UNITED NATIONS E/C.20/2025/9/Add.1

Economic and Social Council

08 July 2025

Committee of Experts on Global Geospatial Information Management
Fifteenth session
New York, 6 – 8 August 2025
Item 8 of the provisional agenda*
Global geodetic reference frame

Global geodetic reference frame

Note by the Secretariat

Summary

The present paper contains the report prepared by the Subcommittee on Geodesy for consideration by the Committee of Experts on Global Geospatial Information Management.

At its fourteenth session, held from 7 to 9 August 2024, the Committee of Experts adopted decision 14/106, in which it welcomed the reports of the Subcommittee on Geodesy and the United Nations Global Geodetic Centre of Excellence and their progress and activities, including their considerable and coordinated efforts to continue to implement General Assembly resolution 69/266. The Committee of Experts expressed appreciation for the work of the Centre and the Subcommittee to strengthen evidence, awareness and understanding of the importance of the global geodesy supply chain as a vital foundation for critical national infrastructure and global economy, and encouraged the Subcommittee and the Centre to continue to provide materials that could be used by Member States to influence decision makers.

The Committee of Experts requested the Subcommittee on Geodesy, with the support of the United Nations Global Geodetic Centre of Excellence, to provide guidance on how to raise awareness and strengthen governance arrangements through the establishment of country-level geodesy working groups, with representatives of Member State defence, policy and science agencies, and partners, to ensure that the risks associated with degradation of the global geodesy supply chain were managed appropriately.

At its fourteenth session, the Committee of Experts also requested the Subcommittee on Geodesy, with the support of the United Nations Global Geodetic Centre of Excellence, to coordinate implementation of the joint development plan to maximize the collective impact of the activities of Member States and partners, with a particular focus on capacity development, and for the plan to address the issue of the reliability and cybersecurity of the software that enabled operational geodesy. The Committee of Experts further requested the Subcommittee, with the support of the Centre, to investigate opportunities to bring the status of and the need for a more sustainable geodesy supply chain to the attention of the greater United Nations community.

* E/C.20/2025/1.

Lastly, the Committee of Experts requested the Subcommittee on Geodesy, with the support of the United Nations Global Geodetic Centre of Excellence, to provide guidance on integrating geodesy for the cadastral, maritime and terrestrial domains into existing frameworks, such as the Framework for Effective Land Administration, in coordination with the International Hydrographic Organization and geodetic and maritime organizations.

In the report, the Subcommittee on Geodesy provides information on its activities during the intersessional period and on the outcomes of its fifth plenary meeting, hosted by the United Nations Global Geodetic Centre of Excellence at the United Nations campus in Bonn, Germany, in March 2025. The fifth plenary meeting was attended by Member State representatives of all United Nations Initiative on Global Geospatial Information Management regional committees and participants from international and regional organizations and geodetic research institutions and relevant stakeholders. At the meeting, the activities of the Subcommittee and the Centre were highlighted, in particular the first joint development plan for global geodesy, the multilateral memorandum of understanding, and work towards bilaterial and regional memorandums of agreement.

The Subcommittee on Geodesy collaborated with the United Nations Global Geodetic Centre of Excellence to organize regional meetings, prepare regional capacity-development workshops, translate documents, actively encourage the participation of Member States and engage in efforts focused on development of the global geodetic reference frame. Furthermore, the Subcommittee provided advice and support to integrate geodesy into the cadastral, maritime and terrestrial domains through phase 5 (2024) of the Federated Marine Spatial Data Infrastructure initiative of the Open Geospatial Consortium and involvement in the workshop on joining land and sea organized by the Centre in Bogor, Indonesia. In addition, the roles of the Centre and the Subcommittee in working towards improved governance of the global geodesy supply chain were addressed and are summarized in the report.

I. Introduction

1. Positioning, navigation, timing and geospatial data are part of everyday life. In addition to the traditional survey, mapping and navigation fields, location-based positioning applications are increasingly critical for civil engineering, industrial automation, agriculture, construction, mining, recreation, financial transactions, intelligent transport systems, disaster response and emergency management, environmental studies and scientific research.

2. The Global Geodetic Reference Frame (GGRF) enables accurate and robust alignment of spatial datasets – a key requirement for sustainable development in fields such as land use planning and administration, construction and hazard assessment. The GGRF is also an essential foundation for national height systems, which enable sustainable water management and monitoring of climate change and its impacts, such as sea-level rise, droughts, glacial retreat and ice-sheet melting.

3. The GGRF is fundamental to supporting the collection, integration and utilization of all other geospatial data. It is relied upon for social, environmental and economic initiatives, Earth science, the measuring and monitoring of progress of the 2030 Agenda for Sustainable Development, the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, the Antigua and Barbuda Agenda for SIDS (ABAS), and other global, regional and national development agenda and initiatives.

4. Recognizing the growing demand for an accurate and stable GGRF and the importance of international cooperation, the UN General Assembly adopted Resolution 69/266 in February 2015, entitled ‘A Global Geodetic Reference Frame for Sustainable Development’. The resolution reflects that the GGRF is the foundation required for the collection, integration, and utilisation of all geospatial information. Furthermore, it supports precise positioning from Global Navigation Satellite Systems (GNSS), which is becoming an important tool for informed decision making, supporting the three pillars of sustainable development – the economy, society, and environment.

5. At its fourteenth session, held in person on 7-9 August 2024, the Committee of Experts adopted decision 14/106, in which it welcomed the reports of the Subcommittee on Geodesy and the United Nations Global Geodetic Centre of Excellence and their progress and activities, including their considerable and coordinated efforts to continue to implement General Assembly resolution 69/266 of 26 February 2015.

6. In this report, the Subcommittee provides information on its activities in the intersessional period, including its efforts to continue to implement General Assembly resolution 69/266 by strengthening the global geodesy supply chain. The global geodesy supply chain, which underpins the Global Geodetic Reference Frame, includes:

(a) ground station observatories owned and operated by mapping agencies, space agencies, universities and research groups, who constantly observe the movement of the Earth and satellites;
(b) data centres operated by specialists who quality check, store, and archive the data from observatories and make it available to the global geodesy analysis community; and,
(c) analysis, combination and correlation centres and analysts who translate the raw data into geodetic products.

7. It is a global geodesy supply chain because no single country can fulfil all the requirements of accurately and reliably observing and analyzing the Earth and satellites. To measure the continuous changes, with the timeliness and level of precision required to produce the geodetic products, satellites and users' demand,

ground observatories and highly qualified people within governments and universities all around the world are needed.

8. As part of its joint communication strategy, the Subcommittee on Geodesy of the Committee of Experts and UN-GGCE are increasingly using the term global geodesy supply chain rather than Global Geodetic Reference Frame. This is primarily because the term global geodesy supply chain is better defined and emphasizes the practical process and collaboration behind geodetic data, rather than abstract technical or ambiguous terms like the “reference frame”. Importantly, the UN-GGIM Subcommittee on Geodesy and UN-GGCE trust that the term global geodesy supply chain highlights the human and operational elements, making it clearer who is involved and what needs support.

9. In this report, the Subcommittee provides information on the outcomes from the fifth plenary meeting of the Subcommittee on Geodesy hosted by the United Nations Global Geodetic Centre of Excellence at the United Nations campus in Bonn, Germany, from 12 to 14 March 2025.

10. The Committee of Experts is invited to take note of the report and to express its views on the activities and next steps of the Subcommittee and the way forward. Points for discussion and decision are provided in paragraph 43.

II. Tenth Anniversary of the UN-GGRF Resolution

11. This year (2025) marks the tenth anniversary of the United Nations General Assembly Resolution A/RES/69/266 titled “A global geodetic reference frame for sustainable development”. Through its six operative paragraphs, the resolution aims to strengthen the cooperation to improve and sustain the global geodesy supply chain. In these ten years, the most significant milestone in realising the ambitions of the resolution was the establishment of the United Nations Global Geodetic Centre of Excellence (UN-GGCE), through the support of Germany in 2023, with the mission to actively contribute to realizing the ambitions of the UN General Assembly resolution. As a result, the work to implement the resolution across all six operative paragraphs has intensified over the last two years.

12. Operative paragraph 1 requested the “Working Group on GGRF” to develop a road map that addressed key elements relating to the development and sustainability of a global geodesy supply chain. This road map was endorsed by the Committee of Experts in 2016, followed by an implementation plan endorsed by the Committee in 2018.

13. Operative paragraph 2 encourages Member States to enhance global cooperation in providing technical assistance, especially in developing countries. There have been continuous activities in this area from before the implementation of the resolution, both by the UN-GGIM regional committees and international organizations like the International Association of Geodesy (IAG) and the International Federation of Surveyors (FIG). Since the opening of the UN-GGCE the activity has increased. With the assistance of geodetic experts, the Subcommittee, FIG and IAG, the UN-GGCE has initiated and arranged a series of workshops targeted towards capacity development in all five regions of the Committee.

14. Operative paragraph 3 urges Member States to implement open sharing of geodetic data in order to create more accurate and reliable geodetic products such as reference frames and Earth Orientation Parameters required for satellite operations. While data-sharing can be sensitive depending on the nature of the geodetic data involved, it remains essential for Member States to strengthen their efforts and establish effective mechanisms—working in cooperation with the UN-GGCE and the IAG—to support the enhancement and densification of the global geodesy supply chain.

15. Operative paragraphs 4 and 5 invite Member States to engage in multilateral cooperation and commit to maintain and improve geodetic infrastructure. The geodetic infrastructure refers to Very Long Baseline Interferometry (VLBI), Satellite Laser Ranging (SLR), Global Navigation Satellite Systems (GNSS), Doppler Orbitography and Radiopositioning Integrated by Satellite (DORIS) and gravimetric instrumentation. The geodetic infrastructure also includes the systems and human resources required to undertake geodetic observations, analysis and the provision of geodetic products and services (E/C.20/2016/4/Add.1). To strengthen commitment at the international level, the Working Group on GGRF was elevated to a Subcommittee on Geodesy in 2017. Following this important step, the Subcommittee led efforts to establish the UN-GGCE at the UN Campus in Bonn, Germany. The Centre, with the support of the Subcommittee, is significantly contributing to increased multilateral cooperation and commitment.

16. The UN-GGCE is working with Member States to strengthen cooperation and establish bilateral agreements that reaffirm the support of the resolution and express a desire to cooperate and collaborate on mutually beneficial activities towards strengthening the global geodetic supply chain for the benefit of science, society, environment and economy.

17. The resolution invites Member States to commit to improve and maintain national infrastructure. Nonetheless, national agencies are currently struggling to secure funds to maintain and operate geodetic infrastructure and activities. With the support of the UN-GGCE, the work to establish bilateral agreements has started.

18. Since the adoption of the resolution, there are still severe infrastructure gaps especially in the southern hemisphere. Multilateral cooperation and commitment are crucial to change this situation. With the establishment of the UN-GGCE steps have been taken to strengthen the cooperation especially through the establishment of a Multilateral Memorandum of Understanding (MMOU) between the UN-GGCE and Member States' government departments and agencies, private sector companies and organizations.

19. Operative paragraph 6 invites Member States to develop outreach programmes to make geodesy more visible and understandable. Since the adoption of the resolution the communication and outreach activities have increased. Many Member States and organizations have produced and shared videos, documentaries, newsletters, policy briefs, speeches at conferences and workshops to communicate the importance of geodesy. The targeted communication and outreach activities and materials produced by the UN-GGCE since its opening have made it easier for Member States to communicate the value proposition of the global geodesy supply chain to politicians and decision-makers.

20. The global geodesy supply chain remains vulnerable and needs continuous commitment from Member States. No single country can do this alone, as the global geodesy supply chain depends upon the participation of countries all around the globe. To accelerate the achievements of the Sustainable Development Goals and derive societal, environmental and economic benefits, the need to act to strengthen international cooperation and commitment is as imperative now as it was ten years ago.

III. Activities of the Subcommittee during the intersessional period

Fifth Plenary Meeting

21. The fifth plenary meeting of the Subcommittee on Geodesy was held from 10 to 14 March 2025 at the UN Campus in Bonn, Germany, bringing together 54

participants alongside the third meeting of the International Advisory Committee of UN-GGCE. The session opened with an update on Bureau membership, announcing the appointment of Uruguay to replace Argentina. The Subcommittee highlighted its ongoing support for regional meetings, the Joint Development Plan, the Multilateral Memorandum of Understanding (MMOU), and initiatives promoting land–sea geodetic integration.

22. A major topic of discussion was the global shortage of geospatial professionals. Proposed measures to address this included the creation of structured mentoring and internship programmes, strengthened regional collaboration, and the development of targeted training resources.

23. Regional Working Groups and international partners (IGS, ICG, IAG, FIG, and NASA) shared updates on their respective geodetic programmes and collaborations. The meeting also considered the growing role of artificial intelligence in geodesy. Discussions also addressed upcoming reports and regional workshops currently being prepared. Notably, a 10-year anniversary session to commemorate General Assembly resolution 69/266 was proposed for the 15th session of the Committee of Experts, although logistical and financial constraints were noted as potential challenges.

Collaboration activities with the UN-GGCE

24. The joint session held in March 2025, highlighted the close collaboration between the Subcommittee and the UN-GGCE on advancing the First Joint Development Plan on Global Geodesy, implementing the Multilateral Memorandum of Understanding (MMOU), and supporting global geodetic capacity development.

Working group activities

25. Members of the working groups on the Global Geodesy Needs Assessment and the State of Geodesy report, substantially contributed to the Global Geodesy Needs Assessment report and the first Joint Development Plan for Global Geodesy. The UN-GGCE reports on these activities.

(a) Capacity and Education Working Group. This Working Group's (WG) primary focus remained on building networks to extend the scope and effectiveness of the outreach, education and capacity building efforts of the UN-GGCE. The International Federation of Surveyors (FIG) Regional Networks are already in place for the Asia-Pacific, Africa and Americas regions. The WG developed the membership in these groups as active participants in regional UN-GGIM Geodetic Reference Frame (GRF) WG's to broaden outreach beyond the usual Member States. Nascent efforts began on engaging with Europe and Arab States regions to revitalize GRF WG's and develop an extended network beyond the core group of Member States. As these contacts are developed into a network, they are connected to the UN-GGCE for a more comprehensive global effort at capacity development. The WG continued to seek organizations that could either provide or provide funding or subject matter expertise to aid the UN-GGCE's effort to build a comprehensive list of assets for global and regional capacity building and education efforts.

(b) Task Force on Marine-Land-Cadastre Integration. The Subcommittee collaborated with the UN-GGCE to engage with the standards community on integrating geodesy for the cadastral, maritime and terrestrial domains. In particular, the Open Geospatial Consortium (OGC) led the Federated Marine SDI Phase 5 (2024) Project to codify Best Practices necessary for integrating land and marine data. The focus was in developing a common geospatial ecosystem spanning the

shoreline to provide a common framework for evaluating impacts from a variety of areas including coastal inundation and marine transportation. The addition of a cadastre layer amplified and clarified the specific impacts to coastal communities. During the intersessional period, efforts focused on developing demonstrator projects that brought together marine and terrestrial data in an attempt to find issues at the shoreline from which best practices and standards will be developed. Additionally, the Subcommittee engaged with the International Hydrographic Organization (IHO) to further integrate marine and land domains with common standards.

Frequency protection

26. Members of the Subcommittee worked together with the UN-GGCE, and representatives of the Committee on Radio Astronomy Frequencies (CRAF) of the European Science Foundation and the International Association of Geodesy (IAG) on the crucial matter of securing the operation of geodetic VLBI observations by protection of frequencies in the radio spectrum. VLBI as a unique and fundamental geodetic technique underpins high-accuracy positioning by observing weak cosmic radiation using a global network of radio telescopes. The increasing demand for active use of the radio spectrum by our modern societies, in the relevant VLBI frequency bands and adjacent to them, poses a significant challenge to VLBI observations. Accurate and reliable operation of satellites depends on the knowledge of their position in space, as well as Earth's position. An active emission of radio signals can interfere with VLBI observations, which can impair satellite service operations. The regular VLBI observations are essential for tracking the positions of both satellites and Earth. Efforts are underway to plan towards the establishment of a new agenda item for the World Radiocommunication Conference, in the year 2031 (WRC-31), which could be approved for the WRC-31 agenda, based on the related negotiations, by the upcoming WRC in 2027. The results of this agenda item, represented by necessary provisions for the protection of dedicated spectrum to be used by VLBI observations in the Radio Regulations, will ensure its long-term availability.

Outreach and communication

27. Together with the UN-GGCE, the Subcommittee has been engaged to bring the need for a more sustainable global geodesy supply chain to the attention of the wider United Nations system and community. The Subcommittee has consulted Permanent Missions to the United Nations to find suitable measures and discussions are ongoing. Further, contact has been established between the UN-GGCE and the Norwegian government, resulting in an invitation to the Head of UN-GGCE to deliver a keynote presentation about the global geodesy supply chain at the United Nations Internet Governance Forum, held in Norway in June 2025.

IV. Geodesy groups within UN-GGIM regional committees

28. During the tenth meeting of the UN-GGIM: Africa, held in Addis Ababa from 28 October to 1 November 2025, the Regional Committee agreed to establish a working group on Geodesy, to ensure proper coordination and collaboration on the realization of the African Regional Reference Frame (AFREF) geodetic infrastructure. This Working Group, led by Côte d'Ivoire, discussed the importance of Member States aligning their national geodetic frames with the Global Geodetic Reference Frame and emphasized the need for a unified vision to prevent divergence. The involvement of civil society and other stakeholders was highlighted, along with the need for financial support and funding.

29. UN-GGIM: Americas: The Geodetic Reference Frame for the Americas (GRFA) Working Group is led by Uruguay. The WG chair is also the president of SIRGAS (Geodetic Reference System for the Americas), which implements the global geodetic supply chain through the efforts of 23 nations in the Americas. In the last year, SIRGAS has made significant progress in integrating Caribbean countries, with the addition of Jamaica, bringing it closer to full implementation of the global geodetic supply chain in the region. During the 2024–2025 period, SIRGAS has developed various education, training, and outreach activities on geodesy at the regional level. Activities included: a school on "Real Time" positioning; the SIRGAS 2024 Symposium that involved over 400 scientific and technological participants – emphasizing the application of the global geodetic supply chain as both the realization of SIRGAS geodetic reference framework and collaborative capabilities; institutional strengthening in Costa Rica and Bolivia where new GNSS Processing Centers were established; collaborating with the of UN-GGCE for regional dissemination of geodesy related knowledge; and a virtual school on the Terrestrial Reference Frame covering the most important concepts on the definition, implementation, and maintenance of global, continental, and national reference frames, as well as their importance in various applications. These activities reflect the dual nature of the GRFA and SIRGAS and the ongoing commitment to education, regional cooperation, and strengthening geodetic capacities in the Americas.

30. UN-GGIM: Arab States: The Geodetic Reference Frame Working Group (GRF-WG), chaired by Qatar, is currently engaged in advancing geodetic development across the Arab region through several initiatives. The GRF-WG is preparing a technical reference document articulating the significance of a unified Arab Geodetic Reference Frame (ARABREF), leveraging insights from UN-GGCE publications and regional best practices. It is also assessing geodetic infrastructure and capacity-building needs across Arab countries to identify gaps and inform future initiatives. In response to recommendations from the eleventh UN-GGIM Arab States Committee meeting, held in Doha in February 2024, the group is supporting the implementation of the ARABREF project under the International Association of Geodesy (IAG). An official letter was submitted by the Chair of UN-GGIM:AS, and coordination efforts are ongoing with the IAG, including the preparation of the Terms of Reference and the establishment of a steering committee composed of Arab geodesy experts. At the twelfth UN-GGIM Arab States Committee meeting in Jeddah, Saudi Arabia, in February 2025, the GRF-WG presented updates on global geodesy efforts, national experiences, and the role of the UN-GGCE. The group now recommends developing an implementation plan aligned with the strategic vision approved in Doha, encouraging countries to nominate national representatives, support IAG registration for ARABREF, and consider signing the MMOU with the UN-GGCE. Saudi Arabia’s appointment as Co-Chair of the GRF-WG (2025–2028) aims to ensure leadership continuity. Data-sharing limitations and the need for tailored capacity-building were noted as ongoing challenges requiring collective attention.

31. UN-GGIM: Asia Pacific: The Working Group on Geodetic Reference Framework is collaborating with IAG to develop and maintain the Asia-Pacific Reference Frame, APREF, and ensures stable access to the global geodetic reference frame in the region. The Working Group also conducted an annual GNSS observation campaign, the Asia Pacific Regional Geodetic Project (APRGP) and nine countries in the region contributed to the APRGP to further densify the regional frame. The working group organized several geodesy capacity development events in the region during the intersessional period, including the Workshop on Sustainable Operation of GNSS CORS Network, co-organized by the working group, IAG, FIG and the Survey of India in conjunction with the thirteenth plenary meeting of UN-GGIM Asia Pacific.

32. The Community of Interest on Geodetic Reference Frames: Europe (GRF Europe), established under UN-GGIM: Europe, is the regional working group on geodesy in Europe. As a relatively new group, GRF Europe is still in its development phase but is gaining momentum through the active engagement of Member States. While EUREF, the IAG sub-commission for the regional reference frame, is responsible for the realization of ETRS89, GRF Europe focuses on policy dialogue, awareness and engagement, rather than playing a direct technical role. Since the eleventh UN-GGIM Plenary meeting, GRF Europe has contributed actively to the UN-GGCE capacity development workshop for Europe, participating in presentations and discussions. A webinar titled 'Quo Vadis Geodesy' was organised in which the UN-GGCE's Hidden Risk report and the concept of a European Master of Science in Geodesy were presented. Members of GRF Europe have also played a key role in communicating the relevance of geodesy and promoting awareness on the work of the Committee of Experts, the UN-GGCE and the Subcommittee on Geodesy within European networks. The group has supported EUROCONTROL in the development of the report 'Coordinate Reference Systems: Basic User Guide', which is intended for Air Navigation and Aeronautical Information Service Providers. The group is currently contributing to the update of the UN-GGIM: Europe strategy, with the shared ambition to assume a more active role in supporting the implementation of the Joint Development Plan and helping to coordinate Europe's contribution to the global geodetic effort.

V. Next steps

33. In the coming intersessional period, the Subcommittee will continue to collaborate with and assist the UN-GGCE, its International Advisory Committee (IAC), partners, and other relevant stakeholders. The Subcommittee will also continue to evaluate its work program to avoid duplication of work. A particular focus will be on actions defined in the Joint Development Plan on Global Geodesy, on improved Governance and establishing Memorandums of Understanding as well as bilateral Memorandums of Agreement. In addition, the Subcommittee will continue to collaborate with the UN-GGCE to raise awareness, including among regulatory spectrum management authorities about the fundamental importance of geodetic VLBI and will advocate for the improved recognition and protection of geodetic VLBI activities.

34. The Working Group on Capacity and Education will continue coordinating efforts regionally with a focus on developing a network between the UN-GGCE and regional partners. The collaboration will continue with the International Federation of Surveyors, the International Association of Geodesy, the UN-GGIM regional committees, the UN-GGIM Academic Network, and other relevant regional organizations. A key focus will be on developing a network between national and regional requirements and those who can meet the requirements while involving the UN-GGCE to ensure continuity of effort globally.

35. The Subcommittee will continue to collaborate with the Expert Group on Land Administration and Management, Working Group on Marine Geospatial Information, Working Group on Policy and Legal Frameworks, and the UN-GGCE to advance consideration related to the integration of terrestrial, maritime, built and cadastral domains and to support and better implementation of the global geodetic supply chain.

36. The Subcommittee intends to establish a Working Group on frequency protection for geodetic VLBI in collaboration with the UN-GGCE. Member state representatives from all 5 UN-GGIM regions should be part of the Working Group, as well as representatives from the UN-GGCE, the International VLBI Service (IVS), the Committee on Radio Astronomy Frequencies (CRAF), the Radio

Astronomy Frequency Committee in the Asia-Pacific region (RAFCAP), and similar Committees in the other Regions.

37. The Subcommittee plans to convene its sixth plenary and in-person meeting in conjunction with the meeting of the IAC of the UN-GGCE during the upcoming intersessional period.

VI. Recommendations

38. The Subcommittee encourages Member States and relevant stakeholders to join and actively support the Multilateral Memorandum of Understanding (MMOU) as a vital instrument for enhancing global geodetic collaboration. The MMOU should be utilized to promote national-level dialogue and increase awareness of the strategic significance of geodesy.

39. Further, Member States are encouraged to establish bilateral agreements to strengthen cooperation in geodesy and support the global geodesy supply chain. Such agreements can facilitate the sharing of expertise, data, and infrastructure, and contribute to the long-term sustainability and resilience of global geodetic systems.

40. Member States are also encouraged to take proactive measures to safeguard geodetic VLBI through appropriate international regulatory frameworks and national policy instruments. In particular, Member States are invited to register geodetic VLBI sites as Earth Stations with the ITU Radiocommunication Sector, in accordance with relevant guidelines. Furthermore, Member States are invited to engage in the relevant regional / interregional discussions and preparations towards a WRC-31 agenda item to ensure the long-term availability of protected spectrum for VLBI operations. Additionally, Member States are urged to establish national frequency protection or coordination zones around geodetic observatories to ensure the continued integrity of VLBI operations.

41. To support the 2030 Agenda, Member States are encouraged to adopt the First Joint Development Plan for Global Geodesy as a guiding framework to strengthen national geodetic capacity. Developed through global consultation and available in all six UN languages, the Plan outlines key actions to reinforce the global geodesy supply chain. Member States are urged to integrate this into national strategies and capacity development programs.

42. Recognizing that national economies increasingly depend on revenues generated by satellite-based services - services which in turn rely on geodetic capabilities - Member States are encouraged to actively engage in the work of the Subcommittee and the geodesy working groups of the regional committees. Such participation will help strengthen national expertise and capacity in geodesy.

VII. Points for discussion

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

(a) Take note of the present report, the work undertaken and progress achieved by the Subcommittee on Geodesy, including its substantial efforts to advance the critical understanding, awareness and recognition of geodesy as a vital foundation of the global geospatial and Earth observation infrastructure.

(b) Consider how Member States may establish bilateral or multilateral arrangements to strengthen geodetic cooperation and contribute to the global geodesy supply chain, and provide guidance on practical modalities, key elements for such agreements, and the role of international mechanisms in facilitating these efforts.

(c) Consider ways to further strengthen international commitment to sustaining and contributing to the global geodesy supply chain, and in this regard, to explore opportunities to enhance political will, secure long-term investment and operational continuity, and promote recognition of geodesy's strategic importance across Member States.

(d) Consider approaches for engagement in the World Radiocommunication Conference (WRC) processes to ensure the protection of frequency bands critical to geodetic techniques, including Very Long Baseline Interferometry (VLBI), and to examine strategies to enhance the representation of geodetic interests within the International Telecommunication Union (ITU) framework promoting the recognition of geodesy's critical role in global infrastructure and the participation of its Member States in the regional preparation towards WRC-27/31.

(e) Provide guidance on options for elevated resource mobilization and enhanced participation to support the ongoing work of the Subcommittee, the geodesy working groups of the regional committees, and the United Nations Global Geodetic Centre of Excellence (UN-GGCE), and to encourage Member States and relevant stakeholders to actively contribute.

(f) Take note that the Subcommittee plans to organize its sixth plenary and in-person meeting of the Subcommittee on Geodesy in conjunction with the meeting of the International Advisory Committee of the UN-GGCE during the upcoming intersessional period.