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Marine geospatial information

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Note by the Secretariat

Summary

The present paper contains the report of the Working Group on Marine Geospatial Information for consideration by the Committee of Experts on Global Geospatial Information Management.

At its ninth session, held in New York from 7 to 9 August 2019, the Committee of Experts adopted decision 9/108, in which it noted the progress made by the Working Group on its use case exercise on data availability and interoperability and invited it to consider the variety of marine data sources that might be available, and in that regard to consider capacity development activities to strengthen marine geospatial information capabilities in developing countries and small island developing States. The Committee noted that the Working Group's terms of reference included the consideration of coastal zones, inland waterways and water bodies and requested it to consider and facilitate integrated ecosystems geospatial data management practices. In this present report, the Working Group provides information on its progress to date, including its second expert meeting, held in Rostock-Warnemünde, Germany, from 24 to 28 February 2020. The Working Group discusses progress in the use case exercise to explore the issues, challenges and benefits of making available, and providing easy access to, marine geospatial information, documenting these issues, and considering solutions from real-world practices and experiences. In that regard, it has prepared a white paper in which it reports on the findings and conclusions of the use case exercise and related case studies provided by members of the Working Group. In the white paper, provided as a background document to the report, the Working Group seeks to demonstrate the benefits of readily available and accessible marine geospatial information conceptually, provide information on the challenges that many countries face in making marine geospatial information more readily available and accessible, and develop some guidance on actions to enhance the availability and accessibility of marine geospatial information in order to ensure its widest and fullest utility.

* E/C.20/2020/20

I. Introduction

1. Approximately seventy percent of the Earth's surface is covered by water - lakes, rivers, tributaries, deltas, coasts, seas, and oceans. Water is critical to socio-economic development, food and energy production, including renewable energy, healthy habitats and ecosystems, and to human survival overall. Water is at the heart of adaptation to climate change and serves as the crucial link between society, the environment and the global economy. More than four billion people depend on maritime waters for fish as a primary source of protein[1], and an estimated ninety percent of the world's trade is conducted upon the seas and oceans[2].

2. At its ninth session, held in New York from 7 to 9 August 2019, the Committee of Experts adopted decision 9/108, in which it noted the progress made by the Working Group on its use case exercise on data availability and interoperability, and invited it to consider the variety of marine data sources that might be available, and in that regard, consider capacity development activities to strengthen marine geospatial information capabilities in developing countries and small island developing States.

3. Increasing the availability and accessibility of marine geospatial information can benefit many sectors within the maritime domain, including: commercial shipping and safe navigation; management of maritime resources, the Blue Economy, and marine spatial planning; emergency management and response; maritime limits and administration; and law enforcement and defence. Access to marine geospatial information can provide the data needed to monitor progress towards national development priorities and the sustainable development goals (SDGs).

4. As global reliance on water and its resources increases, marine geospatial information is needed to support data-driven, evidence-based management and administration of seas, oceans, coastal zones, rivers and tributaries, inland water bodies and waterways. Knowing where people, marine life, events, and activities are, and their relationships to one another, is essential for informed policy and decision-making. The timeliness of such data is of equal importance. Real-time marine geospatial information is needed to prepare for and respond to emergency situations, such as natural disasters.

5. This present report provides information and updates on the Working Group's progress and activities during this reporting period. The Committee of Experts is invited to take note of the report and consider the white paper on readily available and accessible (open) marine geospatial information, provided as a background document to this present report. The white paper discusses the challenges in making marine geospatial information more readily available and accessible, and provides some recommendations in this regard to ensure the widest and fullest utility of marine geospatial information. Points for discussion and decision are provided in paragraph 30.

II. Membership and activities

6. During this reporting period, the Working Group welcomed Algeria, Brazil, Lebanon, Oman, Singapore and Tunisia as members of the Working Group. These additional members increased geographic representation in the Working Group. However, the workings of the Group would benefit further from additional participation from small island developing States and Africa. The Working Group presently comprises expert representatives from 25 Member States, the International Hydrographic Organization (IHO), and four relevant organizations from the United Nations system and the Committee's stakeholder community.

1 Food and Agricultural Organization, 2014

2 International Maritime Organization, 2015

The Working Group is presently co-Chaired by Burkina Faso and the United States of America.

7. At the ninth session of the Committee of Experts, the Working Group convened a side event, on 5 August 2019, to discuss readily available and accessible marine geospatial information with delegates from Member States and relevant observers and stakeholders. The event provided additional inputs and afforded better understanding and identification of trends, strengths, issues, challenges, proven practices and solutions in making marine data available and accessible. The side event was supported by the IHO, the Open Geospatial Consortium (OGC) and the Artic Regional Hydrographic Commission.

8. An open meeting of the Working Group was convened during the ninth session (8 August 2019), and provided another opportunity for the Working Group to engage delegates from Member States and raise awareness of its objectives and activities. The meeting provided valuable feedback and reiterated the Working Group's responsibility to address coastal zones, inland waterways and water bodies, and the need to consider the land-sea interface.

Second expert meeting of the Working Group

9. The Working Group prepared and convened its second expert meeting[3], a physical meeting, held in conjunction with the 11th meeting of the Working Group on Marine Spatial Data Infrastructures of the IHO (MSDIWG-IHO), and the meeting of the Marine Domain Working Group of the OGC (OGC-MDWG). The meeting was capably hosted by the Federal Maritime and Hydrographic Agency (BSH) of Germany, a member of the Working Group, at the Leibniz Institute for Baltic Sea Research Warnemünde (IOW), Rostock-Warnemünde, Germany from 24 to 28 February 2020. The meeting was participated by 23 expert representatives from 18 Member States, one each from the IHO and the United Nations secretariat, and eight expert representatives from relevant organizations from the Committee's stakeholder community[4].

10. The Working Group sought to advance its work on data availability, accessibility and interoperability, and to better understand the challenges, opportunities and feasible solutions in promoting readily available and accessible marine geospatial information for a multiplicity of applications. Within the agenda, the meeting considered the United Nations Integrated Geospatial Information Framework (IGIF) and its implementation guide as a mechanism for articulating and demonstrating national leadership in marine geospatial information. The meeting considered working across the land and sea interface, integrated ecosystems data management practices, and capacity and capability development. The Working Group further reviewed its progress and results of its current work plan and activities, and discussed new and emerging opportunities.

11. A total of nineteen presentations were delivered in support of the agenda and deliberations, and together with open and breakout discussion sessions, contributed to an engaging and substantive five days. The expert meeting concluded with seventeen outcomes, including and related to: i) the Decade of Ocean Science for Sustainable Development (Decade); ii) the Nippon Foundation-GEBCO Seabed 2030 Project (Seabed 2030); iii) capacity development; iv) IHO-OGC marine spatial data infrastructure concept development study; v) use case exercise and the white paper; vi) integrated geospatial information management; vii) proposed IHO innovation and technology laboratory; viii) availability and accessibility of bathymetric data and the IHO Data Centre for Digital Bathymetry; ix) inland waters and water bodies; x) land-sea interface; xi) integrated ecosystems geospatial data management practices; and xii) objectives, activities and the third expert meeting of the Working Group.

3 http://ggim.un.org/meetings/2020/WG-MGI-Rostock/

4 http://ggim.un.org/meetings/2020/WG-MGI-Rostock/documents/List-of-participants_Rostock.pdf

12. The Working Group requested the Director of Seabed 2030 and the Secretary-General of the IHO to represent the marine geospatial information community at the Decade's planning meetings. Additionally, when appropriate, to coordinate and develop initiatives or proposals as part of the Decade's initiatives and program to raise awareness and promote the importance and significance of marine geospatial information. The need to promote and support activities to engage relevant communities beyond the hydrographic/nautical charting community was recognized. Equally, it is also important to raise the benefits and value of comprehensive bathymetric coverage of coastal, seas and ocean floors, and thus support Seabed 2030.

13. Capacity development is important, and the Working Group agreed to leverage the initiatives and program of the IHO and its regional Hydrographic Commissions. In this regard, the Working Group requested the IHO to extend its regional or sub-regional capacity development activities to include United Nations Member States and those with inland waters and waterways as appropriate. The Working Group agreed that it needed better appreciation and understanding of the issues and challenges with regard to the collection, storage, management and sharing of geospatial information as it relates to inland water bodies and waterways. In this regard, the Working Group looked forward to the IHO's use case that considers inland water bodies and waterways.

14. The Working Group affirmed its preparation of a white paper as the outcome report of its use case exercise with observations, findings and recommendations to address the availability and accessibility of marine geospatial information. The recommendations should address gaps, issues and challenges, include appropriate real-world examples and proven practices to support the recommendations. The Working Group sought to complete its white paper and to provide it to the Committee of Experts at its tenth session.

15. The IGIF was considered as a viable basis and a mechanism to facilitate an ecosystem of integrated geospatial data management practices, including addressing issues and challenges pertaining to inland water bodies and waterways, and the land and sea interface. The Working Group considered an integrated geospatial data management approach, including standards, in support of integrated ecosystems-based management practices that would require collaboration across disciplines and institutions, including users and stakeholders. The Working Group welcomed the concept and proposed establishment of the IHO innovation and technology laboratory that could possibly take on joint initiatives related to the land-sea interface and the measuring and monitoring of the SDGs.

16. The role and application of marine geospatial information to support coastal zone management, including the preparation of management plans, were discussed. The obvious need for the integration of onshore and offshore datasets was recognized. The Working Group considered that the IGIF provides the mechanism to facilitate collaboration between the maritime, terrestrial and cadastral domains in this regard.

17. All participants appreciated the conducive meeting facilities, warm reception and hospitality of the host, the Federal Maritime and Hydrographic Agency (BSH). The Working Group further acknowledged the benefits of joint meetings with the MSDIWG-IHO and OGC-MDWG, and invited expressions of interest to host its third expert meeting that could include a learning event such as an international seminar on United Nations global geospatial information management. Subsequently, at its sixth virtual meeting, the Working Group was informed that there was only one expression of interest; from the Maritime and Port Authority of Singapore. Therefore, the third expert meeting of the Working Group, to be hosted by the Maritime and Port Authority of Singapore, will be convened in 2021 when the global situation permits.

Virtual meetings of the Working Group

18. The Working Group convened two virtual meetings during this reporting period to progress its work and activities. The Working Group had its fifth virtual meeting on 25 September 2019 and its sixth on 3 June 2020. At its fifth virtual meeting, the Working Group reviewed the views and guidance from the Committee of Experts at its ninth session, and outcomes of its side event and open meeting. The Working Group was encouraged by the level of engagement, the number of interventions and the guidance provided. The Working Group discussed the advantages of broader geographic representation including from Africa and the small island developing States. It was agreed that the communication and engagement plan of the Working Group should be reviewed and revised in this regard.

19. The sixth virtual meeting of the Working Group reviewed the outcomes from its second expert meeting and the follow-through action items, and noted that almost all of the follow-through items have since been actioned. The Working Group reviewed the draft final version of the white paper and provided additional feedback and comments to further improve the draft. The Working Group thanked many of its members for their contribution to the development and preparation of the white paper and agreed to provide it to the Committee at its tenth session as a background document to the report of the Working Group.

20. In reviewing its work plan and upcoming activities, the Working Group considered the context of emergency response, including the accessibility of data, the contribution of the Seabed 2030 in this regard, interoperability and standardized datasets, and shallow water bathymetric data in responding to disasters. There were considerations for data integration including administrative areas and statistics, issues of terms of use in the context of data sharing, and whether there are common release statements; considerations for why, e.g., depths of inland waterways are not made available, and other 'ready-to-use' inland water products that could otherwise be made available. The Working Group agreed to leverage the IGIF and its implementation guide and reminded itself not to embark on a parallel process nor duplicate efforts, but rather to capitalize on the work done, especially in the area of implementation guidance.

III. White paper on readily available and accessible (open) marine geospatial information

21. The white paper on readily available and accessible (open) marine geospatial information is provided as a background paper to this present report. The purpose of the white paper is to document the results of the Working Group's use case exercise and is intended to serve as a reference to improve the availability and accessibility of marine geospatial information for the benefit of society, environment, and economy. It addressed the benefits and challenges of managing and providing accessible marine geospatial information. Within the white paper, 'marine' refers to both the traditional maritime domain – seas, oceans, and their ports and harbors, and to the remaining seventy percent of Earth's surface covered by water – coastal zones, deltas, inland waterways and water bodies.

22. Given the need for access to marine geospatial information, the Working Group had recognized that providing guidance on managing and providing access to marine geospatial information might encourage countries to make standard-based and fit-for-purpose marine geospatial information available. While the benefits and challenges of providing easy access to marine geospatial information are conceptually well-understood, the Working Group was responding to the need to document these issues and their solutions in real-world situations. The use case exercise was undertaken to understand how countries manage and make marine geospatial information accessible.

23. The white paper discussed the benefits with five categorizations: i) commercial shipping and safe navigation; ii) management of marine resources, the Blue Economy, and marine spatial planning; iii) emergency management and response; iv) maritime limits and administration of maritime spaces; and v) law enforcement and defense. The discussion served as a reference on the variety of ways access to marine geospatial data can benefit countries, agencies, and other stakeholders.

24. The white paper noted the significant strides achieved in collecting, aggregating, and making marine geospatial data available. However, many initiatives still struggle to unlock the full societal, environmental, and economic potential from the wealth within marine geospatial information. The need for better integrated and sustained access to marine geospatial information remains high. The ability to effectively share, use, and re-use marine geospatial information across and between diverse groups of stakeholders is dependent upon access to and awareness of marine geospatial data and its sources. Some primary challenges faced when managing, providing, and utilizing marine geospatial data include:

(a) Marine geospatial data collection and management are funded for a purpose, e.g. for safety of navigation, with tightly defined responsibilities for the designated agency;

(b) Most of the existing legislations governing geospatial data were developed with other geospatial applications in mind, e.g., cadastre, safe navigation, and/or maritime boundaries;

(c) The integration of geospatial data from the terrestrial and maritime domains, including data from inland waterways and water bodies;

(d) The balance between concerns over national security with data-sharing when managing, providing, and utilizing marine geospatial data; and

(e) The lack of resources and capacity to collect and to share marine geospatial data.

25. The white paper discussed five case studies that demonstrated different ways to address marine geospatial information management. These case studies revealed proven practices that can overcome challenges to managing, utilizing, and providing access to marine geospatial information, and emphasized the benefits to be gained when data are shared and available. The case studies are: i) Australia's Pacific Community Islands and Territories Tidal Observation Project; ii) New Zealand's Joining Land and Sea Project (JLAS) and the New Zealand Marine Geospatial Working Group (NZMGI-WG); iii) Norway's MSDI and Marine Spatial Planning; iv) Arctic Spatial Data Infrastructure; and v) Nippon Foundation-GEBCO Seabed 2030 Project.

26. The main recommendations of the white paper are to:

(a) Develop data-sharing partnerships to facilitate the timely sharing of data between Member States, government agencies, research and academia, private data-providers, and other users and stakeholders;

(b) Implement internationally agreed-upon standards, including standards for metadata, to make data-sharing easier and more discoverable (e.g., ISO, IHO, and OGC suite of standards);

(c) Collect and manage marine geospatial data with multi-use purposes in mind, and increase stakeholder awareness of what information is available and where; and

(d) Contribute to capacity development opportunities when resources allow, and actively transfer knowledge, tools, and techniques that facilitate the collection, management, and sharing of marine geospatial data in developing counterparts.

IV. Summary

27. A significant challenge moving forward is the integration of terrestrial and maritime geospatial data. This integration is a priority for many Member States. Policy-willingness and people-readiness are vital to ensure that institutions collaborate and together consider, develop, and build interoperable frameworks, standards, and infrastructures for the integration of all types of geospatial information. A helpful next step is the development of an integrated policy and operational framework leveraging the IGIF to facilitate rapid acceptance, qualification, ingestion, and use of relevant marine geospatial information from a range of providers (e.g., government, commercial providers, and users), and deliver marine geospatial information for the land-sea interface, integrated ecosystems management practices, and a multiplicity of applications.

28. The Working Group, at its sixth virtual meeting, discussed initial and background work that would result in a reference document to begin the consideration on how to implement the IGIF for the seventy percent of Earth's surface covered by water. The Working Group's white paper on readily available and accessible (open) marine geospatial information provided additional context and considerations for this task. At its second expert meeting, the Working Group had tasked a team, comprising expert representatives from Canada, Denmark, Jamaica, Norway, Singapore, and led by the United States of America, to develop an initial draft of a reference document for effective and integrated marine geospatial information management.

COVID-19 global pandemic

29. COVID-19, in many ways, a virus that is all about location with spatial-temporal aspects, its outbreak impacts, for example, residents and communities, healthcare and basic services, businesses and activities, and the accompanying societal and economic effects, are categorized using location. Contributing to the availability and accessibility of comprehensive location-based information, including marine geospatial information, benefits many governments, users and stakeholders. The COVID-19 global pandemic highlighted the need for the geospatial community to be prepared to support any national response in a timely manner to the public health crisis and impacts with its geospatial data, technologies and processes. Readily available and accessible marine geospatial information will support data sharing and data integration needed for public health and safety measures and responses.

V. Points for discussion

30. **The Committee of Experts is invited to:**

(a) Take note of the present report, express its views and provide guidance to the Working Group on its progress, activities and next steps;

(b) Take note and express its view on the white paper on readily available and accessible (open) marine geospatial information, provided as a background document to this present report; and

(c) Take note of, express its views, and provide guidance on efforts to leverage the Integrated Geospatial Information Framework to develop and prepare a reference document for effective and integrated marine geospatial information management.