

Sixth expert meeting of the Working Group on Marine Geospatial Information

4 – 8 March 2024

Courtyard by Marriott Bali Nusa Dua Resort, Bali, Indonesia

Co-Chair's Summary

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 - b) Address climate-related challenges
 - c) Improve understanding of the land-sea interface, the coastal zones and pressing need to monitor sea level rise;
 - d) Importance in mainstreaming the Blue Economy;
 - e) Achieving sustainable coastal development and resilience.
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- 9) Plans and activities of the Working Group and updating the Workplan
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- 11) Seventh High-level Forum on Global Geospatial Information Management with the theme "Accelerating implementation: Achieving resilience"
- 12) Next steps, summary and close

Summary notes

1) *Welcome and introductions*

A total of 49 representatives participated in the Sixth expert meeting. Forty participants were representatives from eighteen Member States (Australia, Canada, Denmark, Germany, Indonesia, Iran, Italy, Republic of Korea, Malaysia, Morocco, Norway, Saudi Arabia, Singapore, Thailand, Tonga, United Kingdom, United States, Venezuela), 5 from international and regional organizations (IHO, SPC and OGC),

3 observers from Thematic Networks (Esri and Teledyne) and 1 staff member of the United Nations Secretariat.

During the one-day International Seminar on United Nations Global Geospatial Information Management with the theme “effective and integrated marine geospatial information management”, there was an additional 60 participants (approximately), almost all from within Indonesia.

2) *Agenda, organization of the meeting and setting the scene*

Agenda and the organization of the meeting were adopted including joint sessions with the IHO Marine Spatial Data Working Group and the OGC Marine Domain Working Group.

The co-Chair encouraged the Working Group to share experience from their implementation of the UN-IGIF-Hydro and reiterated the need to update and maintain the UN-IGIF-Hydro as a living document. With regards to addressing the integration of terrestrial, maritime, built and cadastral domain, the co-Chair looked forward to the preparation of a guidance document aligned with the nine strategic pathways of the UN-IGIF. The approach is to showcase good practices and lessons learnt, possibly using the Singapore-IHO Innovation and Technology Laboratory as a testbed. It is recognized that more outreach is needed, to engage and include relevant stakeholders.

The co-Chair wished, aligned with strategic pathways 4 – Data and 6 – Standards, to consider marine geospatial data and metadata standards for data interoperability and discoverability. And aligned with strategic pathways 4 – Data and 5 – Standards, to explore marine geospatial technology and innovation including the potential of artificial intelligence to support port operations. Related to strategic pathways 3 – Financial, 8 – Capacity and Education and 9 – Communications and Engagement, the Working Group was encouraged to identify gaps and barriers. The co-Chair recalled that the Committee of Experts at its Thirteenth session reiterated the importance to “leave no one behind” and enquired what does it mean and how to address this issue within the work and activities of the Working Group.

3) *Effective and integrated marine geospatial information management – national and regional perspective*

Through the IHOMSDIWG, fourteen national and regional perspectives were shared and participants interacted, shared additional observations and exchanged views. In particular, the meeting noted the amount of awareness raising and promotion of the UN-IGIF-Hydro within some regional hydrographic commissions of the IHO. In particular, the meeting commended SWPRHC for its efforts to strengthen nationally integrated marine geospatial information management amongst the Pacific Island Countries and Territories through the development of reference resource including videos that are now available online.

4) *Reports, highlights, updates and considerations*

a) Report of the co-Chair on the Working Group’s activities and progress

The co-Chair recalled and reminded the meeting of the five goals for the Working Group and its workplan for 2023 – 2024 –

- Leadership - Provide Leadership in setting the agenda for the development of global geospatial information and to promote its use to address key global challenges

- Coordination - Provide a forum for coordination and dialogue with and among Member States and relevant international organizations on enhanced cooperation
- Capacity development - Provide a platform for the development of effective strategies to build and strengthen national capacity and capability concerning geospatial information, especially in developing countries
- Standards - Propose work- plans, frameworks and guidelines to promote common principles, policies, methods, standards and mechanisms for the interoperability and use of geospatial data and services
- Inclusion - Make joint decisions and set the direction for the production and use of geospatial information within and across national, regional and global policy frameworks

The progress and achievements during the intervening period were discussed and the Working Group looked forward to actionable outcomes from its Sixth expert meeting. The co-Chair shared his observations and summary of the one-day International Seminar.

He observed that the International Seminar with the theme “effective and integrated marine geospatial information management”, the second, saw growing interest and usage of marine geospatial information to address areas beyond the traditional navigational safety. Besides the protection of marine environment, the importance of integrated land and sea data to study the impact of climate and rise in sea levels. One of the positive outcomes experienced in the integration of land and sea data was different agencies coming together to collaborate to share data and develop applications to meet the different needs. In addition, agencies were able to agree on the vertical datum to be adopted to meet specific requirements. Some possible new areas of interests were also identified, for example, the use of underwater sea space by autonomous sub-surface vessels and the designation of marine protected areas under the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ/Treaty of the High Seas).

Recognizing the number and severity of disasters, there is the need to be prepared for crisis. Hence, there is a need to develop capacity and capabilities to meet possible crisis as well as future needs. These could be achieved by adopting technologies and tools such as artificial intelligence and machine learning to perhaps mitigate limited resources. National marine geospatial information entities also need to proactively communicate and publicize their work in order to widen the audience beyond this community. In this regard, the need to develop coordinated outreach programmes and share the knowledge, experience as well as projects that have been and being undertaken.

The importance of collaboration at the national and sub-national levels was re-emphasized, particularly in the context of integrating the terrestrial, maritime and cadastral domains. The signing of a cooperation agreement between Indonesia’s Geospatial Information Agency and Navy’s Hydrographic and Oceanographic Center reinforced this emphasis. The signing of the agreement, in the official opening segment at the International Seminar, was applauded by the participants. The sharing and exchange of data at the national and sub-national levels support the widen application of geospatial information. In this regard, the exchange of data between national agencies, as witnessed at the official opening segment, for the achievement of national development strategies and priorities was also applauded by the participants.

One key statement that was carefully considered during the week came from H.E. Amb. Rena Lee, referring to the BBNJ/Treaty of the High Seas, concluded her keynote presentation with “from **what** to do to **how** to do”. Hence the Working Group and its partners should consider its relevance and contribution in relation to the BBNJ and focus on catalyzing and enabling an environment where practical guidance and methodologies be available to support Member States with the “how to do”.

b) Report of the Secretariat including the programme of work of Committee of Experts

The UN Secretariat provide a report to the Sixth expert meeting informing the Working Group of the outcomes of the Thirteenth session of the Committee of Experts on Global Geospatial Information Management and decisions that impact the functions, activities and tasks of the Working Group. The Working Group was informed of and invited to contribute to the Seventh High-level Forum on United Nations Global Geospatial Information Management with the overarching theme “Accelerating Implementation: Achieving Resilience”. The HLF will be held in Mexico City from 8 – 10 October 2024.

A brief overview of the overarching goals and objectives of the United Nations Global Geodetic Centre of Excellence and the United Nations Global Geospatial Knowledge and Innovation Centre were shared. The Working Group was also informed of the Committee’s work on climate and resilience through a Task Team on Geospatial Information for Climate Resilience and on the future geospatial information ecosystem through a Writing Team on the Future Geospatial Information Ecosystem. The Working Group was reminded to consider the integration of terrestrial, maritime, built and cadastral domains including the technical complexities related to the land-sea interface in collaboration with other functional groups of the Committee. The Working Group noted an urgency in this effort as it relates to the Committee’s effort to address climate related challenges with integrated geospatial (including marine) information. The Working Group was informed of the recent decision by the Bureau of the Committee to include diversity, equity and inclusion (DEI) in its work and activities. The Bureau also required the Working Group to focus on implementation, to develop and provide the needed practical guidance sought by Member States, the “how”, to operationalize globally developed, consulted and agreed geospatial frameworks, norms, principles and guides.

5) *Implementing the UN-IGIF-Hydro at the country-level*

Through the IHOMSDIWG and the presentations related to national and regional perspectives, it was observed that the UN-IGIF is being reference and leverage to strengthen national marine geospatial information management. In some instances, the UN-IGIF-Hydro was also reference. The Working Group noted that the need for greater efforts to raise awareness of UN-IGIF and UN-IGIF-Hydro. and promote its relevance for strengthening national marine geospatial information management or a national hydrographic project. **The Working Group has to consider how to invite, collate and share national experiences in leveraging the UN-IGIF-Hydro towards improved effectiveness and integration of marine geospatial information.**

6) *Relevance of UN-IGIF-Hydro through regular review and updates*

The Working Group acknowledged the importance to maintain and sustain the UN-IGIF-Hydro as a living document. **The Working Group welcomed and accepted the co-Chair’s (MPA Singapore) offer to digitally publish the UN-IGIF-Hydro that will facilitate the maintenance and sustaining the Framework as a living document.** In this regard, it was generally accepted that the maintenance and updating of IHO’s C-17 Publication would need to be coordinated with the UN-IGIF-Hydro.

7) *Availability and accessibility of marine geospatial information (issues identified by Committee of Experts at its Thirteenth Session)*

The Working Group welcomed the issues identified by the Committee of Experts at its Thirteenth session, including: a) Support of national development priorities and accelerating the achievement of the SDGs; b) Address climate-related challenges; c) Improve understanding of the land-sea interface, the coastal zones and pressing need to monitor sea level rise; d) Importance in mainstreaming the Blue Economy; and e) Achieving sustainable coastal development and resilience.

The Working Group continues to encourage national efforts towards improved availability and accessibility of marine geospatial information for a multiplicity of purposes including endeavors to repurpose existing data. It was observed that participants will benefit from improve recognition and investment in their national programme. Equally, participants were encouraged to improve their contributions within the context of their national development priorities.

Notwithstanding, there remains work to do in support of national marine geospatial information authorities to increase their value and visibility with tangible contribution to evidence-based policy development and decision making. In this regard, practical guidance with documented experiences and examples will be helpful to Member States to improve their capacities, and to communicate and engage effectively.

The issue before the Working Group remains, “who” is willing and able to contribute, and to work on documenting experiences and examples, and ‘distill’ appropriate guidance in support of the “how”. This work should be through and inclusive participatory process.

8) *Strengthening collaboration, partnerships, engagement and capacity development*

Finding synergies and leveraging mutual and appropriate capacities and resources, collaborating and partnering, to support the operationalization of the UN-IGIF-Hydro will further strengthen effective and integrated marine geospatial information management at the country-level. This was evidenced from the accomplishments of some Pacific Island Countries and Territories including Fiji, Kiribati and Tonga. This sub-regional effort leverages the knowledge, expertise, indigenous capacities and resources residing within the sub-region itself including in the Pacific Community (SPC). The UN Secretariat informed that their support to the sub-region is with and through the SPC, which included associated capacity and capability development activities. SPC observed that national efforts were greatly enhanced by good stakeholder engagement and collaboration. SPC viewed stakeholder engagement and inclusion to be crucial to effective and integrated marine geospatial information management.

The UN Secretariat commented that such sub-regional modality could be explored for the Caribbean Small Island Developing States (SIDS). It also surmised there could be national entities with capacities and resources to support and contribute to these sub-regional or national initiatives and efforts, perhaps on bilateral basis, further reinforcing the needed partnership for effective and integrated marine geospatial information management.

The Open Geospatial Consortium presentation (Singapore Land Authority and Maritime and Port Authority of Singapore) presented the Federated Marine Spatial Data Infrastructure Pilot carried out in 2023 with three threads, at three locations, Singapore, the Arctic and the Caribbean, involving five

sponsors and ten participants. The pilot was successfully completed and addressed issues related to datum relationships and vertical land motion monitoring. The pilot surfaced challenges including: a) harmonization of land and sea datums; b) low and differing resolution of datasets; c) inherently large dataset sizes; d) inclusion of OGC API open standards for 3D access, storage and visualization.

The Singapore-IHO Innovation and Technology Laboratory presented its effort to support the work on the integration of terrestrial, maritime and cadastral domain and the vertical height datum related to the land-sea interface. **The co-Chair offered to digitally publish the UN-IGIF-Hydro to facilitate the maintenance and sustaining the Framework as a living document.** It was generally accepted that the maintenance and updating of IHO's C-17 Publication would need to be coordinated.

It was noted that the Working Group had met on five occasions jointly with the IHOMSDIWG and the OGCMDWG, further strengthening the partnership between these bodies. The Working Group is also encouraged by efforts of some IHORHC in particular the SWPRHC in raising the awareness of the UN-IGIF/UN-IGIF-Hydro and promoting nationally integrated marine geospatial information management.

9) Plans and activities of the Working Group and updating the Workplan

The Working Group discussed its: a) activity 5 - Submit a joint proposal to the IHO-Singapore Innovation and Technology Laboratory together with Expert Group on Land Administration and Management, the IHOMSDIWG and OGCMDWG exploring the land-sea interface and the integration of terrestrial, maritime and cadastral domains; b) Activity 6 - Produce paper or publication that promotes understanding of the land-sea interface and issues of integration to provide solutions leveraging UN-IGIF and UN-IGIF-Hydro to address societal, environmental and economic challenges, and the many facets of land-sea interface including the integration of physical and human geography; and c) Activity 7 - As part of the UN-IGIF-Hydro, develop understanding (and subsequently provide guidance) to connect any marine spatial data infrastructure to the national spatial data infrastructure, and to ensure the principle of "build once, use many times".

During this recent period, a key activity of the Working Group is related to the integration of terrestrial, maritime, built and cadastral domains. The Working Group was information that this consideration would be through the "lens" of the nine strategic pathways of the UN-IGIF and will seek to address the technical complexities related to addressing the land-sea interface and the vertical reference frame (height datum). The work will seek to learn from: a) Land Information New Zealand Joining Land and Sea Project; b) Geoscience Australia Vertical Motion of Pacific Island Tide Gauges under the Pacific Sea Level and Geodetic Monitoring (PSLGM) Project; c) Baltic Sea Chart Datum 2000 (BSCD2000) (Baltic Sea Hydrographic Commission/Swedish Maritime Administration); and d) NOAA Caribbean initiative. There is also the desire to consider the role and contribution of the: a) Singapore-IHO Innovation and Technology Laboratory; and b) United Nations Global Geodetic Centre of Excellence.

In this regard, the Working Group agreed to a suggested modality, to address the integration of terrestrial, maritime, built and cadastral domains through a series of inter-related "bite-size" focus efforts such as vertical reference; data interoperability and integration; data and metadata standards; good practices and lessons learnt; before beginning the consideration and preparation of a guidance document leveraging the nine strategic pathways of the UN-IGIF. In this regard, **the Working Group acknowledged the leadership of the Expert Group on Land Administration and Management to leverage focus work group** involving this Working Group, the Expert Group on Land Administration and Management and where appropriate, the Working Group on Policy and Legal Frameworks for Geospatial

Information Management, the United Nations Global Geodetic Centre of Excellence the Singapore-IHO Innovation and Technology Laboratory. These focus work group should be inclusive and participatory.

10) Fourteenth session of the Committee of Experts, 7 – 9 August 2023

The meeting was informed that the Fourteenth session of the Committee of Experts will be held in Conference Room 4, UNHQ New York from 7 – 9 August 2024. Summaries of reports for all substantive agenda items are expected in first week of May 2024; and technical reports for all substantive agenda items are expected by the end of June 2024.

The Working Group discussed a side event jointly with the Expert Group on Land Administration and Management and perhaps the Working Group on Policy and Legal Frameworks on the work related to the integration of terrestrial, maritime, built and cadastral domains.

The Working Group was also informed to include Diversity, Equity and Inclusion (DEI) in its work and activities and noted that technical reports that missed deadlines will not be considered by the Committee of Experts at its Fourteenth session. The Working Group took note of the Bureau's decision to focus on implementation, to develop and provide the needed practical guidance sought by Member States, the "how", to allow Member States to operationalize adopted frameworks, norms, principles and guides according to their national circumstances.

11) Seventh High-level Forum on Global Geospatial Information Management with the theme "Accelerating implementation: Achieving resilience"

The Working Group noted the convening of the Seventh High-level Forum on United Nations Global Geospatial Information Management with the theme "Accelerating Implementation: Achieving Resilience" in Mexico City from 8 – 10 October 2024.

12) Next steps, summary and close

A total of 49 representatives participated in the Sixth expert meeting. Forty participants were representatives from eighteen Member States (Australia, Canada, Denmark, Germany, Indonesia, Iran, Italy, Korea, Malaysia, Morocco, Norway, Saudi Arabia, Singapore, Thailand, Tonga, United Kingdom, United States, Venezuela), 5 from international and regional organizations (IHO, SPC and OGC), 3 observers from Thematic Networks (Esri and Teledyne) and 1 staff member of the United Nations Secretariat

At the International Seminar, Amb. Rena Lee, referring to the BBNJ/Treaty of the High Seas, concluded her keynote presentation with "from **what** to do to **how** to do". Hence the Working Group and its partners should consider its relevance and contribution in relation to the BBNJ and focus on catalyzing and enabling an environment where practical guidance and methodologies be available to support Member States with the "how to do".

a) Next steps

Implementing the UN-IGIF-Hydro at the country-level, the Working Group has to consider how to invite, collate and share national experiences that leverage the UN-IGIF-Hydro towards improved effectiveness and integration of marine geospatial information. The issue before the Working

Group remains, “who” is willing and able to contribute, and to work on documenting experiences and examples, and ‘distill’ appropriate practical guidance in support of the “how”. This work should be through and inclusive participatory process. The co-Chair (Singapore) agreed to make a start on this work.

Relevance of UN-IGIF-Hydro through regular review and updates, the Working Group acknowledged the importance to maintain and sustain the UN-IGIF-Hydro as a living document, welcomed and accepted the Singapore’s offer to digitally publish the UN-IGIF-Hydro to facilitate the maintenance and sustaining the Framework as a living document.

Integration of terrestrial, maritime, built and cadastral domains, the Working Group acknowledged the leadership of the Expert Group on Land Administration and Management and together, will leverage focus work group modality involving this Working Group, the Expert Group and where appropriate, the Working Group on Policy and Legal Frameworks for Geospatial Information Management, the United Nations Global Geodetic Centre of Excellence the Singapore-IHO Innovation and Technology Laboratory. These focus work groups should be inclusive and participatory. Initial focus will be on the land-sea interface and the technical complexities related to vertical reference (height datum).

Fourteenth session of the Committee of Experts, the Working Group requested the UN Secretariat for appropriate meeting facility to convene a side event on the integration of terrestrial, maritime, built and cadastral domains jointly with the Expert Group on Land Administration and Management and perhaps the Working Group on Policy and Legal Frameworks and the UN Global Geodetic Centre on Excellence.

b) Next meeting

The Working Group will continue its work and activities primarily through electronic means, and going forward, meet in-person on a biennial basis as long as resources are available.

c) Closing remarks

The chair and vice chair of the IHOMSDIWG together with chair of OGCMDWG expressed their appreciation to all participants for their contributions and for working together. They also expressed their appreciation to the host. The Head of PUSHIDROSAL, after thanking all participants, remarked that marine geospatial information should be available to support not just safety of navigation, but national development priorities. The Deputy Chair of BIG urged for intensified efforts to elevate the value and recognition of integrated geospatial information management. He added that leadership and collaboration will allow our geospatial community to propel ahead.

d) Statement of thanks

The co-Chair on behalf of the Working Group thanked the IHO Marine Spatial Data Infrastructure Working Group and the OGC Marine Domain Working Group for the collaboration and for the joint meetings. The participation and contributions from members of both groups allowed for better coordination and coherence in the respective agendas, focus and work of all three groups.

Participants overwhelmingly thanked the Government of Indonesia, its Geospatial Information Agency and Navy's Hydrographic and Oceanographic Center, for their very warm reception and superb hospitality during this weeklong event. The meticulous attention to detail, well organized activities, and the genuine warmth extended to all participants ensure both a productive and enjoyable week in Bali. In particular, special thanks to the staff of the Geospatial Information Agency, the Navy's Hydrographic and Oceanographic Center, and the Courtyard Bali Nusa Dua Resort for their patience, their dedication and their tireless efforts that fostered many meaningful dialogues and considerations. It was a memorable week.

Parry Oei
Co-Chair, Working Group on Marine Geospatial Information
Bali, Indonesia
8 March 2024

