

# Report on the Marine Spatial Data Infrastructures (MSDI)

(Adapted from the presentation made by the MSDIWG Chair to IRCC10)



# Principal activities and achievements

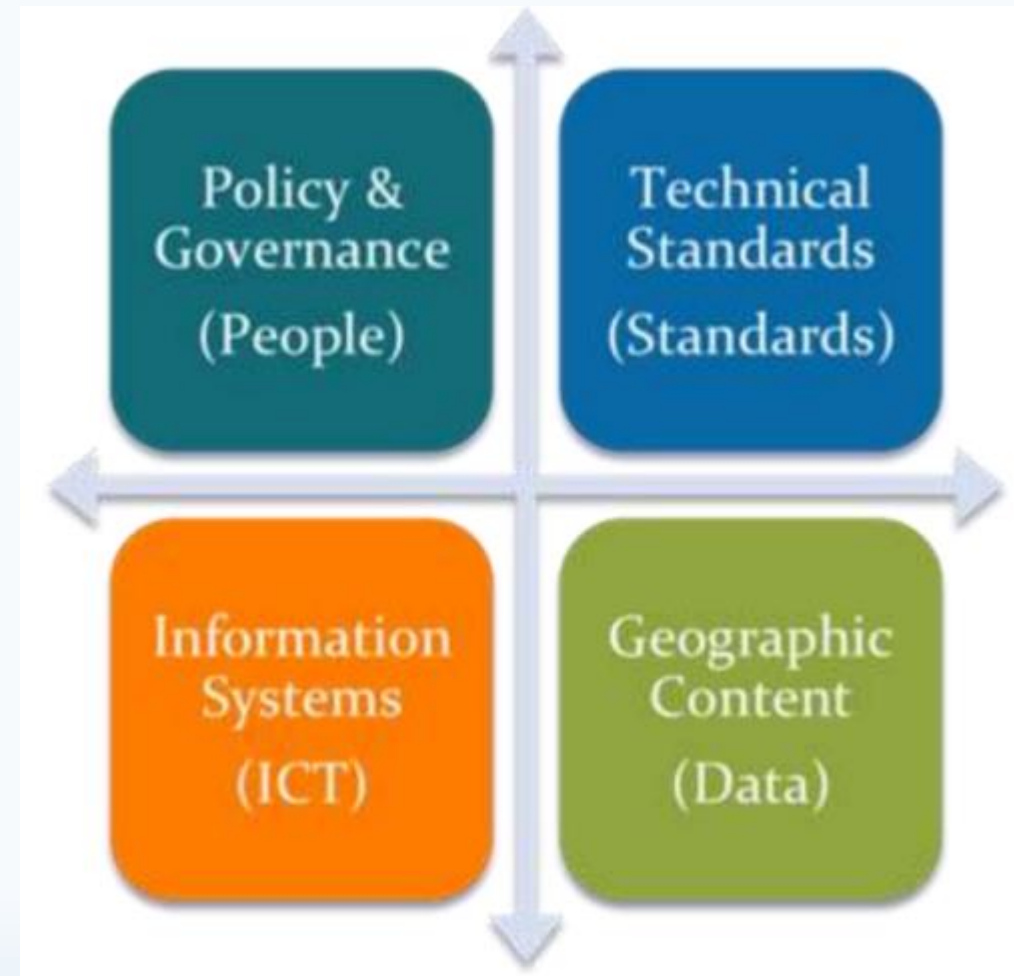
The MSDIWG9 meeting took place in Niteroi (Rio de Janeiro), 30 January – 1 February 2018. The MSDIWG meeting was preceded firstly on 29 January by a MSDI Open Forum and after the MSDIWG9 meeting on the 2 February 2018 an OGC Marine Domain WG was arranged.



# Principal activities and achievements

## MSDIWG9 topics:

- Information on MSDI implementation from MSDIWG members
- IHO strategic plan and establishing a draft IHO MSDI vision 2025/2030
- MSDI e-learning
- Improving the availability of bathymetric data Worldwide
- UN-GGIM and the marine domain
- Security and integrity of data



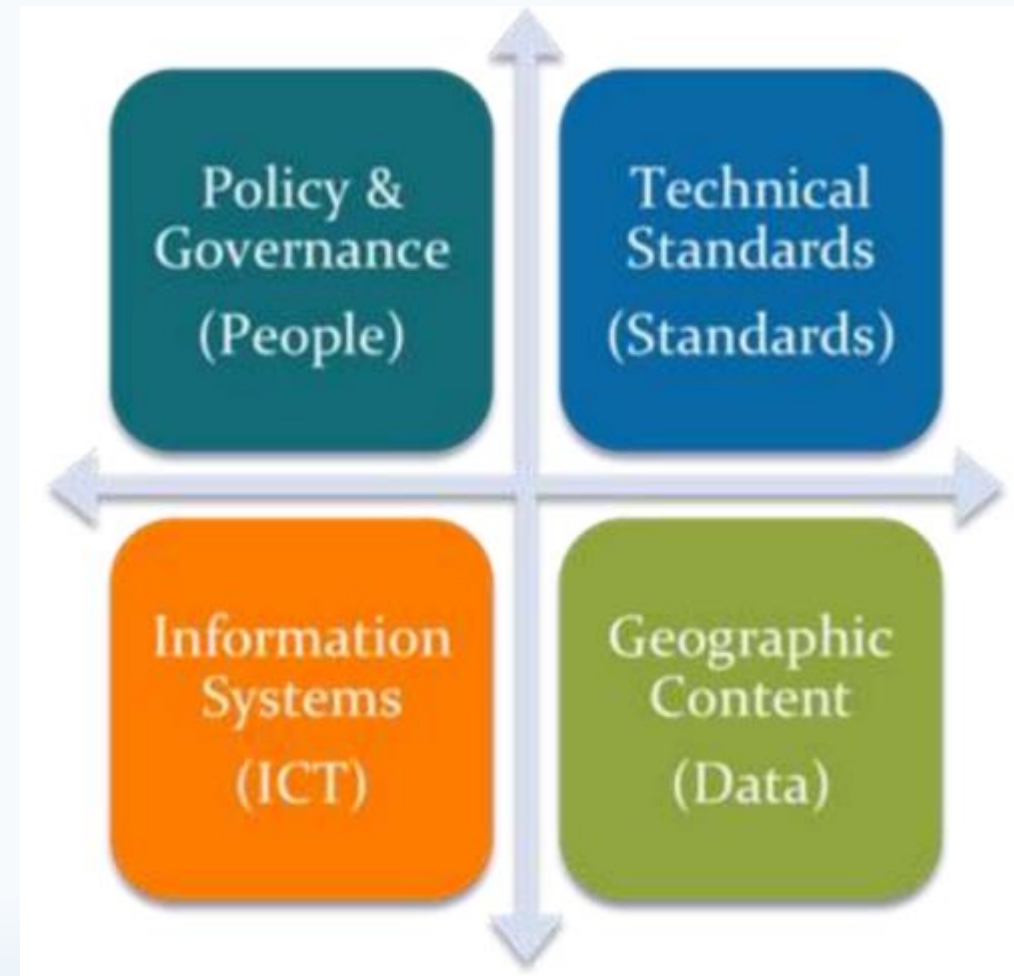
The four basic components of MSDI



# Principal activities and achievements

## MSDIWG9 topics:

- Update of C-17 (Edition 2)
- The IHO/OGC conceptual study for a MSDI
- Spatial Data Quality
- Connection of S-100 with MSDI
- Cooperation with the International Cable Protection Committee
- Cooperation with OGC
- Revision of the MSDIWG Work Plan



The four basic components of MSDI



# Principal activities and achievements

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## Next Planned Meeting:

### MSDIWG10

The IHO/MSDIWG will hold:

- a three day-long MSDIWG10 meeting,
  - a one-day MSDI Open Forum, and
  - a one-day OGC Marine Domain WG meeting
- in Busan, Republic of Korea, from 4 to 8 March 2019.

Logistics and meeting details will be available at: [www.iho.int/msdiwg](http://www.iho.int/msdiwg)





# Principal activities of the Work Plan

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- |          |   |
|----------|---|
| <b>A</b> | Communication and dissemination   |
| <b>B</b> | Operational - Data sharing and management   |
| <b>C</b> | Policies and governances – Ensure that MSDI is a standing agenda item for RHCs' meetings (IHO Res 2/1997, as amended, refers) |
| <b>D</b> | Standards (OGC and HSSC)  |
| <b>E</b> | Innovation – Future perspectives (2021 - 2023)  |
| <b>F</b> | Training and education  |
| <b>G</b> | Maintain and extend the publication IHO MSDI C-17 (IHO Task 3.9.2.1 refers)   |
| <b>H</b> | Conduct annual meetings of MSDIWG, arranged back to back with 1-day MSDI Open Forum (IHO Task 3.9.1 refers)                   |
|          |   |



# Principal activities and achievements

## Information on MSDI implementation from MSDIWG members



## 02 Report Content

### Part 4 Service System



## Agencies' Needs and Data Types

Agencies' Needs:	Agencies	Agencies' Data into GeoSpace-Sea:
Shipping, Navigation, Sea Space & Port Planning, Sea Space Optimisation	MPA	Hydrography, coastlines, tidal levels, vessel information, port accreditation (tolls, dredging, port facilities)
Land and seaplane planning	URA	Urban Master Plan maps, submarine cable landing points
Commercial waterfronts planning and usage, recreation	JTC	Commercial waterfront - quays and mooring lines, bathymetry and seabed material type for reclamation
Reclamation	HDB	Hydrography and seabed material type for reclamation
Marine science research, marine biodiversity	NParks	Berth, coral, sea grass, bio-diversity data
Desalination plants, sewerage outfalls	PIIR	Desalination plants intake/outfall pipes, sewerage discharge points, submarine pipelines
Marine water quality assessment	NEA	Marine water quality - chemical, physical, biological data
Mariculture	AVA	Location of fish farms sites
Erosion impact assessment, coastal profile lines	DCA	Topographic survey
<ul style="list-style-type: none"> <li>Variety of needs which require overlapping/multiple data types</li> <li>Integrate into a single infrastructure for interoperability and visualisation</li> </ul>		



# Principal activities and achievements

## MSDI Body of Knowledge:

[www.iho.int/msdiwg](http://www.iho.int/msdiwg) > Body of Knowledge



The screenshot shows the IHO website with the MSDIWG section highlighted. The left sidebar contains a navigation menu with a red arrow pointing to 'Body of Knowledge'. The main content area displays the MSDIWG page in both English and French, including the group's objectives, terms of reference, and a list of next and past meetings.

**English**  
**MARINE SPATIAL DATA INFRASTRUCTURES WORKING GROUP (MSDIWG)**

**Chair:** Mr. Jens Peter HARTMANN (Denmark)  
**Vice Chair:** Mr. Sebastian CAVESIO (USA)  
**Secretary:** Mr. John PEPPER (John Pepper Consult.)

**Objectives:**  
Identify the Hydrographic Community inputs to National Spatial Data Infrastructures (NSDI). More details can be found in the full Terms of Reference for MSDIWG.  
This group is open to representatives of IHO Member States. Hydrographic Office and, as expert contributors, to entities and organizations that can provide a relevant and constructive contribution to the work of the WG.

**Terms of Reference**  
**Work Plan**  
**Members**  
**MSDIWG Letters**  
**Body of Knowledge**  
**SDI/MSDI portals around the world**

**French**  
**GRUPPE DE TRAVAIL SUR LES INFRASTRUCTURES DE DONNÉES SPATIALES MARITIMES (MSDIWG)**

**Président:** M. Jens Peter HARTMANN (Danemark)  
**Vice-Président:** M. Sebastian CAVESIO (USA)  
**Secrétaire:** M. John PEPPER (John Pepper Consult.)

**Objectifs:**  
Identifier les contributions de la communauté hydrographique aux infrastructures de données spatiales nationales (NSDI). On peut trouver de plus amples détails dans le mandat du MSDIWG.  
Le participation à ce groupe est ouverte aux représentants des Services hydrographiques des États membres de l'OHI et, en qualité de collaborateurs experts, aux entités et organisations qui peuvent fournir une contribution pertinente et constructive aux travaux du GT.

**Mandat**  
**Programme de travail**  
**Membres**  
**Lettres MSDIWG**  
**Le corpus de connaissances**  
**Portails SDI/MSDI dans le monde**

**Next Meetings**

Meeting	Documents
MSDIWG10 - Busan, Republic of Korea (4-8 March 2019, exact dates TBD)	Documents
MSDIWG11 - Germany (2020, exact dates and venue TBD)	Documents
MSDIWG12 - Singapore (2021, exact dates and venue TBD)	Documents

**Past Meetings**

Meeting	Documents
MSDIWG9 - Nairobi, RI, Kenya (10 January-1 February 2015)	Documents
MSDIWG8 - Vancouver, Canada (20 January 2015) and OGC Marine Domain Working Group (2 February 2015), in conjunction with MSOWG2	Documents
MSDIWG7 - Vancouver, Canada (31 January-2 February 2017)	Documents
MSDIWG6 - Vancouver, Canada (31 January-2 February 2017)	Documents





# Principal activities and achievements

## Communication and dissemination



[Link to the video on MSDI](#)



# Security and Integrity

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- Security
  - Unauthorised use (e.g stealing a car, downloading a pirate movie)
  - To demonstrate “authorised use” some form of “permission” is required.
- Integrity
  - Who sent me this? Is it complete?
  - Different from “is it correct?”
- Different concepts.
- In MSDI often integrity has a higher priority than security.
- Why? Because often MSDI is built with the express purpose of promulgating data so most (not all) use is “authorised”

The conclusion we came to was the issue is “integrity” which relies on two things, knowing who a piece of data came from and the knowledge that it has not changed in its journey to the end user. This is also dealt with by IHO S-63 in the form of its digital signatures.



# Security and Integrity - The issue within the MSDI community

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## Where are the risks?

- Much MSDI data relates to boundaries, administrative, legal, cadastral etc.
- Impact of incorrect reproduction or attribution can be very large.

## Is there a ready-made solution?

- Ongoing need to consider this issue
- Consider existing mechanisms
  - Stream based may not be suitable for “data centric” models
  - IHO S-63 relies on a specific end user system
  - Other standards exist but may need adaptation
  - All require a “trust network” to define identity.



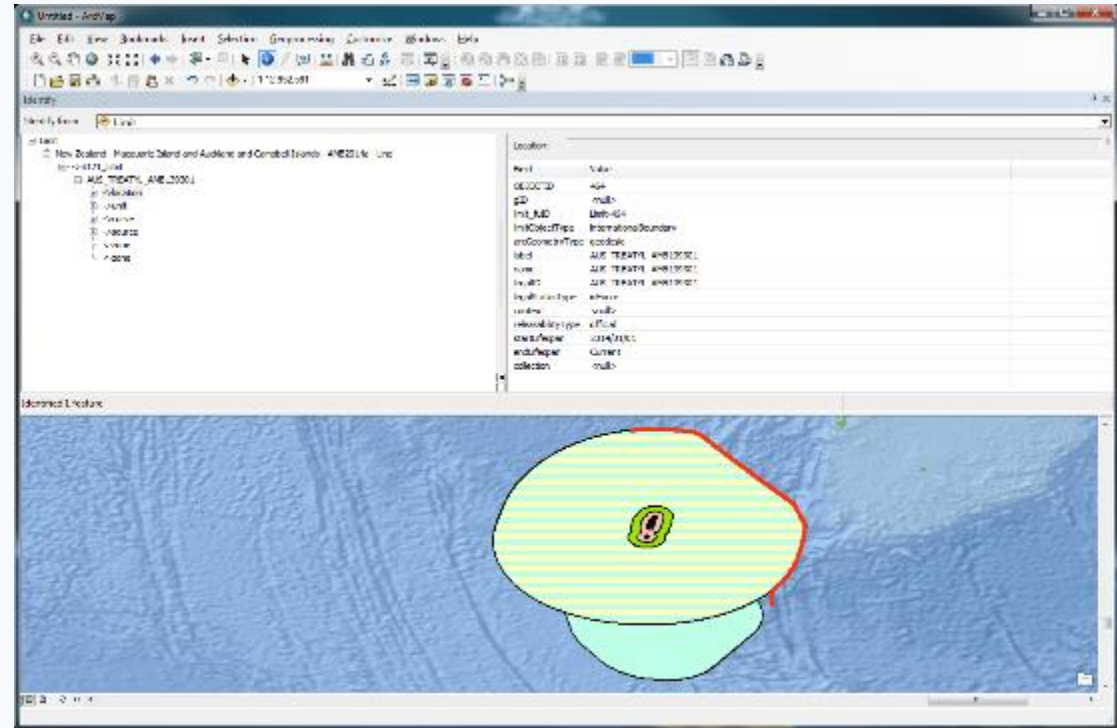
## Security and Integrity - The issue within the MSDI community

## Where are the risks?

Consider that one of the fundamental datasets recently under consideration are UNCLOS maritime limits and boundaries. These datasets are simple, by comparison with the complex geospatial data which make up ENC but their economic and political weight are enormous and the impact of their incorrect reproduction through an MSDI environment is of concern.

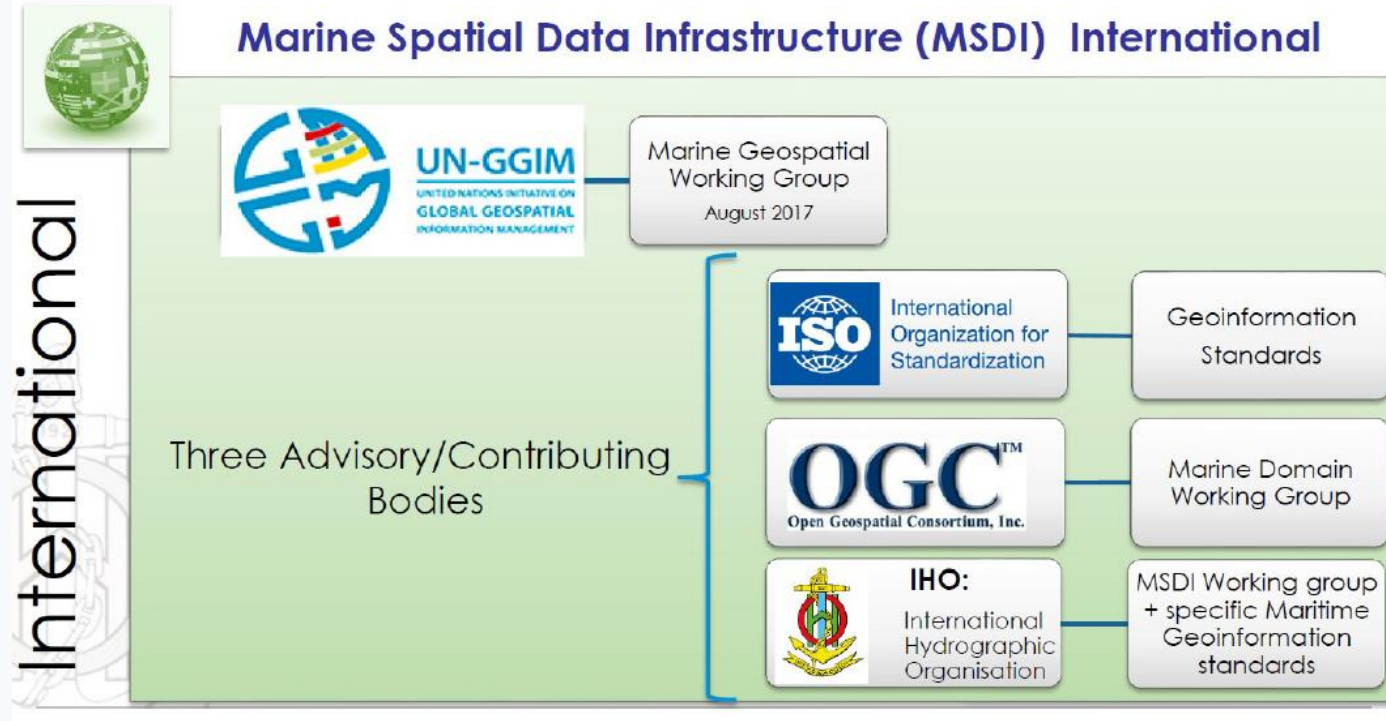
UNCLOS official limits and boundaries are often promulgated alongside other official boundaries such as marine protected areas, fishing zones and many others which define rights and responsibilities as part of a harmonised marine cadastral system.

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





# UN-GGIM - Working Group on Marine Geospatial Information



Statistics Division

TOPICS DATA METHODOLOGY EVENTS PUBLICATIONS ABOUT

UN-GGIM

UN-GGIM Working Group on Marine Geospatial Information

The Committee of Experts on Global Geospatial Information Management (UN-GGIM) at its 7th session, held in New York, 2-4 August 2017, endorsed the establishment of a Working Group on Marine Geospatial Information together with the Terms of Reference.

A key work program of UN-GGIM is to increase significantly the availability of high-quality, timely and reliable geospatial information including for the marine environment in support of national development priorities and the 2030 Agenda for Sustainable Development. Marine geospatial information will be needed to meet the demand for critical analysis when questions of governance, management and coordination pertaining to our inland waters, seas and oceans, and its resources arise. These include spaces for recreation, telecommunication, transportation and natural resources yielding food, medicine, energy and minerals, etc. In addition, this information will play a vital role in measuring, monitoring and mitigating climate risk in our inland waters, seas and oceans. While honoring technologically good practices and currently adopted standards and schemes, the Working Group will work to agree upon appropriate marine spatial data infrastructure and its integration with terrestrial spatial data infrastructures into a national geospatial information infrastructure that will also include standards for mapping the near and ocean, and marine observations. The Working Group will also support the geospatial data management aspects of inland waters.

The Working Group will promote geospatial data interoperability – a key requirement for sustainable development in fields such as inland waters, seas and ocean use planning and administration, construction, water management and hazard assessment.

**A. Co-Chairs**

Harkim Lian  
Mr. Namasudra Kabra, Geographic Institute of Bavaria  
United States of America  
Mr. John Nyberg, National Oceanic and Atmospheric Administration

**B. Objectives**

The objective of the Working Group, as decided at the 7th Session of UN-GGIM, are 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 and ocean environments;
- encourage the use of internationally agreed-upon geospatial information frameworks, schemes, systems and established standards to improve the growing inter-dependent relationships between people and the marine environments; and

**Annual sessions**

Seventh session  
Sixth session  
Fifth session

**Overview**

Mandate  
Aims and Objectives  
Bureau  
Regional Committees  
Expert and Working Groups  
Thematic Groups

**Quick links**

UN-GGIM Events  
Paula Evaristo  
Group of Experts on Geographical Names  
Photo gallery  
UN-GGIM Quarterly Volume 1

**Tweets by @unggim**

UN-GGIM (@UNGIM)  
Check out upcoming @UNGIM events @AG\_GGOS Agenda 2018!

Apr 5, 2018

<http://ggim.un.org/UNGGIM-wg8/> - Reference: IHO Circular Letter 47/2017



International Hydrographic Organization  
Organisation Hydrographique Internationale

# Cooperation with the International Cable Protection Committee


Hydrographic Services and Standards Committee

Report of the  
International Cable Protection Committee  
*Docs: HSSC9-07.12A*

ICPC activities affecting HSSC

Graham Evans ICPC Chairman  
Managing Director EGS Survey Group  
geva@egsurvey.com

International Hydrographic Organization  
Organisation Hydrographique Internationale  
HSSC-9, Ottawa, Canada 6 – 10 November 2017  
International Cable Protection Committee



Deep Seabed Mining – Threat to Uncharted Cables




Nautilus Minerals Deep Sea Mining Equipment

3.7mm cable - No context


International Hydrographic Organization  
Organisation Hydrographique Internationale  
HSSC-9, Ottawa, Canada 6 – 10 November 2017  
International Cable Protection Committee




Clarion Clipperton North Pacific




North Atlantic Ridge




Indian Ocean



Northwest Pacific




International Hydrographic Organization  
Organisation Hydrographique Internationale  
HSSC-9, Ottawa, Canada 6 – 10 November 2017  
International Cable Protection Committee



Action requested of HSSC

- ICPC invites the HSSC to note this report
- ICPC invites the HSSC to note the reorganisation of ICPC Focus Group into expanded ICPC/IHO Working Group
- ICPC invites the HSSC to note the ICPC will work with the IRCC and MDSIWG to further the objectives of the IHO/ICPC MoU
- HSSC to note the commitment of ICPC to complete outstanding action by HSSC-10

International Hydrographic Organization  
Organisation Hydrographique Internationale  
HSSC-9, Ottawa, Canada 6 – 10 November 2017  
International Cable Protection Committee



# Cooperation with the International Cable Protection Committee

## What is the challenges?

- Information about undersea installation is historically a sensitive area
- Deep Sea mining have change the need for protection af undersea installations
- Data approach – access to data, point of data sharing
- Lack of Information about undersea installations in the navigational charts
- Who have the responsibility when a cable is damaged?
- Undersea installations within EEZ and outside EEZ (International waters)
- Cables are not presented in small scale charts (International waters)

## What do we want to archive?

- Safety of undersea installations
- Who has the responsible

## Focus areas:

- The international Sea Bed Authority
- Liability
- Visualization

## What could be done?

- ICPC to establish access to information about undersea installations
- Create awareness about the problem
- Information to RHC and HO
- HO to present cable information in their navigational charts
- Include ICPC in the IHO/OGC pilot
- Visualization of cables, ICPC GIS, IHO GIS, IHO metadatabase, S4xx



Danish Geodata  
Agency

IHO MSDIWG9



# IHO MSDIWG Vision Statement (DRAFT)

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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**.

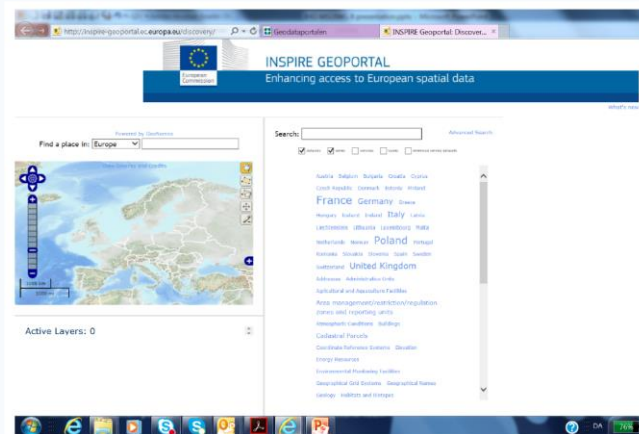
This will **create value, marine knowledge, and enhance decisions** for the **benefit of society**, at **any level** of development, and **sustain the environment**.



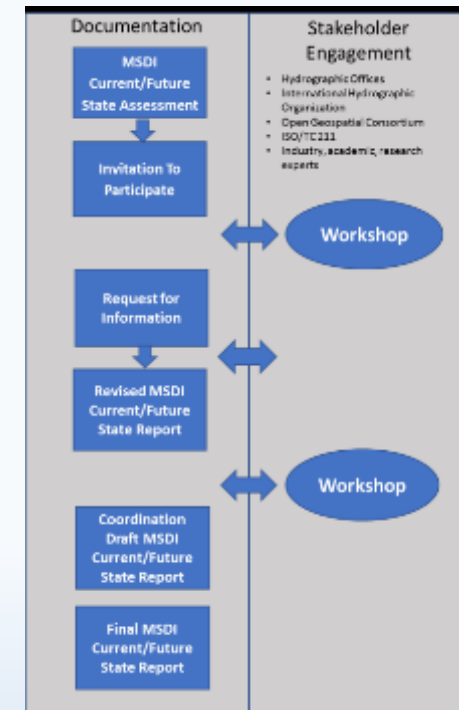
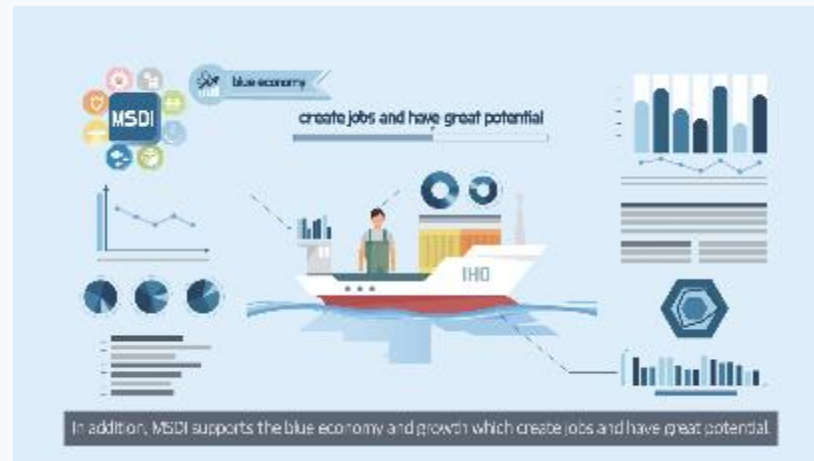


# Future work program

Investigate the possibilities to establish an IHO Metadata platform for Hydrographic data?



Establish a MSDI e-learning platform



IHO OGC MSDI Concept Development Study (CDS)



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# Future work program

Investigate the need and possibilities to use S-58 and S-64 from a MSDI approach.

Is S-58 and S-64 relevant from a S-100 and a MSDI approach?  
If yes, what should the MSDIWG do?

INTERNATIONAL HYDROGRAPHIC ORGANIZATION



IHO TEST DATA SETS FOR ECDIS

Edition 2.0.0 – May 2012

Publication S-64

APPENDIX - INSTRUCTION MANUAL  
FOR ENC TESTS DATA SETS

Published by the  
International Hydrographic Bureau  
MONACO

INTERNATIONAL HYDROGRAPHIC ORGANIZATION



ENC VALIDATION CHECKS

Publication S-58

Edition 6.0.0, May 2017

Published by the  
International Hydrographic Organization  
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Web: <http://www.iho.int>

Establish a Train-the-Trainer workshop/training.

## Question.

Should the MSDIWG establish a Train-the-Trainer workshop?

## Training Objectives

### Training Approach: Train-the-Trainer model

A train-the-trainer workshop can build a pool of competent trainers on MSDI that can then teach material to others.

### Format:

- Watch an experienced instructor teach, (members from different HO)
- Practice hands-on exercises (best practice from different HO)
- Receive some tips and techniques for training
- Apply adult learning theory



International Hydrographic Organization  
*Organisation Hydrographique Internationale*

# OUTCOME OF IRCC10



# Decisions, actions and recommendations from IRCC10

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Decision 17: to task the MSDIWG to:

- follow the development in MSP implementation worldwide,
- establish a list of relevant MS National MSP Data Contact Points and contact persons,
- establish a list of additional relevant institutions, contact person/data experts,
- study the most relevant MSP issues in a cross-border / trans-boundary context in relation to data and information seen from a MS perspective,
- compile minimum requirements for Hydrographic data for Maritime Spatial Plan Data and recommendations of distribution/sharing of this data,
- provide an overview on (national / regional) MSP best practice,
- establish MSP page on the IHO website under the MSDIWG body of knowledge.





# Decisions, actions and recommendations from IRCC10

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Decision 18: to establish the IHO Project Team on the implementation of the UN-GGIM Shared Guiding Principles for Geospatial Information Management (PPT) under the ToR and RoP in doc. IRCC10-07E1.

Action 13: task the IHO Project Team on the implementation of the UN-GGIM Shared Guiding Principles for Geospatial Information Management (PPT) work under its ToR and RoP and to report back to IRCC (deadline: IRCC11).

Action 14: Secretariat to create a web page to present the work of the IHO Project Team on the implementation of the UN-GGIM Shared Guiding Principles for Geospatial Information Management (PPT) (deadline: July 2018).



# Decisions, actions and recommendations from IRCC10

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Action 10: MSDIWG to develop basic MSDI training material in order to allow RHCs to deliver trainings with their own personnel (deadline: IRCC11).



# Examples from other RHCs



# Decisions, actions and recommendations from IRCC10

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## BSHC and NSHC:

Baltic Sea North Sea Marine Spatial Data Infrastructure Working Group

## ARHC:

Arctic Regional Marine Spatial Data Infrastructures Working Group

Arctic SDI

## MACHC:

Marine Economic Infrastructure Program (MEIP)

Portal for GIS data

SDI/MSDI Portals: <https://www.iho.int/gis/msdi.gis.html>





# Action requested of SWPHC16

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## **The SWPHC16 is invited to:**

- note the importance of MSDI to support the objectives of the IHO
- assign a MSDI Ambassador in the region (Action IRCC9/18)
- to participate in the MSDIWG meetings and engage with its work
- to note the examples of other RHCs on MSDI
- discuss any item with relevance to SDI/MSDI and take appropriate actions

