The International Association of Geodesy
Update

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5th Plenary Meeting of the UN-GGIM
Subcommittee on Geodesy

March 10-14, 2025
Bonn, Germany

Jet Propulsion Laboratory
California Institute of Technology

Meetings

Forum on the First Joint Development Plan for Global Geodesy

UN-GGIM
UNITED NATIONS
COMMITTEE OF EXPERTS ON
GLOBAL GEOSPATIAL
INFORMATION MANAGEMENT

Fourteenth session

United Nations

United Nations
Global Geodetic
Centre of Excellence

Forum on the First Joint Development Plan for Global Geodesy

Organized jointly by the Subcommittee on Geodesy
and the United Nations Global Geodetic Centre of Excellence
Tuesday 6 August 2024
11:30 am - 12:45 pm
Conference Room 4 (CR-4 GA Building)
United Nations Headquarters in New York

Provisional Agenda

11:30 – 11:35 am

Welcome and introduction.
[Ingrid Vanden Berghe, Administrator -General, National Geographic Institute, Belgium]

11:35 – 11:50 am

Presentation - Strengthening the global geodesy supply chain together
[Nicholas Brown, Head of Office, United Nations Global Geodetic Centre of Excellence]

11:50 am – 12:45 pm

Panel discussion

Panelists:

1. *Alison Rose, Chief of Space Division, Geoscience Australia*
2. *JN Markiel, National Geospatial-Intelligence Agency, United States of America*
3. *John Nyberg, Director, International Hydrographic Organization*
4. *Richard Gross, President, International Association of Geodesy*
5. *Albert Momo, Founder and CEO, GeoDEV International*

Geodesy in Africa at the UN Science Summit

Science Summit at UNGA79
10 - 27 September 2024

Africa Rising: Shaping Our Common Future Through Geodesy

Implementing the UN General Assembly Resolution A/RES/69/266
"Global Geodetic Reference Frame for Sustainable Development"

Friday, 27 September 2024 | 8:30 am – 3:00 pm ET (UTC-4) | on-site and online event
Location: CURE, 345 Park Avenue South, New York, NY 10010, United States

join us at
https://sciencesummitunga.com/science-summit-unga79/

science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

United Nations
Global Geodetic
Centre of Excellence

GGOS
Global Geodetic
Observing System

- Announced on the GGOS social media and web page
- To be included in the IAG and IUGG newsletters
- A keynote speech by R. Gross: *Contribution of Geodesy to Sustainable Development and Shaping Our Common Future*
- A keynote speech by A. Momo (Advisory committee of the UN-GGCE) *The Hidden Risk that Poses a Threat to Critical Infrastructure and Sustainable Development*
- Two panel sessions and a workshop including a presentation on GGOS Africa

13th Plenary Meeting of UN-GGIM Asia Pacific


India Gate

Overview | Agenda | Documents

Registration

Thirteenth Plenary Meeting of UN-GGIM-AP

26-29 November 2024

The 13th Plenary Meeting of the UN-GGIM-AP which will be held at the Bharat Mandapam, IECC on 26-29 November 2024, in New Delhi, India, hosted by Survey of India (SOI).

Capacity Development Workshop on
Sustainable Operation of GNSS CORS Network

Date: November 26, 2024
Venue: IECC, Delhi, India
Co-organizers: UN-GGIM-AP, IAG, FIG, SOI

Session 1: Challenges on CORS operation and maintenance in the Member countries

9:30 -9:35 Opening Remark	Basara Miyahara (AP WG1)
9:35- 10:00 CORS Network of India: The Nuances, Achievement and Challenges	Upendra Nath Mishra (India)
10:00- 10:20 Development of Tonga's GNSS CORS Network	Ansela Paea Fifita (Tonga)
10:20- 10:40 Successes and challenges for GNSS CORS in New Zealand	Nic Donnelly (New Zealand)*
10:40- 11:00 GNSS CORS network operation and its challenge in Japan	Basara Miyahara (Japan)

11:00 -11:30 Coffee Break

Session 2: International efforts to support GNSS CORS operation

11:30- 11:50 What we learn from the APREF project over 14 years	Guorong Hu (Geoscience Australia)
11:50- 12:15 IAG Support of GNSS Operations	Richard Gross (IAG)
12:15- 12:35 International Federation of Surveyors (TBD)	Dan Roman (FIG)
12:35- 12:55 1st Joint Development Plan for Global Geodesy	Nick Brown (UN-GGCE)*
12:55-13:00 Closing Remark	Basara Miyahara (AP WG1)

* Online/Pre-recorded presentation

Essential Geodetic Variables

Essential Geodetic Variables

- Observed variables
  - Crucial to characterizing geodetic properties of Earth
  - Key to sustainable geodetic observations
    - Positions of reference objects (ground stations, radio sources), EOPs
    - Gravity measurements (ground-based, space-based)
- Assign requirements to each EGV
  - Accuracy, spatial and temporal resolution, latency, stability, …
- Derive requirements
  - On EGV-dependent products (TRF, CRF, …)
  - On infrastructure (observing systems)
- Can be used to update GGOS2020 book
  - Bottoms-up approach to deriving requirements
    - Complements top-down approach used in GGOS2020 book (user needs)
- Established Committee within GGOS BPS
  - To create list of EGVs, assign requirements to them, etc.
  - Chair: Thomas Gruber, Germany

List of proposed EGVs

EGV	Level	Domain	Subdomain
Global Reference Frames	L3	Global	Geometry/Physical
Land Geometry	L3	Land	Geometry
Sea Surface	L3	Ocean	Geometry
Sea Level	L3	Ocean	Physical
Sea Ice	L3	Ocean	Geometry
Ice Sheets	L3	Land	Geometry/Physical
Glaciers	L3	Land	Geometry/Physical
Earth Gravity Field	L3	Global	Physical
Terrestrial Water Storage	L3	Land	Physical
Inland Water Level	L3	Land	Geometry/Physical
Earth Orientation Parameters	L3	Global	Geometry
Neutral Atmosphere and Ionosphere	L3	Global	Physical
Station Positions and Variations	L2	Land	Geometry
Tide Gauge Records	L2	Ocean	Geometry
Land and Marine Gravity Data	L2	Global	Physical
Regional Geoid	L2	Land/Ocean	Physical
Regional Reference Frames	L2	Land	Geometry/Physical
GNSS Satellite Orbits and Clocks	L2	Global	Geometry

51 Geodetic Products in total

- Global: 20 products
- Land: 18 products
- Ocean: 13 products

18 EGVs

- Level 3: 12
- Level 2: 6

Domain

- Global:
- Land:
- Ocean:

Subdomain

- Geometry
- Physical

(source: Gruber et al., 2024)

Overview of EGVs and Geodetic Products

Products	Global Reference Frames	Land Geom.	Sea Surface	Sea Level	Sea Ice	Ice Sheets	Glaciers	Earth Gravity Field	Terrestr. Water Storage	Inland Water Level	Earth Orient. Param.	Atmosph. and Ionosph.	Station Positions and variation	Tide Gauge Records	Land and Marine Gravity Data	Regional Geoid	Regional Reference Frames	GNSS Satellite Orbits Clocks
EGV	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L2	L2	L2	L2	L2	L2
ECV			X	X	X	X	X		X	X		X						
EOV			X	X	X													
Domain	Global	Land	Ocean	Ocean	Ocean	Land	Land	Global	Land	Land	Global	Global	Land	Ocean	Global	Land/Ocean	Land	Global
AGM																		
CPO																		
CRF																		
DEM																		
DOT																		
DTM																		
ESD																		
GFQ																		
GFV																		
GGM																		
GIM																		
GIT																		
GMC																		
GRF																		
GSC																		
GSO																		
HRF																		
HSO																		
IMC																		
IST																		
LGM																		
LOD																		
MDT																		
MGC																		
MGM																		
MRLW																		
MSL																		
MSS																		
PKM																		
PM																		
RGM																		
RGRF																		
RMSL																		
RHRF																		
RSLC																		
RTRF																		
RWLC																		
SES																		
SIE																		
SIV																		
SLA																		
SLC																		
SPTS																		
TDM																		
TGFM																		
TGM																		
TGR																		
TRF																		
TWSA																		
UT1																		
WVC																		

Primary geodetic products directly related to the EGV

Geodetic products that provide important information to the EGV.

Geodetic products indirectly linked to the EGV.

(source: Gruber et al., 2024)

GGOS Strategic Implementation Plan

GGOS Strategic Plan 2024 – 2034

- To advocate for geodesy in major global frameworks such as the Global Earth Observation System of Systems (GEOSS), the United Nations Sustainable Development Goals, and the Sendai Framework for Disaster Risk Reduction.

- To contribute to the sustainability of the United Nations Global Geodetic Reference Frame (UN-GGRF) through collaboration with key entities such as the UN Sub-Committee on Geodesy (SCoG) and the UN Global Geodetic Centre of Excellence (UN-GGCE) – scientific advice/evidence for policy development.

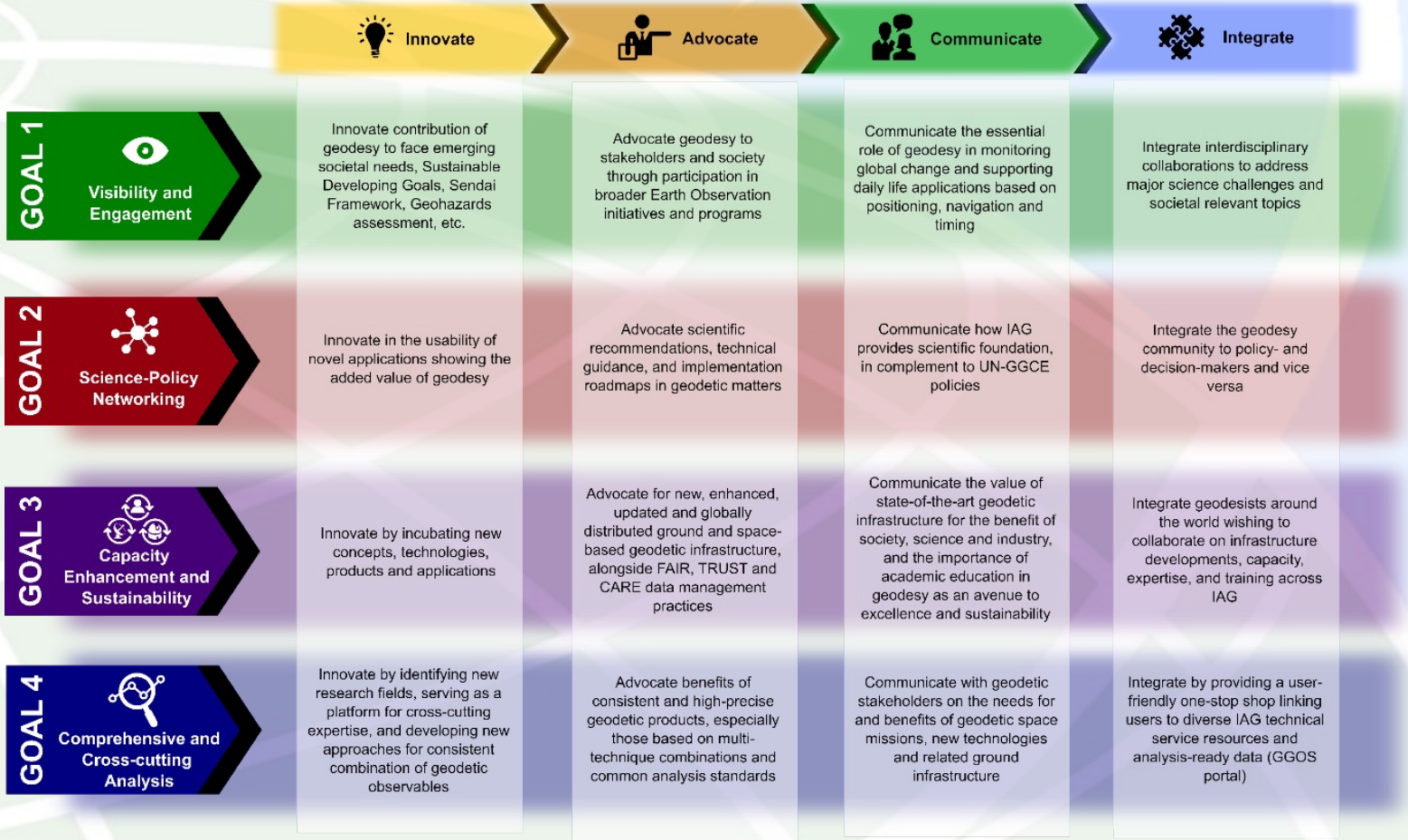
- To promote modernisation, extension, and maintenance of geodetic resources, while fostering capacity enhancement and knowledge sharing within the geodetic community, in particular developing countries and early carrier scientists.

- To provide a comprehensive platform for geodetic analysis and information-sharing, making geodetic data and resources accessible to all – GGOS Portal, FAIR and TRUST principles.

https://zenodo.org/records/10605594

GGOS Implementation Plan, Phase 2024 – 2027

- To have a better overview of the whole plan, it is proposed to have one action for each objective of the Strategic Plan.
- Each Implementation Action is made up of several activities (from one to four or five). These activities ultimately represent the work to be done.
- For each Implementation Action milestones, output, responsible, timeframe, and performance indicator are defined.



https://zenodo.org/records/13785103

GGOS Implementation Plan, Phase 2024 – 2027

Implementation activities related to geodetic information and expertise

- GGOS Requirements and Essential Geodetic Variables (EGVs) - 6 activities
- Focus Areas and Interdisciplinary Research - 8 activities
- Science-Policy Networking - 8 activities

Implementation activities related to Global Geodetic Infrastructure

- Simulations and documentation for fundamental stations - 7 activities
- Regional affiliates, GGOS Africa - 1 activity
- More satellites for reference frames - 2 activities

Implementation activities related to Standardisation, Integration and Optimisation

- Missing and new products - 2 activities
- Standards and metadata - 3 activities
- Updated geophysical models - 1 activity

Implementation activities related to Communication, Education and Outreach

- GGOS Portal and Internet Presence - 7 activities
- Networking with scholars, young people, early carrier scientists, and colleagues from developing countries - 10 activities
- Outreach and communication materials - 9 activities

GGOS Implementation Plan, phase 2024 – 2027

GOAL 1

Visibility and Engagement: Raise awareness of the benefits of geodesy to society

Action 1.1 Highlight the contribution of Geodesy to the well-being of society

Milestone

The contribution of geodesy to the well-being of society needs to be effectively communicated and recognised, leading to increased support for ongoing research, cooperation, and applications in the field.

Outputs

- Informative and visually engaging materials, including brochures, infographics, white papers, videos, etc. explaining the role of geodesy in everyday life.
- An awareness campaign through various media channels to inform the society about the importance of geodesy in achieving the United Nations Sustainable Development Goals.
- Highlighting specific case studies where geodesy has played a crucial role in measuring, monitoring, and forecasting geohazards, including protection against natural hazards and risks of extreme space weather events on critical infrastructure for daily life.
- Promotion of the relevance of GNSS technology for navigation, timing, and location-based services.
- Identification of emerging societal needs where geodesy can help.

Activities	Lead [Contributors]	Timeframe	Performance indicators
1.1.a Produce outreach packages describing geodesy's contribution to the UN Sustainable Development Goals (SDGs), the Sendai Framework, the GEO Societal Benefit Areas (SBAs) and other relevant initiatives.	GGOS-P [CO, BPS, BNO, SP, FAs, EC, GB]	2025/2026	· Two outreach packages a year.
1.1.b Demonstrate how the work of the IAG/GGOS is aligned with (or supports) the UN SDGs.	GGOS-P, IAG-P [CO, BPS, BNO, SP, FAs, EC, GB]	2025	· An article published in a popular science magazine.
1.1.c Showcase studies and reports demonstrating how geodesy contributes to monitoring and operating early warning systems for earthquakes, tsunamis, and other natural disasters.	FA-Geohazards	Continuous	· Presentations at international conferences and publications in scientific journals by experts of the FA-Geohazards.


شكراً جزيلاً
thank you
gracias
danke
謝謝
ngiyabonga
teşekkür ederim
merci
obrigado
dziękuję
bedankt
спасибо
go raibh maith agat
mochchakkeram
sukriya
kop khun krap
terima kasih
grazie
arigatô
dakujem
takk
tapadh leat
감사합니다
ありがとう
мерси
ευχαριστώ
рахмат
Баярлалаа
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matondo
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