
**Report to the 48th General Assembly
FIG Working Week 2025, Brisbane, Australia**

FIG Commission 4 (Hydrography)

Report of Activities 2024-2025

1. General

FIG Commission 4 is dedicated to advancing the science, practice, and development of hydrographic surveying and related hydrospatial disciplines. It serves as a dynamic platform for surveyors, researchers, and professionals to collaborate, drive innovation, and address global challenges within the hydrospatial domain. For the 2023–2026 term, the commission operates through five (5) active Working Groups. Over the past year, Commission 4 has demonstrated significant progress, with a strong emphasis on fostering collaboration across the global surveying community.

2. Working Groups

2.1 WG 4.1 - Hydrographic Standards and Guidelines.

In 2024, WG4.1 continued its advocacy for open standards intended for use by surveyors, and also undertook outreach and consultation activities regarding the preparation of useful guidelines for surveyors seeking to undertake efficient data processing of point cloud bathymetric datasets.

WG4.1 monitored and submitted comments in support of Open Geospatial Consortium (OGC) adoption of Bathymetry Attributed Grid (BAG) as a community standard. The OGC technical committee has now voted to establish a work item to assess BAG for adoption. This represents an opportunity for a hydrographic and hydrospatial industry focused data interchange format to become a broadly implemented open standard and as a result, WG4.1 continues to observe with interest.

2.2 WG 4.2– Sustainable Oceans and Hydrography.

The WG 4.2 of FIG Commission 4 focuses on promoting awareness and fostering engagement with international governmental and non-governmental organizations to enhance the understanding of the critical importance of marine and ocean areas. This initiative aims to emphasize the role of hydrography in Hydrospatial domain supporting sustainable development, environmental stewardship, and effective marine spatial planning. By adopting a holistic approach, WG 4.2 seeks to ensure that hydrographic projects contribute to the long-term resilience and sustainability in the Hydrospatial domain.

Additionally, WG 4.2 chair (Gordon Johnston) actively represents FIG at the International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) sessions, reinforcing its commitment to global standards and capacity building. The group is also at the forefront of innovation,

working to develop a methodology for quantifying the carbon footprint of hydrographic data acquisition and related activities. This pioneering effort aims to align hydrographic practices with global climate goals, promoting environmentally responsible operations within the hydrographic community.

2.3 WG 4.3– Mapping the Plastic.

Working Group 4.3 is a joint Commission 4 and Young Surveyors Network initiative and is FIG's response to the global plastic waste crisis in the Hydrospatial domain. We have developed a world-leading spatial information tool to accurately map and classify water borne and land based plastic waste. Deep learning algorithms distinguish and classify plastic waste from surrounding litter/debris classes from UAV orthophotos and multi-spectral images enabling identification of plastic debris as small as 1 cm² in area. Last year, two field studies were carried out in Sri Lanka and Ghana as part of the Global Plastic Mapping Campaign. The WG 4.3 focus is currently on Ghana, where the problem and solution converge. Ghana has a significant plastic waste problem, and the 2023 Accra Working Week presented an opportunity to introduce our solution to academics and regulators looking at ways to deal with the problem.

WG 4.3 has submitted a proposal to Ghanaian Ministry for the Environment, Science, Technology and Innovation to assist with their 'plastic not seen' project and is awaiting confirmation. Funding previously secured by a grant from the FIG Foundation to undertake plastic survey trials with the Commonwealth Scientific and Industrial Research Organization of Australia (CSIRO) Marine Debris Team will instead be used for the work in Ghana.

Students from the Sabaragamuwa University of Sri Lanka undertook plastic waste surveys at sites near Colombo (Kelani River mouth) and the preliminary results were presented at the Accra Working Week. However due to pressure of work full processing of the data is only underway now and will be completed at the end of the month (January 2025).

2.4 WG 4.4– Hydrospatial Domain and Marine Administration.

The WG 4.4 continued to play a major role in promoting hydrospatial and marine administration initiatives globally. Through collaboration, innovation, and advocacy efforts in various international conferences, workshops, and forums, fostering dialogue and collaboration among industry experts, researchers, and policymakers. Key highlights included capacity-building initiatives, publications on emerging trends, and advocacy for sustainable marine development, positioning hydrography at the forefront of addressing global challenges in marine environments. Additionally, this Working Group is highly active on LinkedIn, enhancing its presence and visibility through the FIG Commission 4 LinkedIn group. Numerous posts and shares related to FIG Commission 4 have been made to promote information, knowledge, activities, conferences, and training in the fields of Hydrography, Hydrospatial, and Marine Administration.

The Working Group 4.4 is steadfast in its commitment to advancing excellence in hydrospatial data management and marine administration. The accomplishments and initiatives detailed in this report reflect the dedication, expertise, and collaborative spirit of the working group members. Looking ahead, we are optimistic about our capacity to effect positive change and to contribute significantly to the sustainable management and conservation of marine resources for future generations. The WGs strategic focus includes

enhancing capacity-building efforts, fostering international collaborations, and promoting the integration of innovative technologies in hydrospatial practices. By continuing to engage with stakeholders across various sectors, we aim to ensure that hydrography plays a key role in addressing the challenges facing our marine environments.

2.5 WG 4.5– Climate Change Induced Sea Level Rise and Adaptation.

The focus for WG 4.5 at the start of 2024 was to build its membership. This was completed and the team has then reviewed the initial WG 4.5 work plan and focus which led to the WG 4.5 title being revised from “Climate Change induced Sea Level Rise and Adaptation” to “Towards integrated measurement of sea level rise and vertical land motion for reliable prediction and adaptation in coastal regions”. The revised WG 4.5 title has been accompanied by a revised work plan which better reflects the WG 4.5 members’ expertise and time commitments, leading to a more specific (and achievable) set of core objectives. Hence, WG 4.5 will focus on an integrated approach using geodetic applications that can identify coastal areas of accelerating relative sea level rise where local sea level rise is compounded by land subsidence in coastal regions.

A key objective is to support and facilitate multidisciplinary collaboration between surveying, geospatial & hydrospatial sciences by establishing links and collaboration with existing sea level research groups. We have reached out to a number of groups related to WG 4.5 objectives and discussed ways that our groups could collaborate without duplicating our core activities. These discussions are ongoing and will be developed further in 2025.

3. Cooperation

Commission 4 represents FIG in the International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) and working closely with the other sister organizations such as International Hydrographic Organization (IHO) and International Cartographic Association (ICA).

WG4.1 advanced two new agenda items with the Open Navigation Surface Working Group (ONSWG) throughout the year, raising awareness of limitations in key industry software vendors' implementation of optional layers in BAG format, and seeking support for the return of cryptographic signing in the BAG roadmap due to its important role in protecting the liability of the surveyor, and provenance of survey datasets. The submissions received positive support from the ONSWG and BAG user community, with subsequent agreement on adoption of the IHO S-100 cryptographic signing approach within the BAG format specification.

Simon Ironside (Chair, WG4.3) met representatives of the Ghana Lands Commission, gave a presentation to students and staff at the University of Environment and Sustainable Development and met the Minister for the Environment, Science, Technology and Innovation (MESTI) and MESTI Directors to discuss how their solution could be utilised.

4. Events

Commission 4 actively represented FIG at various global events over the past year. A key highlight was the FIG Working Week 2024 in Ghana, where the commission hosted two technical sessions and a special session on Plastic Mapping, which included an engaging panel discussion. By participating in workshops, webinars, and international conferences, the commission has successfully fostered dialogue and facilitated knowledge exchange on emerging challenges in hydrographic practices and their implications for the hydrospatial domain.

Geoff Lawes (Chair, WG4.1) attended the Australian Government Hydroscheme Industry Participation Program annual supplier meeting, presenting on redundant data processing considerations to the Australian and NZ participants in the program. The presentation received significant interest with a number of participants offering contributions and considerations to assist in concept development for broader circulation during FIG Working Week 2025.

The Mapping the Plastic session during the working week 2024 were well attended and all the delegates, particularly the African delegates were dismayed about the amount of plastic waste in their countries and looking for solutions. A plastic survey was also undertaken at Korle Gono beach in Accra during the working week using a Lands Commission UAV to demonstrate the data capture process.

At the Geospatial World Forum 2024, which took place from 13-16 May 2024 in Rotterdam, The Netherlands, Denis Hains (co-chair, WG 4.4) participated as the moderator for Session 1: Blue Economy - Unlocking Ocean of Opportunities for a Prosperous and Sustainable Future. This session concentrated on the sustainable utilization of ocean resources to realize substantial economic potential. It underscored the role of the blue economy in driving innovation, creating jobs across various sectors, including renewable energy, fisheries, and tourism, while promoting balanced development that benefits both communities and the environment. Additionally, the forum provided an opportunity for WG 4.4 to showcase its initiatives, share insights with industry peers, and establish collaborative networks with other organizations. On day 2 and 3 of this Forum, the first Hydrospatial Summit was held regrouping many important organizations and companies including the IHO and Seabed 2030.

During the Canadian Hydrographic Conference 2024, held from 27-30 May 2024 in St. John's, Canada, Denis Hains co-presented an article entitled "International Recognition as a Certified Hydrographic Surveyor". The discussion likely explored established frameworks, best practices, and pathways for achieving international recognition, extending its relevance to hydrography and related fields such as marine cartography and hydrospatial sciences. Further, Denis has been a member of the IFHS-HPAS Panel to assess submissions provided by candidates willing to obtain a professional certification Level 2, Level 1 and Level 0. This Scheme is one of the 4 recognized by the International Hydrographic Organization (IHO) / International Federation of Surveyors (FIG) / International Cartographic Association (ICA). The WG 4.4 is supporting and promoting equally this four global recognized organizations (Australasia, Canada, Europe and USA).

5. Communication and publications

Mapping the plastic – Helping communities address the global plastic waste crisis. The International Hydrographic Review, <https://ihr.iho.int/articles/mapping-the-plastic-helping-communities-address-the-global-plastic-waste-crisis/>

Mapping the Plastic, GIM International, [Mapping the plastic using UAV imagery | GIM International](#)

FIG Commission 4 Work Plan 2023–2026: Targeting the next challenges in the hydrospatial domain, The International Hydrographic Review, <https://ihr.iho.int/articles/fig-commission-4-work-plan-20232026-targeting-the-next-challenges-in-thehydrospatial-domain/>

International recognition as a Certified Hydrographic Surveyor, Hydro International, <https://www.hydro-international.com/content/article/international-recognition-as-a-certified-hydrographic-surveyor>

6. Other highlights

Commission 4 has been closely working with the FIG YSN and CCTF over the years and supported several events and activities during the year 2024. Commission 4 has contributed to the FIG Climate Compass Task Force Webinar 2024: Geospatial & Land Information System Innovations for Climate Action. These sessions served as a platform to emphasize the critical role of surveyors in addressing the challenges posed by climate change, with a particular focus on the coastal zone in the hydrospatial domain.

Through insightful presentations and discussions, Commission 4 highlighted how hydrography and geospatial + hydrospatial technologies can support climate action by enabling more informed decision making in coastal management and disaster resilience. Topics addressed included the monitoring of sea level rise, coastal erosion, and habitat changes, as well as the use of hydrographic data to design sustainable solutions for protecting vulnerable coastal communities in the hydrospatial domain.

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Chair- FIG Commission 4
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