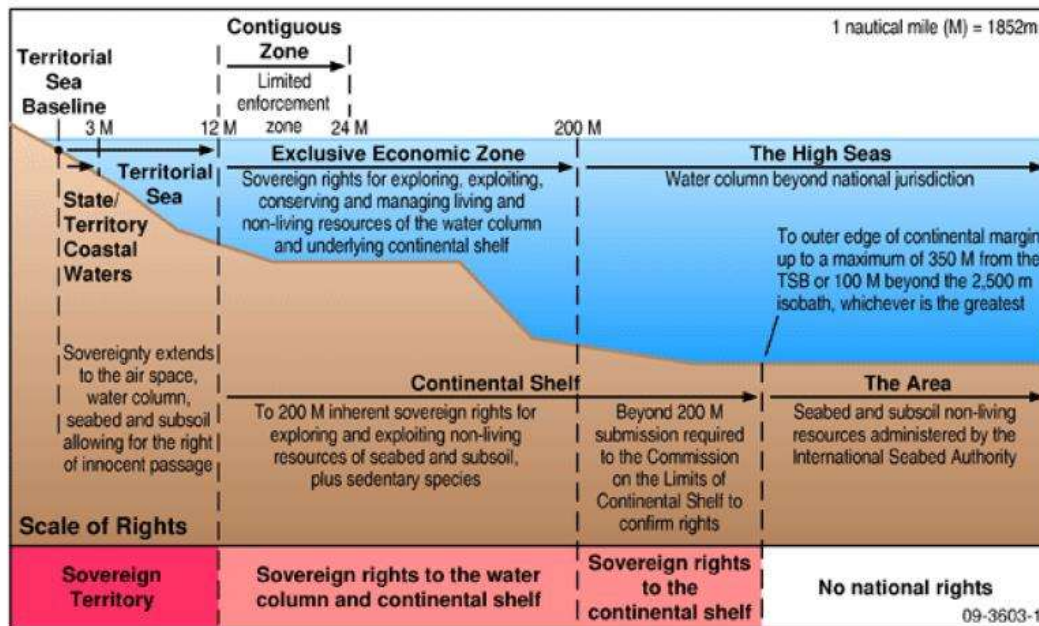
Figure 4. Slide from the presentation. Marine Domain Perspective.

Data Centric Operations and Workflows

Data is the second most important asset in an organization after the people. Data therefore needs to be treated as an enterprise-wide, national and even global asset with tremendous intrinsic value, not only to the organization that captures and/or manages it, but to other potential users as well. In the maritime sector we have been promoting the term "collect once, use many times" for many years in respect of the wider value and utility of, for example, bathymetry data. However, there is other important data held by the HO that has additional or residual value once it has been used to support the business of charting. The terms "data centric" and "With a data centric approach" define operations and workflows that are managed as close to "source" as possible rather than as products. Enabling efficient data sharing, exchange and re-use across government, academia, and commerce thereby stimulates economic and socio-economic benefits, not only to the nation, but potentially across borders with neighboring HOs.

UN-GGIM WORKING GROUP ON MARINE GEOSPATIAL INFORMATION

The principal purpose of the UN-GGIM is to play a leading role in setting the agenda for the development of global geospatial information management and to promote the use of geospatial information in addressing key global challenges, particularly taking into account the role of geospatial data in monitoring and achieving the Sustainable Development goals agreed under the UN 2030 Agenda for Sustainable Development. The UN-GGIM reports to the UN General Assembly via the UN Economic and Social Council (ECOSOC).

At the seventh Session of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) that took place at the UN Headquarters in New York, USA from 31 July to 4 August 2017 it was decided to establish an UN-GGIM Working Group on Marine Geospatial Information (MGIWG). The MGIWG will provide input to the Committee to support its Member States in developing national policy, strategic priorities, decision-making and the monitoring of global developments in relation to their spatial data infrastructures and marine geospatial information management. It should be noted that although the IHO has been recognised as having a fundamental role in marine geospatial information, the terms of reference of the WG indicate a scope well beyond hydrography. The WG is expected to play a leading role at the policy level by raising political awareness and highlighting the importance of reliable, timely and fit-for-purpose marine geospatial information to support the administration, management and governance of the marine environment. It is anticipated that the WG will consider the full range of maritime geospatial information, including met-ocean data.

The UN-GGIM Secretariat has identified the co-Chairs and participation to the UN-GGIM: MGIWG.

The first on-line meeting took place on 26 March 2018. It is anticipated that the first meeting of the MGIWG will take place immediately prior to the next session of the UN-GGIM. The eighth Session of UN-GGIM will take place at the UN Headquarters in New York during the first week of August 2018. The MSDIWG will be represented by several MS.

Draft Guidance for Data Licensing
It is widely recognised that significant creative and economic potential may lie dormant in data locked up and not released on terms allowing re-use. The concepts behind MSDI recognise the potential held in data. However, if data is to be re-used by third parties it needs to be licensed.
The Hydrographic Data Policy Best Practise Guidelines for Hydrographic Offices white paper states 'fit for purpose hydrographic data and information is essential in underpinning evidence based decision making and asset management enabling governments and the commercial sector to deliver their policy objectives for the marine environment and coastal zone'. The paper points out the 'use of this data outside of navigational products has been limited, but the requirement is growing very swiftly across the world'.
A data license provides users with legal clarity on how data can be used as well as defining user obligations. In most jurisdictions there are intellectual property rights that prevent third parties from using, reusing and redistributing data without explicit permission. Even if data is publically available, without a license a user may not have permission to access, use, or share it due to copyright laws. By applying an open license, you enable users the freedom to use your data to experiment, explore and innovate. Attached in Annex E there is a first Draft of Guidance for Data Licensing. The intension is to finalize the draft version at then next MSDIWG10 meeting in 2019.

Marine Spatial Planning
EU has published a directive of the European Parliament and of the Council
dealing with establishing a framework for maritime spatial planning and integrated coastal management. The main purpose of the directive is to promote the sustainable growth of maritime and coastal activities and the sustainable use of coastal and marine resources by establishing a framework for the effective implementation of maritime spatial planning in EU waters and integrated coastal management in the coastal areas of Member States.
The proposal establishes a framework for maritime spatial planning and integrated coastal management in the form of a systematic, coordinated, inclusive and trans-boundary approach to integrated maritime governance. It obliges Member States to carry out maritime spatial planning and integrated coastal management in accordance with national and international law. The aim of the action is for Member States to establish a process or processes that cover the full cycle of problem identification, information collection, planning, decision-making, management, monitoring of implementation, and stakeholder participation.
Implementing acts will ensure consistent implementation of the Directive throughout the EU and facilitate reporting from the Member States to the Commission and, where relevant, the exchange of data between Member States and with the Commission. Article 10 in the proposed directive especially focuses on data collection and exchange of information. Article 12 and 13 describes Cooperation with other Member States and third countries.
As seen from a HO perspective a MSDI could support such varied activities as coastal zone management planning and maritime spatial planning including the management of energy production at sea, fishing, marine environmental protection and nature conservation, planning charts, navigation, civil and military preparedness, tourism, and maritime spatial planning.

6. Conclusions and Recommended Actions
A well-functioning MSDI ensures that relevant maritime authorities can contribute their spatial information and related updates, and that this information can easily be collected with other information to generate a current, overall picture. As a result, MSDI can support such varied activities as coastal zone management, planning of energy production at sea, fishing, marine environmental protection and nature conservation, planning charts, navigation, civil and military preparedness, tourism, and maritime spatial planning.

From a MSDI perspective it is important that the MS should be the "providers of choice" for authoritative foundational marine/maritime information through engagement and participation in MSDI in addition to their existing navigational role. It is actively strengthening its understanding and knowledge of the role of hydrography in MSDI through its outreach programmes with other SDI stakeholder groups (such as the European Commission, UN-GGIM, IOC-IODE), globally, and through the IHO MSDIWG across the HO community. The IHO is a great advocate of MSDI and the need for change stating, along with other stakeholders, that unless MS acts others will provide the authoritative data and in doing so potentially weaken the status of HOs.

From a more practical approach there is a need for the HO to focus on and strengthen the maritime approach to MSDI and to ensure that maritime information is included. Some of the challenges from an international and regional approach for IHO MS in relation to MSDI are seen as:
- Ensuring that MS participate in the MSDI work
- The creation of new regional MSDIWGs will give the MS direct possibility to actively participate in the development of a well-functioning MSDI within the hydrographic domain and its surroundings, with the possibility to benefit from a national and a regional approach and in that way take the lead in addressing regional MSDI matters for the countries in the region.
- Ensuring that regional MS HO have the possibility to contribute to the development of the regional MSDI
- Ensuring the use of data/information provided by HO is fit for purpose for wider dissemination
- Establishing access to Best Practises related to SDI/MSDI

7. Justification and Impacts
The work in the MSDIWG is well underway and a new Work Programme and a supporting Action Plan has been established. The new Work Programme will establish the framework for the WG, in order to cope with the challenges in a forward-looking perspective.
The creation of new regional MSDIWG will give the MS direct possibility to actively participate in the development of a well-functioning MSDI within the hydrographic domain and its surroundings with the possibility to benefit from a national and a regional approach and in that way take the lead in addressing regional MSDI matters for the countries in the region.

8. Action Required of IRCC
The IRCC is invited to:
   a. note the report
   b. approve the work programme
   c. discuss how the MSDIWG should deal with marine Spatial Planning in the future
   d. discuss any item with relevance to SDI/MSDI and to take appropriate actions.

Annex A

Marine Spatial Data Infrastructures Working Group (MSDIWG)

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(8 May 2018)

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MSDIWG Proposed Work Plan - 2018 to 2021

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 Maturity Assessments (national and regional) to enable consistent reporting from MS through RHC to IRCC.	H	1. Design template(s) 2. Assessment templates in place 3. Assessment templates in use	Jun 17	Jan 19	O	Denmark, OceanWise		Items 2 & 3 OceanWise send templates to WG MS for comment
A.2	Identify definitions, appropriate and relevant standards and components of (M)SDI. Ref: D1 and D2	H	1. Provide a consolidated list of definitions, components, standards	Jan 17	Jan 18	C	Malaysia		
A.3	Develop and provide guidelines on MSDI implementation.	M	1. Guidelines in place based on outputs from tasks B1-3: C2	2017	2019	O	IIC OceanWise Canada		
A.4	Develop MS or RHC relevant Case Studies. Ref: C2	M	1. Arctic Region 2. Baltic Region 3. Brazil 4. East Asia Region	2017 2017 2018 2018	2019 2019 2020 2021	P	USA Denmark Brazil Korea		Awaiting template
A.5	Create video recording of MSDI for HO and wider marine community .	M	1. Develop content: a. Messages from C-17 b. Key points of MSDI c. Role of MSDIWG 2. Edit 3. Record	Mar 17	Jan 19	O	Korea		Video out for WG MS for review. Spanish version requested

			4. Edit 5. Approve						
B.1	Create an implementation "roadmap" template for MSDI (at national and/or regional level)	H	1. Gather information 2. Compile information 3. Publish template for implementation	Mar 17	Dec 18	O	IIC Esri USA		USA NGA comment req'd
B.2	Identify core data for input to MSDI to support multiple applications [Ref: B1]	M	1. Marine Cadastre 2. Emergency Response 3. Coastal Zone Management	Mar 17	2019	O	IIC Germany Canada OceanWise		OceanWise to circulate
B.3	Identify wider user requirements for bathymetry data	H	1. Develop primary use case for Arctic Bathymetry SDI 2. Update concept development study ($) 3. Propose test-bed 4. Build test-bed ($)	2017	2018	O	OGC USA (NGA)		
C.1	Draft data policy statements for MSDI (Ref:A3)	M	1. Define relevant statements 2. Compile compendium of Data Policy statements	2017	2019	P	USA OceanWise		
C.2	Develop a conceptual architecture for MSDI	M	1. Develop architecture(s) 2. Compile compendium of MSDI architectures	2017	2018	C	Malaysia		
C.3	Develop a governance model for MSDI	M	1. Deliver best practice governance models to BoK (Ref: B3)	2017	2019	O	Denmark USA (NGA)		
C.4	Data Sharing and Publishing Licence	M	1. Provide licensing models and templates as 'best practice' to MSDI BoK	2018	2019	O	NZ, USA, OceanWise, Indonesia, Malaysia Esri		
D.1	Identify relevant standards to support MSDI implementation and operation.	H	2. Provide annual reports to IRCC and HSSC 3. DGGS (Ref: B3)	Jun 17	Jan 20	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: B3) 2. Marine Cadastre Oceanography	2018	2019	O	OGC Marine DWG (inc: Portugal)		

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	2019	O	Esri OceanWise USA Portugal Caris		
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	2018	2019	O	OceanWise UK US (NGA)		
F.1	Develop and maintain training syllabi	M	1. Review and update in line with relevant developments, methods and content	2018	2020	O	Denmark OceanWise		
F.2	Support development and delivery of e-learning platforms	L	1. Coordinate activities with East Asia (KHOA) 2. Compile list of existing e-learning modules relevant to MSDI	2018	2020	O	Esri OceanWise KHOA		
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	2020	P	IHO NZ(LINZ) Netherlands US (NOAA)		
G.1	Maintain IHO publication C-17 to reflect developments in ICT, Content, Standards and Governance of MSDI	H	1. Manage on-line dynamic content 2. Create a Wiki 3. Request IRCC remove document from IHO Res: 2/2007	2017	2020	O	OceanWise Esri USA Denmark Germany Portugal		V2.0 now approved by IRCC
H.1	Conduct 2019 -21 meetings of MSDIWG, arranged back to back with 1-day MSDI Open Forum and OGC Marine DWG	H	1. Date and venue defined 2. Logistics in place 3. Open Forum programme defined 4. Develop content for DWG workshops	2017	2021	O	MSDIWG Management Group (Chair/Vice Chair, Sec, IHB)		2019- ROK: 2020- Germany; 2021 - Singapore

Abbreviations:
  1) **Priority:** H-high, M-medium and L-low
  2) **Status:** P-planned, O-ongoing and C-Completed

Annex C

9th MEETING OF THE IHO MARINE SPATIAL DATA INFRASTRUCTURES
WORKING GROUP (IHO-MSDIWG9)

Niteroi, Brazil, 30 January-1 February 2018

LIST OF ACTIONS
(Approved by MSDIWG -9 Attendees)

Action Items	Responsible	Status/Date
Action 3/2017: Request that IRCC consider making C-17 v2.0 dynamic in nature enabling new information to be made available in a timely manner.	Chair, IHO Secretariat	Ongoing
Action 4/2017: Submit an input paper to HSSC10 outlining options for the development of DGGS.	OGC Marine DWG	May 2018
Action 5/2017: Provide report to MSDIWG 10 on S-102 Scientific implementation plan	Germany	February 2019
Action 6/2017: Provide ideas to IHO Secretariat on how the IHO website can enable "one click" access of information via a dedicated web address.	Chair/Secretary, IHO Secretariat	Jan 2019
Action 15/2017: Draft letter to all RHC Chair's through IRCC providing a list of MSDI reporting requirements (to include Maturity Assessment template).	Chair	To be part of WG report to IRCC11
Action 16/2017: Investigate the use of 'GoToMeeting' at future MSDIWG meetings to increase levels of remote participation. The host nation would be responsible for facilitating this if feasible. Instructions on how to do so are on the IRCC website.	IHO Secretary/RoK	February 2019
Action 1/2018: Provide Case Study template for future use by MSDIWG Members.	Vice Chairman	IRCC10
Action 2/2018: IHO MSDIWG to be included in development of new terms of reference for CSBWG and its report.	Chair	Ongoing
Action 3/2018: Gather material on data licensing, education, training and capacity building for MSDI BoK.	IHO Secretariat	Ongoing
Action 4/2018: MSDI case studies: provide 500 word (maximum) examples for MSDI BoK.	Malaysia, Indonesia Germany, RoK, USA	30 June 2018
Action 5/2018: MSDIWG MS to investigate their participation in the United Nations Global Geospatial Information Management (UN-GGIM) Marine Working Group and report back to US (NOAA).	All	July 2018
Action 6/2018: Report outcomes from UN-GGIM Marine WG to MSDIWG-10 in 2019.	Chair, USA	January 2019
Action 7/2018: WG Members to present on their role in Marine Cadastre to RHC's and MSDIWG-10.	All	MSDIWG10

Action 8/2018: Provide as part of the report to IRCC10, recommendations that HO's join or engage with OGC and outline the benefits of doing so.	Chair/Secretary	March 2018
Action 9/2018: Distribute MSDI Maturity Assessment template to MSDIWG members for review and comment.	Secretary	March 2018
Action 10/2018: RoK to provide link to MSDI video to WG members to review and comment. Responses to IHO Secretariat.	RoK, IHO Secretariat	1 March 2018
Action 12/2018: Vision for MSDIWG. WG members to review draft vision document for submission to IRCC-10 and IHO Strategic Plan.	Vice Chair	March 2018
Action 13/2018: C-17; provide a development plan on future status, updating and publishing to IRCC-10.	IHO Secretariat	1 March
Action 14/2018: Submit a 'White Paper' to IRCC-10 on the importance of Data Assurance to MSDI data sharing and exchange.	UK USA Italy	March 2018
Action 15/2018: Ensure subject of Data Assurance is included in MSDIWG Report to IRCC-10.	Chair	March 2018
Action 17/2018: Prepare a Data Licensing 'best practise' framework for MSDI BoK.	New Zealand, OceanWise, RoK, Malaysia, Indonesia	Summer 2018
Action 18/2018: Cables: Ensure the subject of cables is part of the MSDIWG Report to IRCC-10 and for IRCC to recommend how this might be considered in IHO.	Chair	March 2018
Action 19/2018: Include 'economic impacts' of MSDI with respect to hydrography in the MSDI BoK. MSDIWG MS to send relevant reports and case studies for BoK.	All IHO Secretariat	MSDIWG10
Action 20/2018: Prepare MSDI template policy statements for discussion at MSDIWG-10.	USA, OceanWise	October 2018
Action 21/2018: Provide governance guidance through a step-by-step model. Upload to MSDI BoK.	USA (NGA), Denmark	MSDIWG10
Action 22/2018: OGC to revisit standards content in MSDI BoK and update as necessary.	OGC IHO Secretariat	MSDIWG10
Action 23/2018: Special Publication No. S-98; All MSDIWG Members to send comment and to respond to MSDIWG Chair.	All, Chair	10 Feb 2018
Action 24/2018: MSDIWG Members to provide reports on innovation and future MSDI trends to MSDIWG-10.	Expert Contributors	March 2019
Action 25/2018: Esri and OceanWise to provide links to their e-Learning sites.	Teledyne CARIS, Esri, OceanWise	MSDIWG10

Action 26/2018: RoK to prepare proposal for the provision on an e-learning platform for the MSDI BoK for MSDIWG 10.	RoK IHO Secretariat	March 2019
Action 27/2018: Develop an MSDI Communications Plan for IHO MSDI BoK.	Netherlands, New Zealand, US [NOAA] IHO Secretariat.	MSDIWG10
Action 28/2018; Republic of Korea will host MSDIWG-10, Open Forum and OGC MDWG in Q1 2019 in Busan. WG-11: 2020 – Germany (tbc) WG 12: 2021 – Singapore (tbc)	RoK	Confirmed
Action 29/2018: Provide a MSDI reporting template for each RHC to be used by the RHC Chairs.	Chair/Secretary	MSDIWG10
Action 30/2018: Distribute MSDI Maturity Assessment regional template to MSDIWG members for review and comment.	Secretary/Vice Chair	February 2019

Annex D MSDI Template.

International Hydrographic Organization (IHO)
Marine Spatial Data Infrastructures Working Group (MSDIWG)
MSDI Case Study Summary Information Sheet

Case Study
Click Here To Enter Case Study Title
Case Study Type: Click here to choose an item.
Summary
Click here to answer: What is the subject/topic/focus of this case study? (approx. 25 words)
Click here to answer: When and why was it produced/what is its purpose or intended use? (approx. 100 words)
Click here to answer: How is it relevant to MSDI (e.g., list details related to specific MSDI components, access best practices, focus: national/regional/international)? (approx. 200 words)
Click here to answer: Are there any limitations (e.g., restricted access, intended use, licensing)? (approx. 50 words)
Click here to answer: Who are the users or intended users? (approx. 25 words)
Click here to answer: Identify specific recommendations on how the resource could be used, or how users could benefit from the resource. (approx. 100 words)

Sources: Click here to provide URLs for this case study's source.
Submitted by: Click here to provide name.
Click here to provide title.
Click here to provide affiliation.
Click here to provide contact information (e.g. email address).
Date Submitted: Click here to enter a submission date.
Data Governance & Infrastructure Components Exemplified by Case Study:
(Checked ☑ components apply.)

☐ Access, Data Sharing & Exchange
☐ Data Assurance
☐ Data Quality
☐ Documentation
☐ Information Control Technologies
☐ Interoperability
☐ Policy & Organization, Strategy
☐ Quality Control Procedures
☐ Standards
☐ Storage
☐ User Needs & Response

Annex E Draft Guidance for Data Licensing

International Hydrographic Organisation
Marine Spatial Data Infrastructures Working Group (MSDIWG)

Guidance for Data Licensing
Draft v0.1 – April 2018

1.   Context

The MSDI working group was contacted by a member IHO state seeking guidance on data licensing. This paper aims to provide advice on data licensing to promote the advancement of Marine Spatial Data Infrastructures (MSDI).

2.   Concepts

To avoid confusion between the authors and the readers, it is firstly important to ensure a common base of concepts and terminology.

2.1 Defining *Spatial Data Infrastructure*:

A Spatial Data Infrastructure (SDI) is a collection of technologies, policies and institutional arrangements that facilitate the availability of and access to spatial data[1].

A SDI facilitates the sharing of data, by removing duplication associated with the generation and maintenance of geospatial information and supports integration with other datasets. This leads to the development of innovative business applications, greater efficiencies in the public and private sector and provides better information to support decision making.

2.2 Defining *Marine Spatial Data Infrastructure*:

MSDI is a specialised spatial data infrastructure that encompasses all marine geographic and business information, for those working in the maritime and marine environment. Typical data includes marine boundaries, conservation and preservation areas, marine habitats, oceanography, bathymetry, hydrography, geology, marine infrastructure, wrecks, offshore installations, pipelines and cables.

2.3 Defining *License*:

A permission accorded by a competent authority, conferring the right to do some act which without such authorisation would be illegal, or would be a trespass or a tort[2].

Licenses typically grant permissions on condition that certain terms are met. While the precise details vary, three conditions commonly found in licenses are attribution, share-alike, and non-commerciality.

- An **attribution** requirement means that the licensor must be given due credit for the work when it is distributed, displayed, performed, or used to derive a new work.
- A **share-alike** requirement means that any new works derived from the licensed one must be released under the same license, and only that license.

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[1] IHO: The Hydrographic and Oceanographic Dimension to Marine Spatial Data Infrastructure Development: Developing the capability
https://www.iho.int/mtg_docs/com_wg/MSDIWG/MSDIWG_Misc/Marine_SDI_Documents/MSDI_white_paper.pdf
[2] https://thelawdictionary.org/license/

- The intent of a **non-commercial** license is to prevent the licensee from using the work commercially.

2.4 Defining Open *Data*:

'Open data' means data which is available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control. Open data and content can be **freely used, modified, and shared** by **anyone** for **any purpose**[3].

The Open Definition sets out principles that define "openness" in relation to data and content including:

- **Availability and Access**: the data must be available as a whole, and at no more than a reasonable reproduction cost, preferably by downloading over the internet. The data must also be available in a convenient and modifiable form.
- **Re-use and Redistribution**: the data must be provided under terms that permit re-use and redistribution including the intermixing with other datasets.
- **Universal Participation**: everyone must be able to use, re-use and redistribute - there should be no discrimination against fields of endeavour or against persons or groups. For example, 'non-commercial' restrictions that would prevent 'commercial' use, or restrictions of use for certain purposes (e.g. only in education), are not allowed.
- Open Data does not mean 'free of charge' data.

3. Why data needs to be licensed

It is widely recognised that significant creative and economic potential may lie dormant in data locked up and not released on terms allowing re-use. The concepts behind MSDI recognise the potential held in data. However, if data is to be re-used by third parties it needs to be licensed.

The *Hydrographic Data Policy Best Practise Guidelines for Hydrographic Offices* white paper states 'fit for purpose hydrographic data and information is essential in underpinning evidence based decision making and asset management enabling governments and the commercial sector to deliver their policy objectives for the marine environment and coastal zone'. The paper points out the 'use of this data outside of navigational products has been limited, but the requirement is growing very swiftly across the world'[4].

A data license provides users with legal clarity on how data can be used as well as defining user obligations. In most jurisdictions there are intellectual property rights that prevent third parties from using, reusing and redistributing data without explicit permission. Even if data is publically available, without a license a user may not have permission to access, use, or share it due to copyright laws. By applying an open license you enable users the freedom to use your data to experiment, explore and innovate.

4. Selecting a license

Data licenses exist on a spectrum from being completely open to being very restrictive. The type of license an organisation assigns will depend on the policies of the individual organisation.

While some governments and organisations develop their own standard licenses and custom licenses, others adopt internationally recognised licenses such as Creative Commons, or Open Data Commons.

If your organisation is new to open data, you may want to first consider developing an open data policy. Other things you need to consider before selecting a license include:

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[3] https://opendefinition.org/

[4]

https://www.iho.int/mtg_docs/com_wg/MSDIWG/MSDIWG_Misc/Marine_SDI_Documents/SDI_Hydrographic _Data_Policy.pdf

- Do you want to allow commercial use?
- Do you want to allow derived works?
- Do derived works require the same license?

When assigning a license it is also important to ensure it is easy to access and easy to read.

5. Standard Licenses

The table below describes Creative Commons and Open Data Commons standard licenses, describing which licenses confirm to the Open Data Definition and other criteria relevant to selecting a license.

License	Confirm to *Open Data* Definition	Allows commercial use	Allows derived works	Requires same license for derived works (Share-alike)	Requires Attribution (BY)
Creative Commons **CC-BY**	YES	YES	YES	NO	YES
Creative Commons **CC-BY-SA**	YES	YES	YES	YES	YES
Creative Commons **CC-BY-ND**	NO	YES	NO	n/a	YES
Creative Commons **CC-BY-NC**	NO	NO	YES	NO	YES
Creative Commons **CC-BY-NC-SA**	NO	NO	YES	YES	YES
Creative Commons **CC-BY-NC-ND**	NO	NO	NO	n/a	YES
Creative Commons **CC0**	YES	YES	YES	NO	NO
Open Data Commons **ODC-BY**	YES	YES	YES	NO	YES
Open Data Commons **ODbL-BY**	YES	YES	YES	YES	YES
Open Data Commons **PDDL**	YES	YES	YES	NO	NO

For detailed information refer to the Creative Commons[5] website and the Open Data Commons[6] website.

References:

1. Creative Commons https://creativecommons.org/

2. DCC http://www.dcc.ac.uk/resources/how-guides/license-research-data

3. European Data Portal https://www.europeandataportal.eu/elearning/en/module4/#/id/co-01

4. IHO Hydrographic Data Policy Best Practise Guidelines for Hydrographic Offices https://www.iho.int/mtg_docs/com_wg/MSDIWG/MSDIWG_Misc/Marine_SDI_Documents/SDI_Hydrographic_Data_Policy.pdf

5. IHO - The Hydrographic and Oceanographic Dimension to Marine Spatial Data Infrastructure Development: "Developing the capability" https://www.iho.int/mtg_docs/com_wg/MSDIWG/MSDIWG_Misc/Marine_SDI_Documents/MSDI_white_paper.pdf

6. Open Data Commons https://opendatacommons.org/

7. Open Definition https://opendefinition.org/guide/data/

8. Open Knowledge International https://okfn.org/opendata/

9. Open Data Support – European Union by PWC https://joinup.ec.europa.eu/sites/default/files/document/2015-05/d2.1.2_training_module_2.5_data_and_metadata_licensing_v1.00_en.pdf

10. Standford Libraries https://library.stanford.edu/research/data-management-services/share-and-preserve-research-data/licensing

11. The law dictionary https://thelawdictionary.org/license/

12. The Open Data Institute https://theodi.org/knowledge-opinion/guides/