United Nations Global Geodetic Centre of Excellence
4th UN-GGCE Advisory Committee
UN GGCE, Bonn, Germany, 9 – 10 March

Contribution to the IHO Work Programme 2026	
Task 11.12.2	Maintain relationship with United Nations (UN) organizations based in New York, including the UN Division on Ocean Affairs and Law of the Sea (UN-DOALOS)

High level summary:

- The need for IHO expertise on chart and tidal datums was noted as critical for completing a study on land-sea integration to align chart and datum standards with the guidance paper's recommendations.

- The fragility of the global geodetic supply chain — characterised by an ageing volunteer workforce, underfunded infrastructure, and the absence of sustainable governance — was noted as a direct risk to the integrity of IHO products and services, given that ENC accuracy, datum reliability, and the positioning foundation underpinning all nautical charting depend on a geodetic infrastructure that currently lacks the resilience to guarantee continuity.

- The divergence between WGS84-referenced IHO S-100 product specifications and the terrestrial migration toward ITRF-based references was noted, with a coordinated roadmap for convergence identified as a priority for future S-100 product specifications and the ECDIS performance standard.

- The IHO's membership and governance structure — in which 104 member states convene around share standards and conventions — was presented as a potential model for how a future international geodetic authority could be structured, offering a precedent for building broad multilateral participation around a technically-driven framework.

Details:

The United Nations Global Geodetic Center of Excellence, 4th UN-GGCE Advisory Committee meeting was held in Bonn, Germany from 9 – 10 March. Dr. John Nyberg represented the IHO at the meeting.

The mandate for the UN-GGCE's work originates in a 2015 UN General Assembly resolution calling for a global geodetic reference frame for sustainable development. The overarching vision is that all countries have strong support for geodesy in order to accelerate the Sustainable Development Goals and deliver social, economic, and environmental benefits. The resolution identified five priority areas: better advocacy to governments and the private sector; increased awareness among user communities including satellite services and Earth observation; increased capacity; and stronger international governance.

The UN-GGCE's 2025 work focused on building the evidence base and capacity for global geodesy. A listening tour engaged over 500 participants from 110 countries, leading to a Global Geodesy Needs Assessment and the first Joint Development Plan for Global Geodesy. Four in-person capacity workshops were held across Europe, Africa, Asia Pacific, and the Americas, reaching 216 participants from 100 countries and combining technical training on time-dependent reference frames, GNSS, and trans-

formations with communications skills to support national implementation. A Multilateral Memorandum of Understanding (MMOU) initiative was launched in mid-2024 to formalize long-term institutional commitments, and a University of Melbourne PhD initiative attracted over ten applicants to research the integration of dynamic land deformation into cadastral models.

A Global Geodesy Supply Chain Maturity Assessment, drawing on consultations with over 130 professionals, returned an overall average maturity score of 2.3 out of 5 — placing the supply chain between basic and standardized operational levels. Data management was the strongest domain at 2.7, while governance and finance scored lowest at 1.8, often found to be absent or operating in ad hoc form. Technical and operational capabilities have developed reasonably well through decades of scientific collaboration, but overarching governance, strategic planning, risk management, and financial controls remain largely undeveloped, leaving the system increasingly vulnerable.

The path forward requires a significant shift in how geodesy is framed and funded — moving from a science-driven model toward treating it as critical infrastructure. Recommended actions include producing concise, audience-tailored policy briefs that translate maturity findings into economic and operational risk terms for policymakers, space agencies, and the private sector. Key supply chain vulnerabilities — including an ageing volunteer workforce, underfunded infrastructure, and the absence of a clear funding model — need to be quantified and communicated in terms that resonate beyond the scientific community. Spectrum protection and network resilience, including alternatives to GNSS, are flagged as urgent priorities.

The absence of any single international authority with enforcement powers is one of the most critical structural weaknesses in global geodesy. The existing framework relies on voluntary contributions and non-binding UN General Assembly resolutions, which have proven insufficient to mandate resource contributions or ensure operational continuity. This points toward the need for a new international governance mechanism — one that goes beyond the coordinating role of the IAG and the advisory function of the UN-GGCE. Such an organization would need a treaty-based foundation to give it genuine authority with a mandate covering funding obligations, infrastructure resilience, spectrum protection, and workforce development.

A zero-draft governance model proposes a global coordination body with regional implementation, with operational targets of roughly 25 VLBI, 25 SLR, and 25 high-quality GNSS core stations per region, co-located to reduce biases and ensure redundancy. The estimated annual cost is $70–145 million against current spending of $70–100 million, leaving a funding gap of $40–70 million per year, to be addressed through regional pooled funding, a Global Geodesy Fund, and public-private partnerships.

Separately, a position paper was presented outlining three governance options — a new legally binding treaty, expansion of an existing intergovernmental agreement (e.g., WMO or ITU), or a non-binding framework with voluntary targets — warning that inaction risks supply chain degradation worth hundreds of billions of dollars annually. Formal circulation to heads of delegation is planned for May, with multilingual webinars in June and a potential director-general meeting alongside the UNGGIM 16th session in August.

Work is underway to develop a practical guidance paper unifying fragmented land and sea vertical datasets around a common reference surface (geoid/quasi-geoid or ellipsoid), with the intertidal zone identified as the primary integration challenge due to mismatched data densities, tidal datums, and terminology across ISO, OGC, and IHO standards. On the marine side, current IHO S-100 products and the ECDIS performance standards use WGS84 while terrestrial systems are migrating to ITRF-based references, requiring harmonization and international coordination.

In parallel, a catalogue of 59 geodetic products and 21 Essential Geodetic Variables (EGVs) has been developed to raise the visibility of geodesy's role in the geospatial economy, with next steps focused on identifying long-term stewards, defining product requirements in three phases, and producing accessible policy briefs for non-specialist audiences.

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