SMART SURVEYORS FOR LAND AND WATER MANAGEMENT Presented at the FIG & Working Week's Presented at the FIG & Working in the Netherla. 21-25 June 2021 in Wirthally in the Netherla. **CHALLENGES IN A NEW REALITY**



Johannes Bouman

Update on the UN Global Geodetic Centre of Excellence (GGCE)

Coordination of Global to Regional Geodetic Efforts through the United Nations 22 June, 17:30 – 19:00













Content

- UN resolution Global Geodetic Reference Frame (GGRF)
- Motivation and basis for establishment of the Global Geodetic Centre of Excellence (GGCE)
- German application for the GGCE role and tasks
- How the GGCE may support the GGRF
- What's next?











Global Geodetic Reference Frame - GGRF

- UN-GGIM resolution for a "Global Geodetic Reference Frame for Sustainable Development (GGRF)"
- Adopted on 26 February 2015 by the UN General Assembly, the highest-ranking UN body
- GGRF is the first geoscience-related resolution
- Main GGRF goals:
 - Establish an authoritative, reliable, highly accurate, and global, geospatial referencing infrastructure
 - Support the collection, integration and utilization of all other geospatial data
 - Improve earth observation and positioning









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Role of the UN-GGIM Subcommittee of Geodesy

- In 2016 the "Subcommittee on Geodesy" (SCoG) was established
- Main tasks of the SCoG:
 - Develop the GGRF Road Map and GGRF implementation plan
 - Addressing five focus areas:
 - Governance
 - Geodetic Infrastructure
 - Policies, Standards and Conventions
 - Education, Training and Capacity Building
 - Communication and Outreach



Source: INEGI









Many players to sustain the GGRF

To sustain the GGRF the support and cooperation of Member States and organisations are needed.

Global players, amongst others:

- Member States
 - Build and maintain the geodetic infrastructure
- International Association of Geodesy: IAG
 - operational services and product delivery
- International Federation of Surveyors: FIG
 - education, training and capacity development
- United Nations (Statistics Division)
 - works with and supports Member States





Why we need to work together to sustain the GGRF, what needs to be done and who can help.







New player: Global Geodetic Center of Excellence

The Subcommittee on Geodesy was tasked to develop a

- Position Paper on "Sustaining the GGRF"
 - describes the current state and future requirements of the GGRF
 - introduces a range of work packages for each of the five focus areas
 - introduces the potential and role of a Global Geodetic Centre of Sector And Sector Centre of Sector And Sector Centre of Sector And Sector Centre of Sector Centre
- Concept Paper on "Establishing a Global Geodetic Centre of Excellence" (GGCE)
 - describes the potential and envisaged tasks of the GGCE
- Both reference documents were submitted to UN-GGIM-10 in 2020



INTEGRALATION MANAGEMENT Subcommittee on Geodesy Winiok: 32 July 2020 **Position Paper on** Sustaining the Global Geodetic Reference Frame A plan to help achieve the long-term accuracy and accessibility of the Global Geodetic Reference Frame 1. Introduction DRAFT DOCUMENT FOR CONSULTATION UNITED NATIONS COMMITTEE OF EXPERTS ON GLOBAL GEOSPATIAL 1.1 Background INFORMATION MANAGEMENT The Giologi Geodetic Reference Subcommittee on Geodesy decisions and program deliros nationally integrated perspatie Vierness 20 July 3020 upon for social survivouments monitoring of progress of the linaster Rick Reduction, C **Concept Paper on Establishing a Global Geodetic** Centre of Excellence The OORF underpass all aspe mapping and partigation fields for errol explanating, industria Team at transactions, intellig-Background a letrespectorus, insensestan situat alignment of useful de The Oleval Geodesic Reference Frame (GGRF) is the Resultance for evidence-based policies fections and program delivery. The GGRT and oping the utilisation and management of nationally computed groupstied inflationics, and in word to monitor our dynamic Earth. It is related upon for social, services metal and accountic initiatives, Earth science, the meanwing and constraining of programs of the 2036 Agenila for Scotlanatile Development, the Sendar Francework for Disaster Rold Federation, the Speal Manual Developing States Accelerated Modellans of Action (SAMOA) Petryany and office alched, remined and national development aprents and Recognizing the growing need for a high quality and costainable UGRJ to upport good decision making to an ever-interesting location-based society, with inclusive social progress. ervironmental statisticability and economic development, the UN General Amerikiy adjusted exclusion 69/2001 in February 2012, entitled 'A Oliobat Geodetic Reference Frame for standable Development a the minth semantic of the United Nations Committee of Experts on Global Georgiatia oformation Managament (UN-OODd), in 2019, in adopting docision 9/104, the Committee of inparts requested that the Subcommittee on Onoriesy (The Subcommittee) 'explore a number of dalities to halance the longer term mining, stability and operational requirements of the GGRF actuations the establishment of a stabul encodetic control of must leave to ecoperature with UN

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Tasks of the Global Geodetic Centre of Excellence

Tasks of the GGCE are tailored to the five focus areas:

- Enhance global cooperation and coordination
- Strengthen geodetic infrastructure
- Assist Member States in line with standards, policies and conventions
- Support education, training and capacity building
- Improve communication and raise awareness





Establishment of the GGCE in Germany

Offer of the German Federal Government was accepted and supported at the 10th Session of UN-GGIM (2020) The GGCE in Germany

- located at the UN Campus Bonn
- financed and supported by BKG
- supported with virtual secondment by Norway
- Steering Committee (UN DESA + Germany)
- Technical Advisory Committee (SCoG, IAG, FIG, Space Agencies, ...)





UN Campus Bonn; Source: Press office of the city of Bonn



6 FTE







How the GGCE may support the GGRF

- Here: not an in-depth discussion, limited to Geodetic Infrastructure
- MoU / agreements with GGCE or enabled through the GGCE
- Quality management
- Critical infrastructure











How the GGCE may support the GGRF

MoU / agreements with GGCE or enabled through the GGCE

- Example: BKG and TU Vienna have an MoU to collaborate on VLBI correlation. BEV is interested to become a partner as well.
 - Letter of Collaboration, to be approved by the GGCE Steering Committee
 - Extension: Distributed Correlator, model agreement that could be signed by MS, institutes
- Trust Fund
 - Multiple Member States donate a smaller or larger amount of money
 - Distributed Correlator is (partially) financed through Trust Fund
- Letters of Collaboration / Trust Fund could also be used to sustain contributions to the IAG Services, to support ETCB, etc.











How the GGCE may support the GGRF

- Quality management is the act of overseeing all activities and tasks that must be accomplished to maintain a desired level of excellence [Investopedia]
- Key performance indicators: e.g. latency, accuracy, reliability, ...
- QM / certification as a condition for agreements with GGCE?
- Enables the derivation of GGRF health indicators?
 - Decision makers
 - Sustainability











Critical Infrastructure

- Organizational and physical structures of such vital importance to a nation's society and economy that their failure or degradation would result in sustained supply shortages, significant disruption of public safety and security, or other dramatic consequences.
 - GNSS have become primary source of precise position and timing information, critical to safe operation of a number of critical infrastructures like the power grid, telecom networks, financial systems, etc. [European Commission / Department of Homeland Security, USA]
 - National positioning services: a critical infrastructure themselves (TBC)











Critical Infrastructure

- Geodetic Observatory Wettzell is part of the German critical infrastructure:
 - Essential to Galileo, Earth Orientation Parameters
 - Implies that other geodetic observatories, downstream data analysis, ..., are critical infrastructures
- Advantages and disadvantages
 - Audits, paper work, IT security measures, construction measures (UPS, ...), etc.
 - Contributes to GGRF sustainability & visibility and political relevance
- Possible roles of the GGCE
 - Enhance international cooperation
 - Sharing information and experience
 - Support the development of strategies for CI implementation
 - Support coordination among domestic agencies











What's next

Next Steps

- Develop participation of other partners in the GGCE
- Negotiations on a
 - 'Agreement' (streamline the tasks for the GGCE Bonn)
 - 'Verbal Notes' (agree upon the infrastructure on the UN campus)

Negotiations between the German Federal Government and the United Nations began in autumn 2020









