



UNITED NATIONS GLOBAL GEOSPATIAL INFORMATION
MANAGEMENT SUBCOMMITTEE ON GEODESY

13TH SESSION GEODESY FORUM

**Towards a Sustainable Global
Geodetic Reference Frame**



UN-GGIM

United Nations Committee of Experts on
Global Geospatial Information Management

Subcommittee on
Geodesy

Positioning geospatial information to address global challenges

ggim.un.org



Moderators

Fernand Bale and Nicholas Brown
Co-Chairs, UN-GGIM Subcommittee on Geodesy

Measuring the Earth

Nicholas Brown
Director of National Geodesy, Australia

The Subcommittee's Plan

Allison Craddock
Director of IGS Central Bureau

FIG in Partnership with the Subcommittee

Diane Dumashie
President of FIG

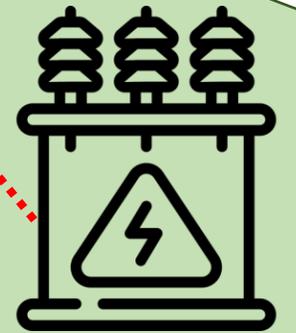
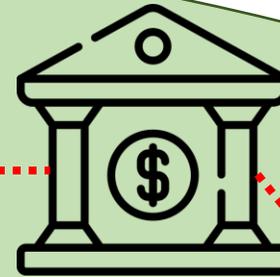
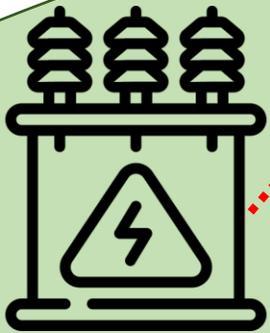
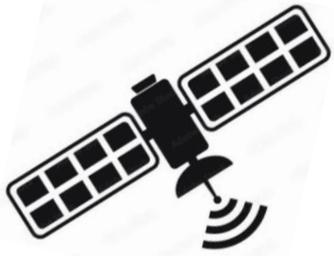
Case Study – Africa

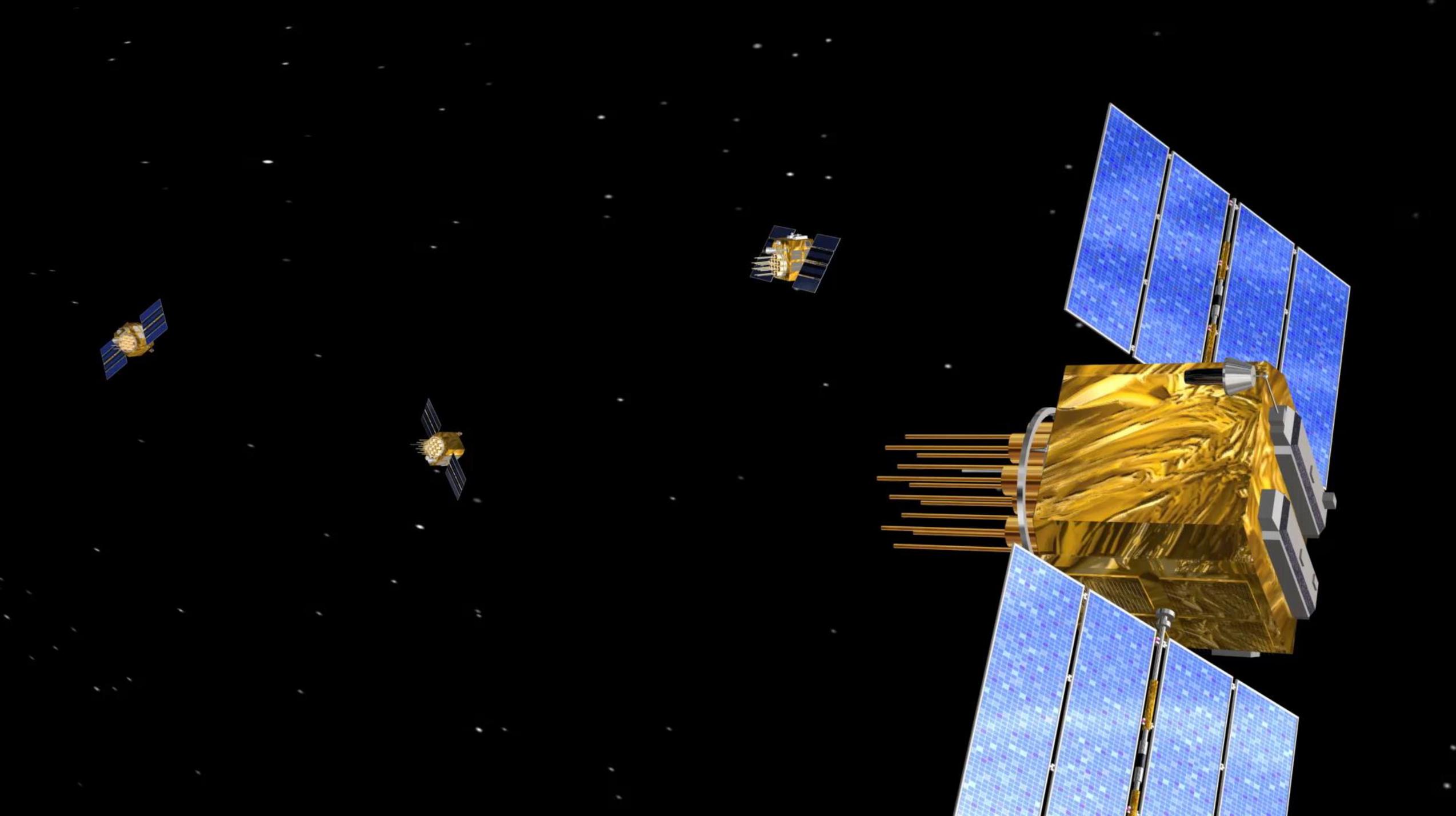
Fernand Bale
Directeur BNETD/CIGN

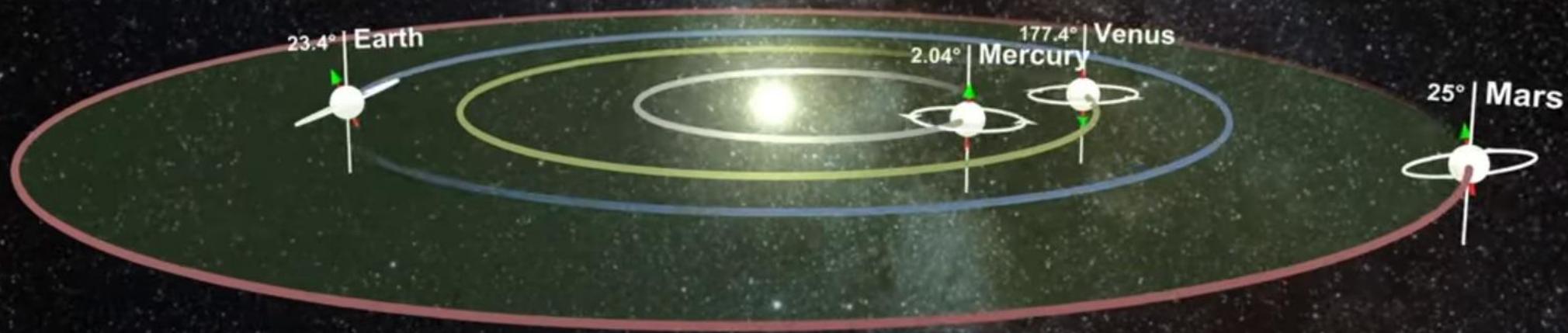
United Nations Global Geodetic Centre of Excellence

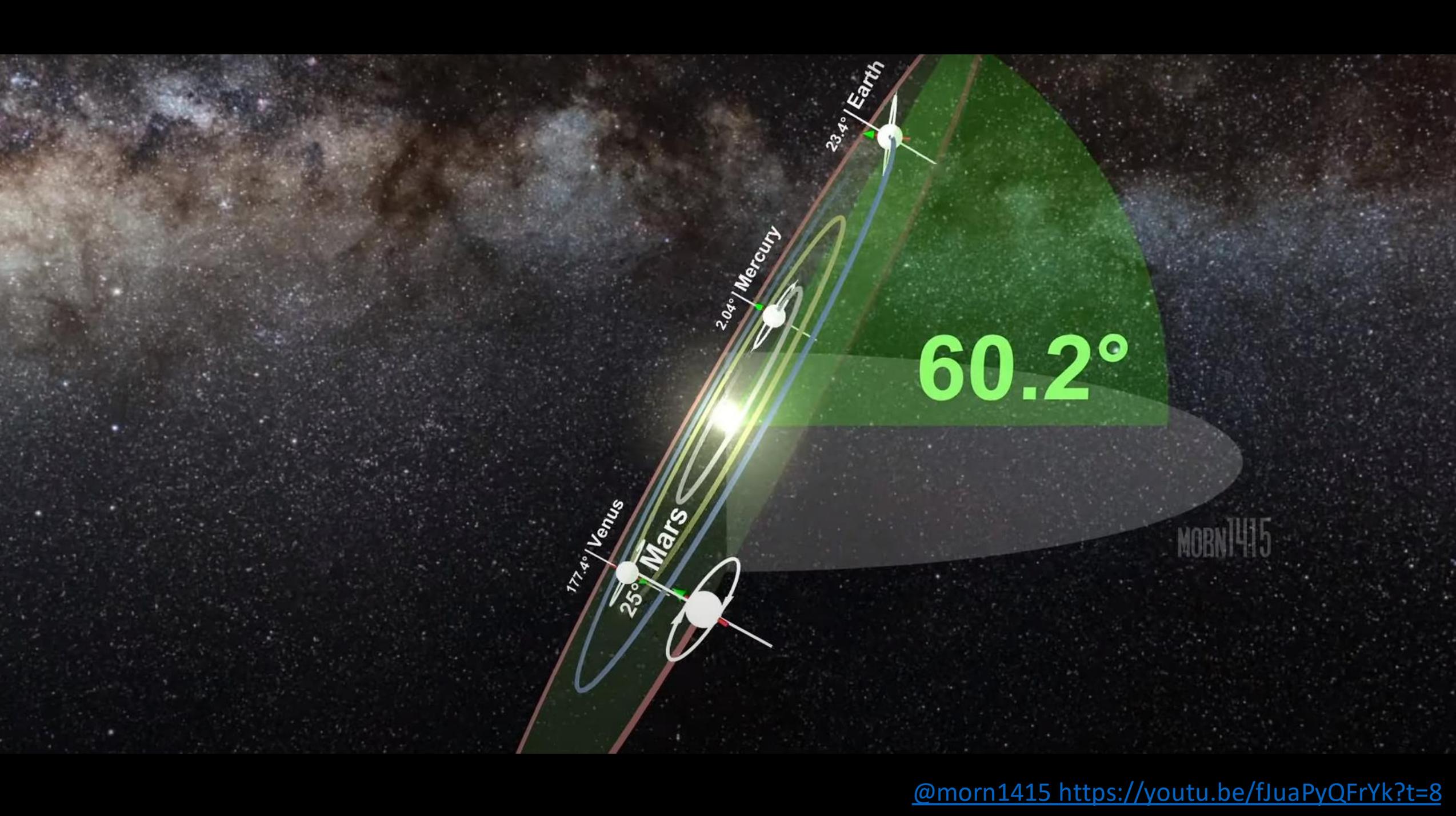
Panel discussion lead by Anne Jørgensen











177.4° | Venus

25° | Mars

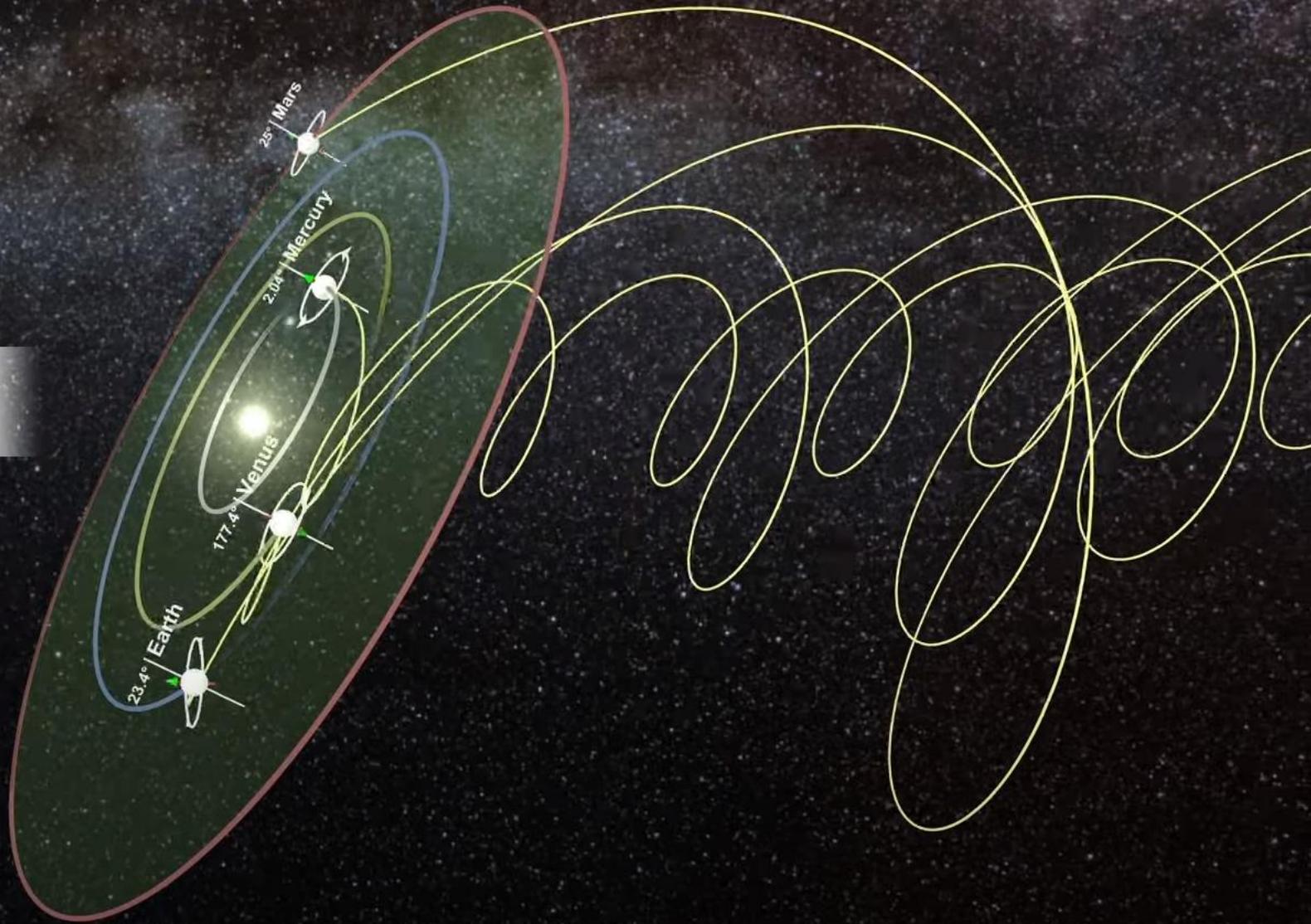
2.04° | Mercury

23.4° | Earth

60.2°

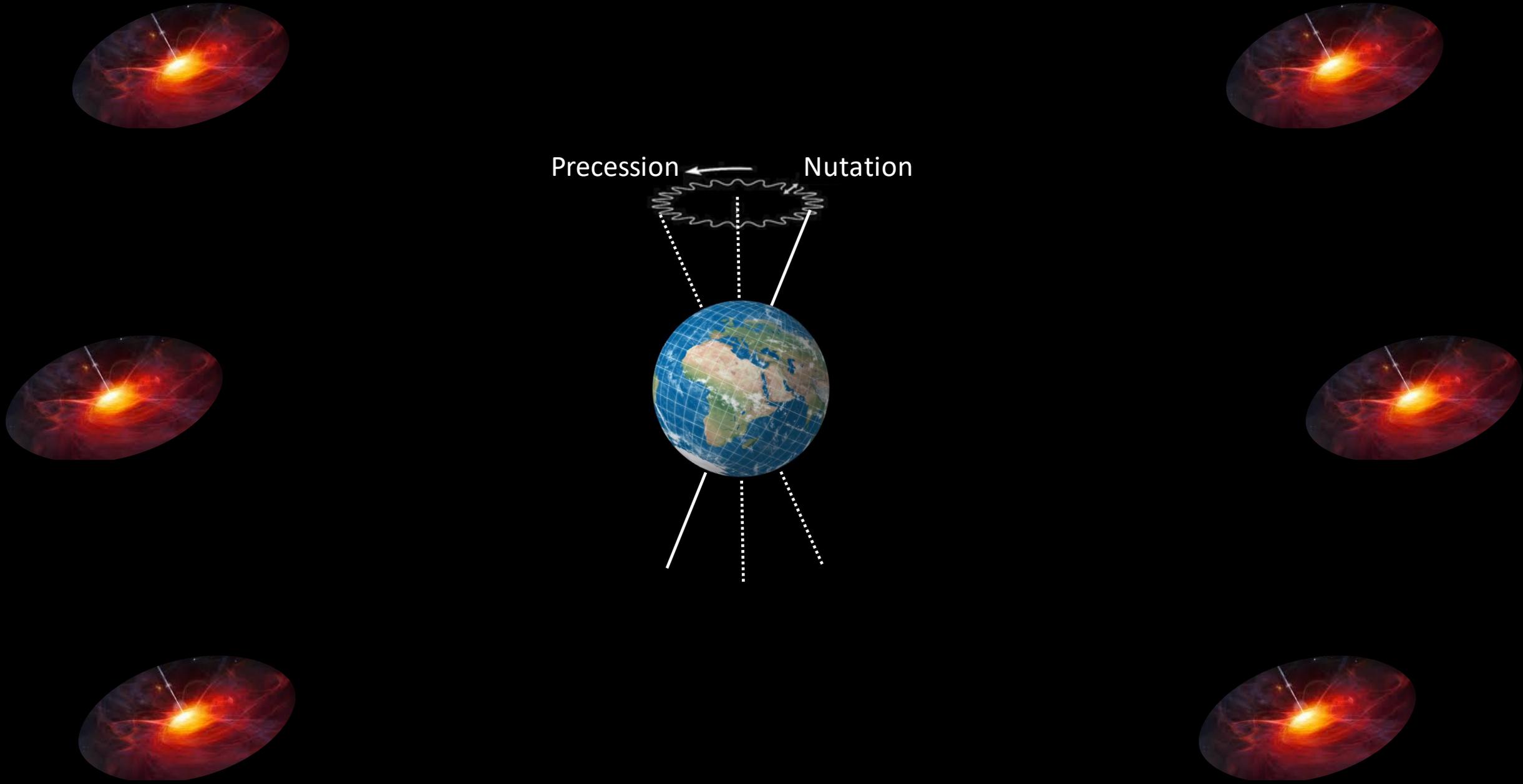
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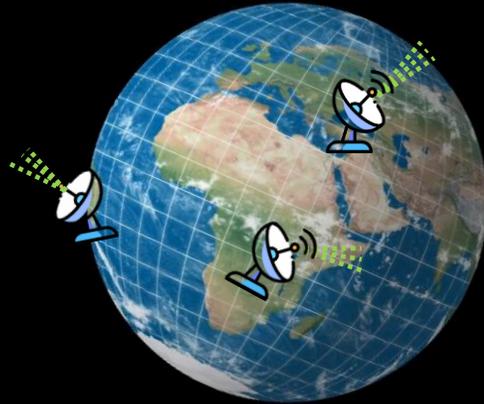
230 km/s (828,000 km/h)
143 mi/s (514,000 mph)

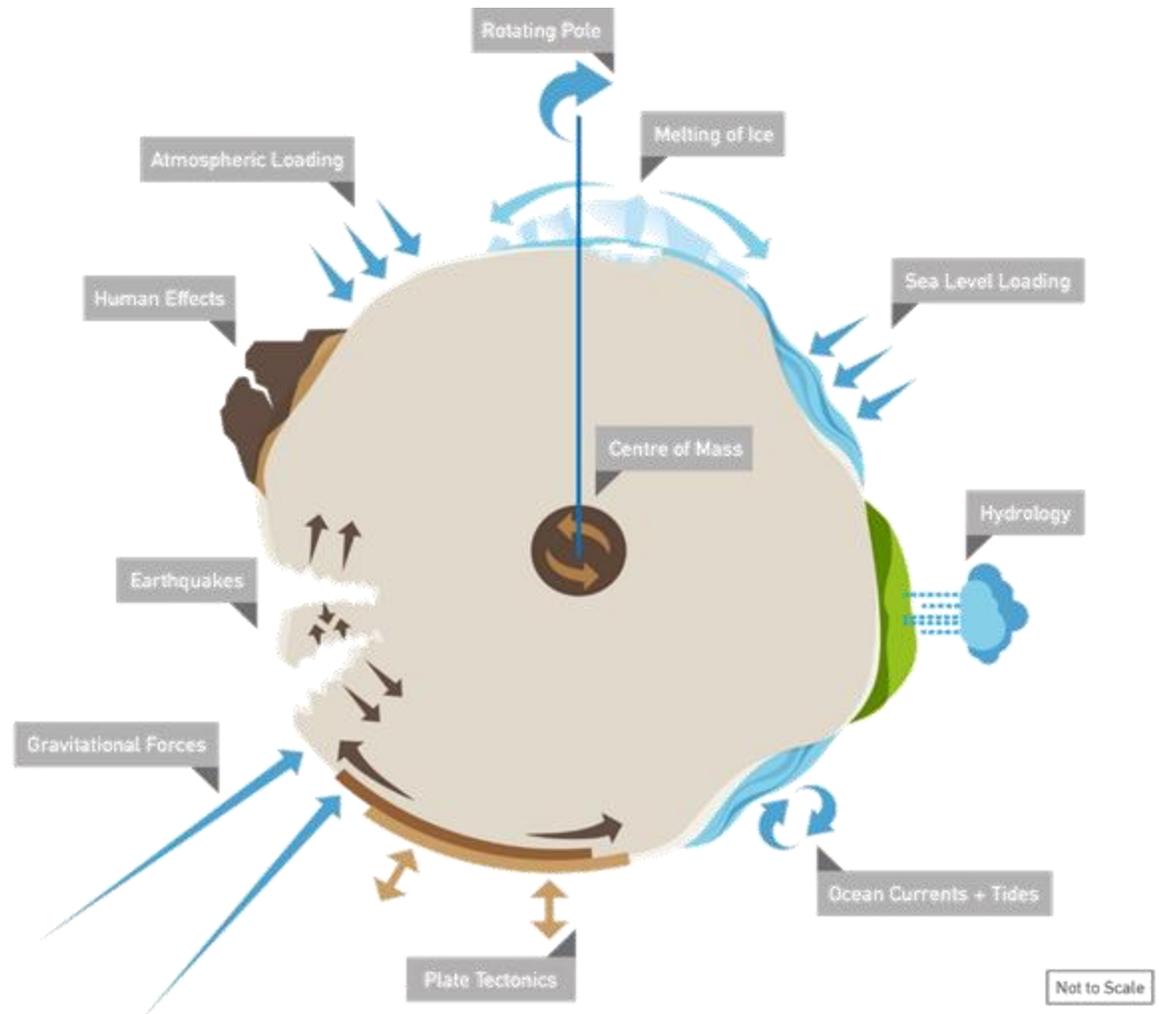
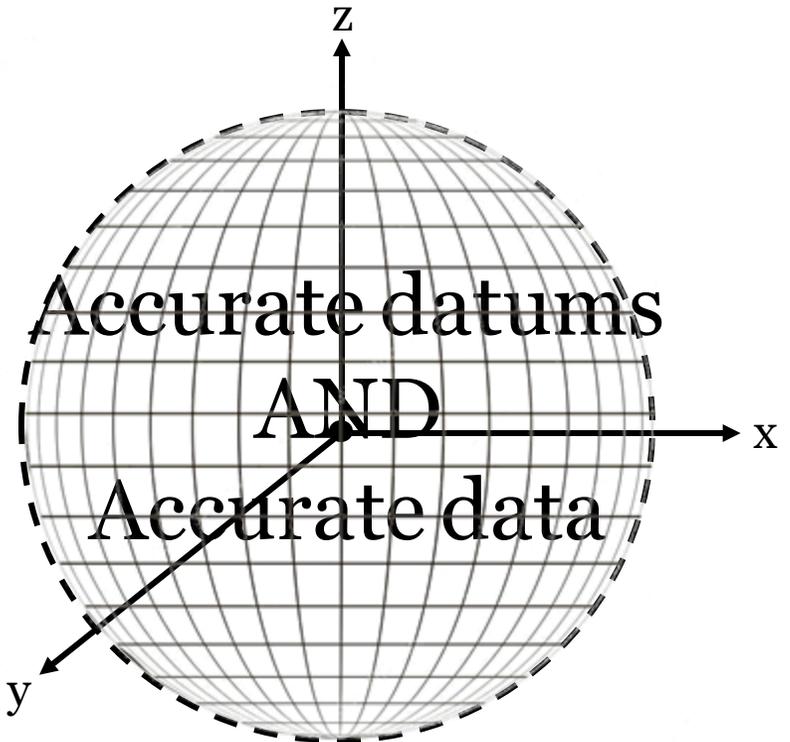




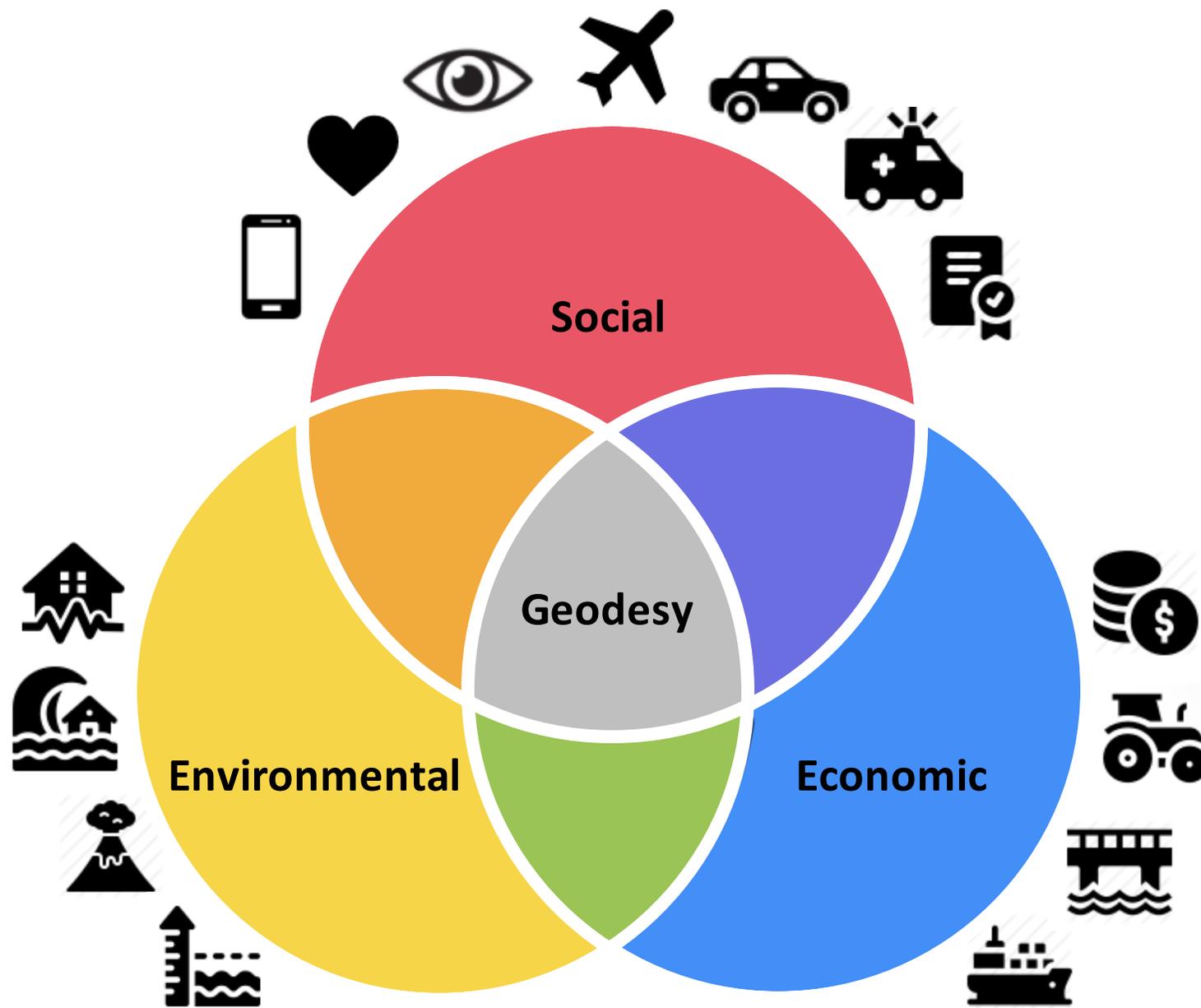








Source: Dr Anna Riddell, Geoscience Australia



Global Geodesy Supply Chain

COAL / SUN



POWER PLANT



POWER LINES



HOME SUPPLY



CHARGED PHONE



Source

Production

Transmission

Access

Application

GEODETIC
INFRASTRUCTURE



IAG SERVICES



INTERNET



SATELLITES



LOCATION
ENABLED



UN-GGIM

United Nations Committee of Experts on
Global Geospatial Information Management

Subcommittee on
Geodesy

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Panel discussion lead by Anne Jørgensen



UN GGIM 2023 Global Geodesy Forum

“Towards a Sustainable Global Geodetic Reference Frame”

The Subcommittee on Geodesy’s Strategic Plan

Allison Craddock

Director, International GNSS Service Central Bureau
National Aeronautics and Space Administration (NASA)
Jet Propulsion Laboratory - California Institute of Technology, USA

Zuheir Altamimi

Research Director, Institut National de l'Information Géographique et Forestière (IGN), and
Institut de Physique du Globe de Paris (IPGP), France

Daniel Roman

Chief Geodesist, National Geodetic Survey
National Oceanographic and Atmospheric Administration (NOAA), USA

Ryan Keenan,

International Federation of Surveyors (FIG)
UN GGCE IAC, Australia



Jet Propulsion Laboratory
California Institute of Technology

The “why” behind the “where”



- The need to know our location on earth down to the smallest possible measurement may only be satisfied by international collaborations in geodesy.
- Global geodesy is dependent on findable, usable, and inter-operable contributions from nations all around the globe, since **no single country can maintain the Global Geodetic Reference Frame alone.**
- By collaborating with the United Nations Subcommittee on Geodesy, international partners and stakeholders, the global geodetic community is able to **collectively leverage limited assets to the top of current geodetic knowledge and capability**

Revised Role for Subcommittee

In view of the establishment of the GGCE and associated IAC

ADVANCE UNEDITED VERSION

UNITED NATIONS E/C.20/2023/10/Add.1

Economic and Social Council 25 July 2023

Committee of Experts on
Global Geospatial Information Management
Thirteenth session
New York, 2–4 August 2023
Item 8 of the provisional agenda*
Global geodetic reference frame

Global geodetic reference frame

Note by the Secretariat

Summary

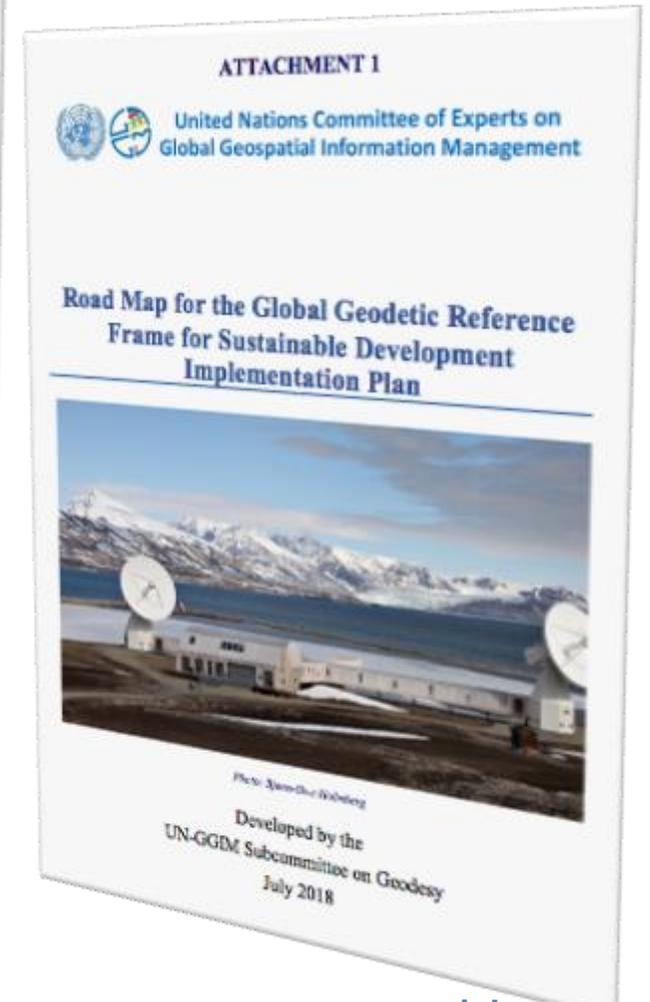
The present paper contains the report prepared by the Subcommittee on Geodesy for consideration by the Committee of Experts on Global Geospatial Information Management.

At its twelfth session, held from 3 to 5 August 2022, the Committee of Experts adopted decision 12/106, in which it welcomed the progress made during the intersessional period, including the Subcommittee's considerable efforts to grow the critical understanding, awareness and advocacy for the importance of the global geodetic reference frame as a vital global infrastructure that is of benefit to society and needs to be maintained. The Committee recognized the important collective efforts of the Subcommittee to address the complex issues facing the global geodetic community and to ensure the quality and long-term sustainability of the global geodetic reference frame in the areas of sustainable geodetic infrastructure; education, training and capacity development; geodetic standards and guidelines; outreach and communication; and suitable governance mechanisms to sustain the global geodetic reference frame. In addition, it welcomed the progress made by the Government of Germany and the United Nations to host and establish a Global Geodetic Centre of Excellence at the United Nations Campus in Bonn, Germany, which will provide dedicated resources to address some of the immediate and ongoing challenges in sustaining the global geodetic reference frame, and invited Member States to actively contribute to the work of the Centre.

The Committee of Experts supported the Subcommittee's plans to contribute to the formation of an efficient and competent international advisory committee and governance model to support and guide the establishment and strategic operations of the United Nations Global Geodetic Centre of Excellence, welcomed the offers by Member States and relevant geodetic stakeholders to contribute to the Centre and to foster greater planning and international coordination in pursuit of strengthening partnerships and opportunities enabled by global geodesy and urged a greater contribution from relevant technical experts in Member States. The Committee of Experts also noted the Subcommittee's desire to convene its third plenary meeting at the United Nations Campus in Bonn once the Centre was established.

In this present report, the Subcommittee provides information on its progress and activities, including its efforts to continue to implement General Assembly resolution 69/266. During the intersessional period, the Subcommittee worked on and revised its terms of reference and structure to align these with the future working arrangements outlined in the position paper on sustaining the global geodetic reference frame and the concept paper on establishing a global geodetic centre of excellence adopted by the Committee of Experts. The terms of reference were agreed by the Subcommittee at its fifth virtual meeting, on 13 December 2022. The Subcommittee met at its sixth virtual meeting, on 21 March 2023, which allowed its global membership to consider and discuss items related to the Subcommittee's design and development of a detailed action plan

* E/C.20/2023/1

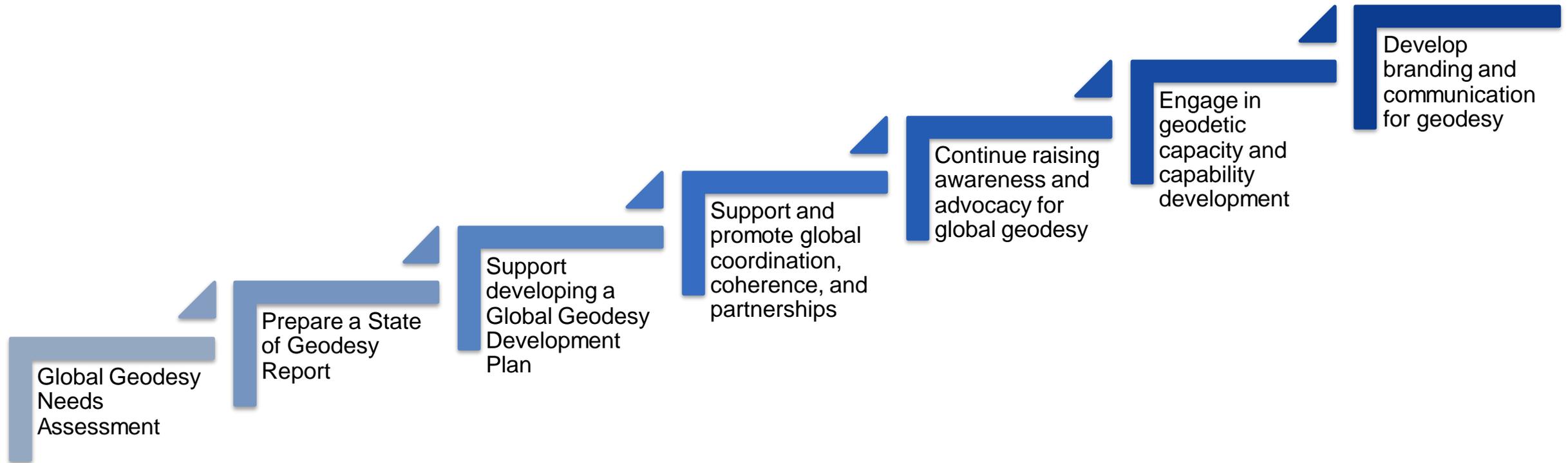


The UN GGIM Subcommittee on Geodesy's Plan for Sustaining the Global Geodetic Reference Frame



The Subcommittee's 7 Strategic Actions to Sustain the GGRF

As formulated at the Third Plenary Meeting of the Subcommittee on Geodesy, March 2023



Delivering on Strategic Actions through Collaborative Priority Areas

Subcommittee on Geodesy Working Groups (as of March 2023)



The Subcommittee's 7 Strategic Actions to Sustain the GGRF

Strategic Action #1

Conduct a **Global Geodesy Needs Assessment**



- To be done in **collaboration with partners:**
 - International Association of Geodesy (IAG)
 - International Federation of Surveyors (FIG) Commission 5 – Positioning and Measurement
- The Subcommittee will **support a stakeholder identification and mapping exercise** to be conducted by the UN GGCE



Delivering on Strategic Action 1 through Collaborative Priority Areas

Global
Geodesy
Needs
Assessment



The Subcommittee on Geodesy will coordinate with the UN GGCE, its International Advisory Committee, Partners and Stakeholders to:

Establish a Working Group to conduct a **global geodesy needs assessment** for sustaining and extending the GGRF:

- Building upon the work and analyses of previous surveys
- Serving as a guide for an integrated response
- Leveraging expertise and resources from around the global geodesy community
- Engaging, consulting, and including regional committees of the UN GGIM

The Subcommittee's 7 Strategic Actions to Sustain the GGRF

Strategic Action #2

Prepare a **State of Geodesy Report** (together with IAG and FIG)

Development and preparation of **factsheets** and **case studies** detailing geodesy's role in:

- Climate studies, adaptation, and resilience
- Space missions
- Sea-level measurement
- Earthquakes and tsunami
- Autonomous transportation
- Economic value and contribution to GDP
- Sustainable Development Goals
- Sendai Framework for Disaster Risk Reduction

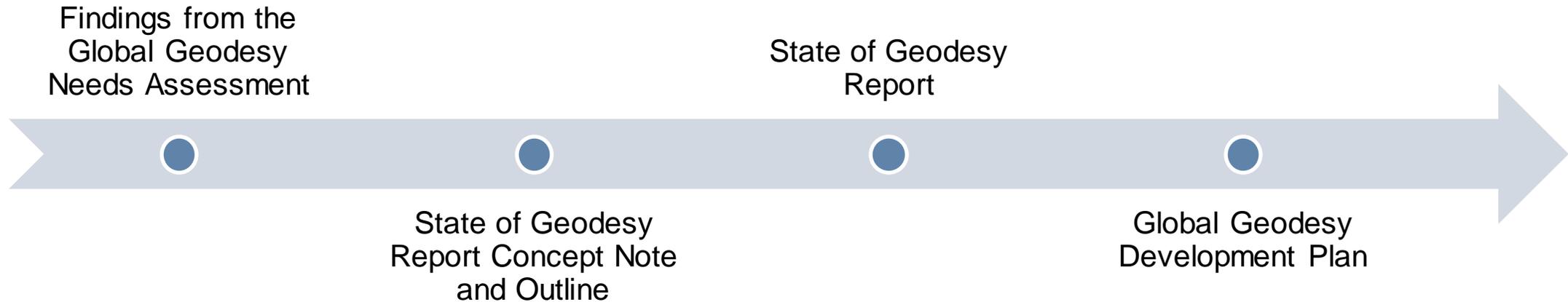
Develop a **concept note** and outline of contents for a State of Geodesy Report, incorporating findings from the Global Geodesy Needs Assessment



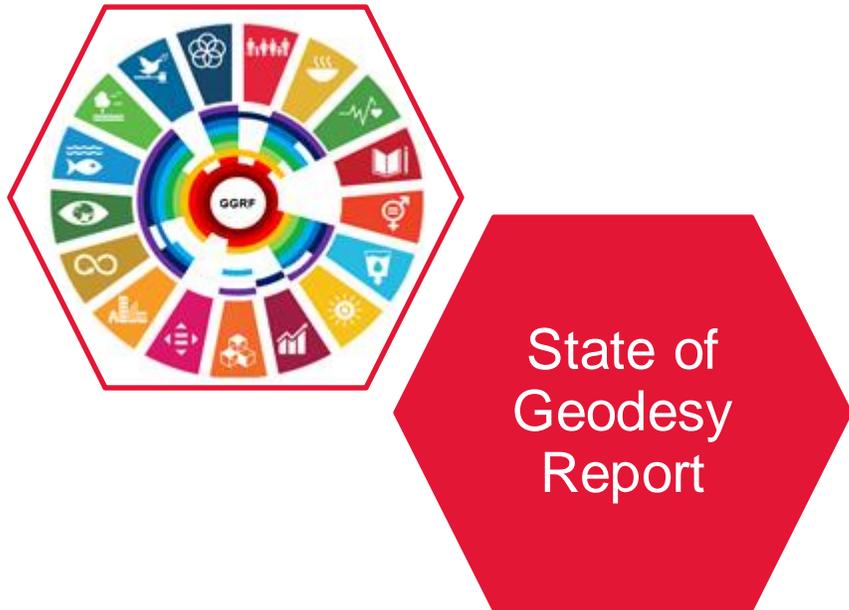
The Subcommittee's 7 Strategic Actions to Sustain the GGRF

Strategic Action #3

Contributing to a **Global Geodesy Development Plan**



Delivering on Strategic Actions 2 + 3 through Collaborative Priority Areas



The Subcommittee on Geodesy will coordinate with the UN GGCE, its International Advisory Committee, Partners and Stakeholders to:

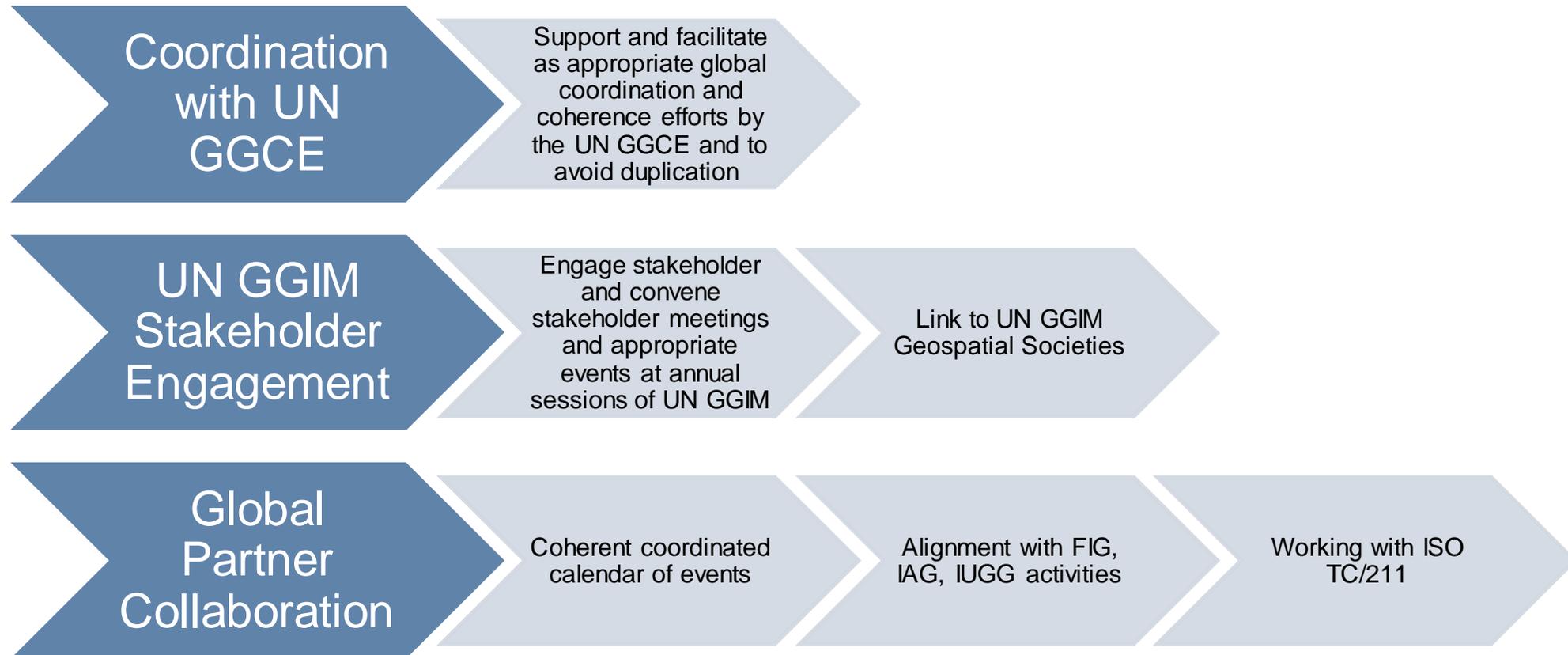
Establish a Working Group to prepare a “State of Geodesy” report to include:

- Frameworks for describing geodesy’s complex and diverse contributions to society through a series of indicators
- Information for policy makers about how the GGRF plays a critical role in delivering impactful solutions toward achieving the Sustainable Development Goals (SDGs) and informing evidence-based decision making.
- Foundation for developing a “Global Geodesy Development Plan”

The Subcommittee's 7 Strategic Actions to Sustain the GGRF

Strategic Action #4

Support and promote global **coordination, coherence, and partnerships** for a sustainable GGRF



The Subcommittee's 7 Strategic Actions to Sustain the GGRF

Strategic Action #5

Awareness and **advocacy** for global geodesy



- Convene geodesy side events at annual sessions of UN GGIM

- Support and contribute to advocacy for geodesy in global reports:
 - WMO State of the Climate
 - UNEP Global Environment Outlook
- As well as other stakeholder and partner report

- Support advocacy activities

The Subcommittee's 7 Strategic Actions to Sustain the GGRF

Strategic Action #6

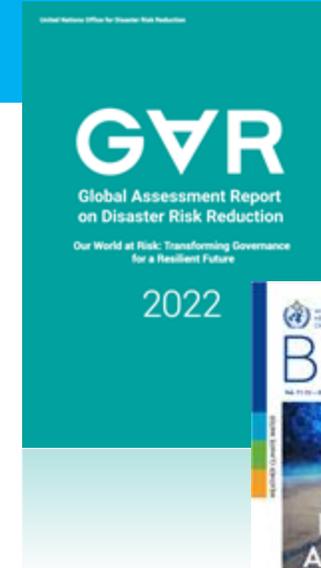
Engage in **capacity** and **capability development**



The Subcommittee's 7 Strategic Actions to Sustain the GGRF

Strategic Action #7

Develop **branding** and **communications**



Delivering on Strategic Actions 4, 5, 6, and 7 through Collaborative Priority Areas

Capacity
and
Education



The Subcommittee on Geodesy will coordinate with the UN GGCE, its International Advisory Committee, Partners and Stakeholders to:

Retain and strengthen a Working Group on Capacity and Education, guided by the Integrated Geospatial Information Framework (IGIF) Strategic Pathways, and continuing work to foster relationships with each of the regional committees of the UN-GGIM as well as non-governmental organisations (NGOs) and Intergovernmental Organisations (IGOs).

The efforts of this newly rebuilt Working Group will include – when appropriate – supporting global **coordination**, **coherence**, and **partnerships** for a sustainable global geodetic reference frame; raising **awareness** and **advocating** for global geodesy **capacity** and **education**; and developing relevant **communications**.

Next Steps toward a Global Geodesy Needs Assessment

Listening to our global community, building on what we have learned

2021 SCoG Geodetic Reference Frame Competency Survey: Building on 2018's Initial Goal

Implement (Member States) self-assessment of their competency creating, maintaining and improving their national reference frames

ETCB WG updated the 2021 Survey

To better understand *regional* '**Geodetic Capacity Development**' needs

What competencies are already possessed?

What will needed for the future?

Invitation sent to all UN-GGIM Regions in June 2021

Motivation for 2021 Survey and Who-How-Why they should respond

Deadline end of Feb 2022

Next Steps toward a Global Geodesy Needs Assessment

Listening to our global community, building on what we have learned

Survey 2021 – Preliminary Results I

- Increased responses and details
- Deeper insights into the current competencies, qualifications and skill sets of the respondents

Global Reference Frame Competency SURVEY	2018	2021
Number of Questions	28	66
Number of Responses	98	207



Next Steps toward a Global Geodesy Needs Assessment

Listening to our global community, building on what we have learned

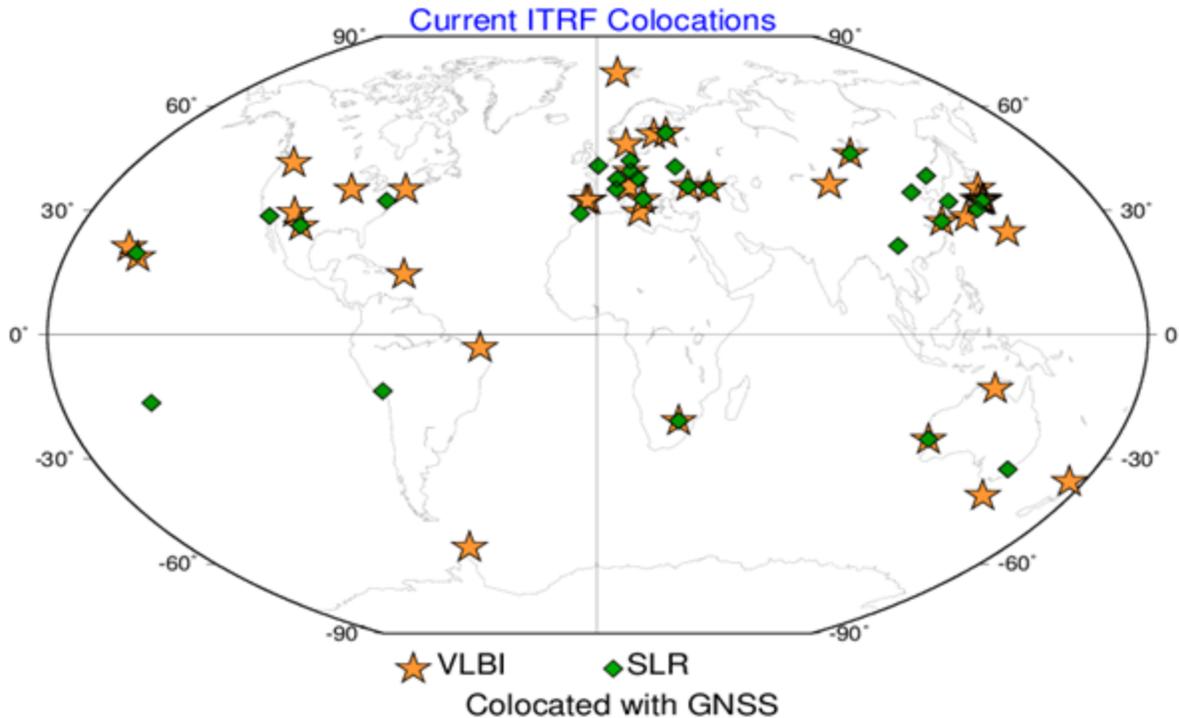
Survey 2021 – Preliminary Results

- Continued agreement with 2018 Survey => **Clear need for a sustained GGRF**
- Ongoing Challenges
 - Building Capacity
 - Maintaining Capability
 - Resources (Human, Fiscal, Political Support)
- Clear need of developing nations to receive assistance ETCB / knowledge transfer from developed nations, facilitated by a coordinating body
- Capacity & Education should be an integral part of an IGIF-based Country Action/Development Plan
- Findings & Results will be shared with SCoG in support of their Strategy for ensuring GGRF sustainability
- Expectations that the GGCE can facilitate and further action some findings

Next Steps toward a Global Geodesy Needs Assessment

Listening to our global community, building on what we have learned

2019 IAG Geodetic Infrastructure Survey



- Comprehensive survey administered by the International Association of Geodesy, in collaboration with the SCoG
- Respondents included all IAG technical services
- Outcomes included identifying the need for 20 SLR and VLBI instruments needed to fill critical gaps in the GGRF, as well as the need for 4 additional Data Centers and 6 additional Analysis Centers.
- Survey also indicated the need for substantial investment in new technology development.

Next Steps toward a Global Geodesy Needs Assessment

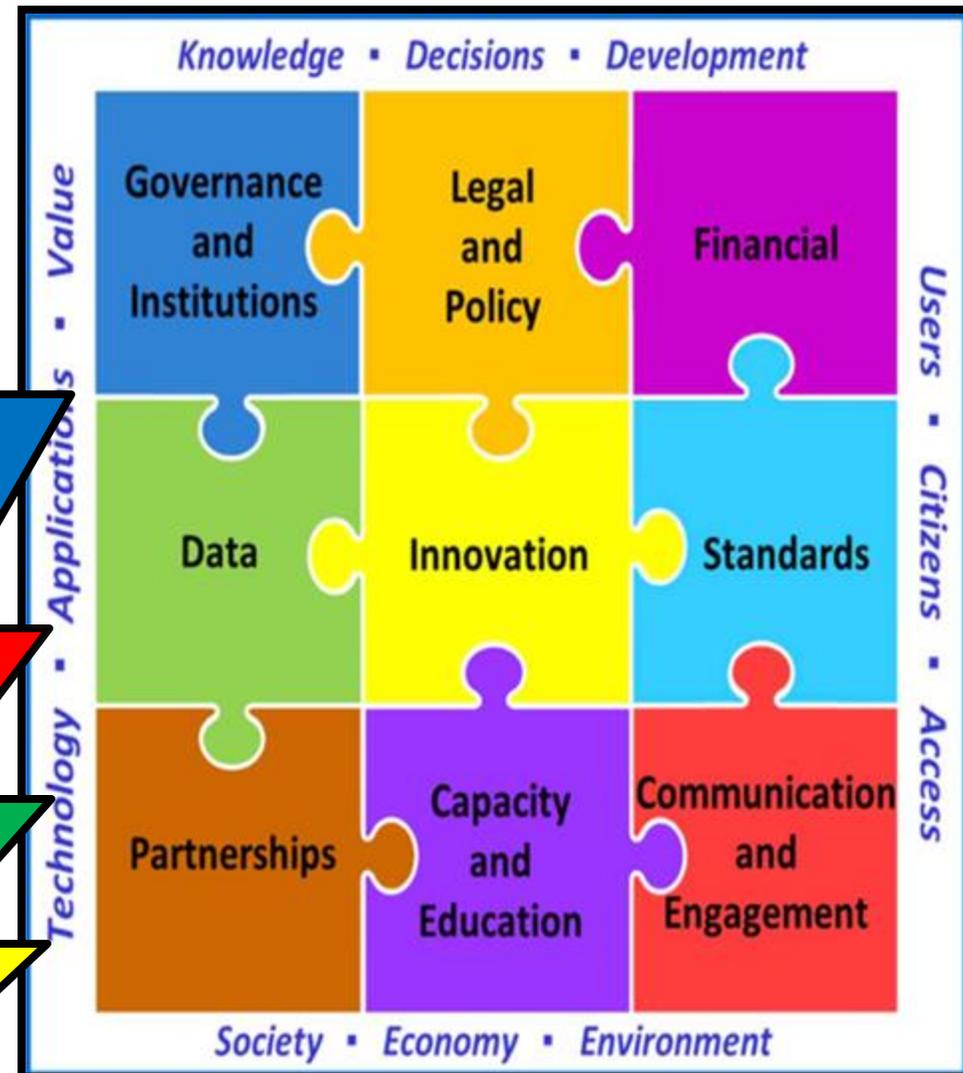
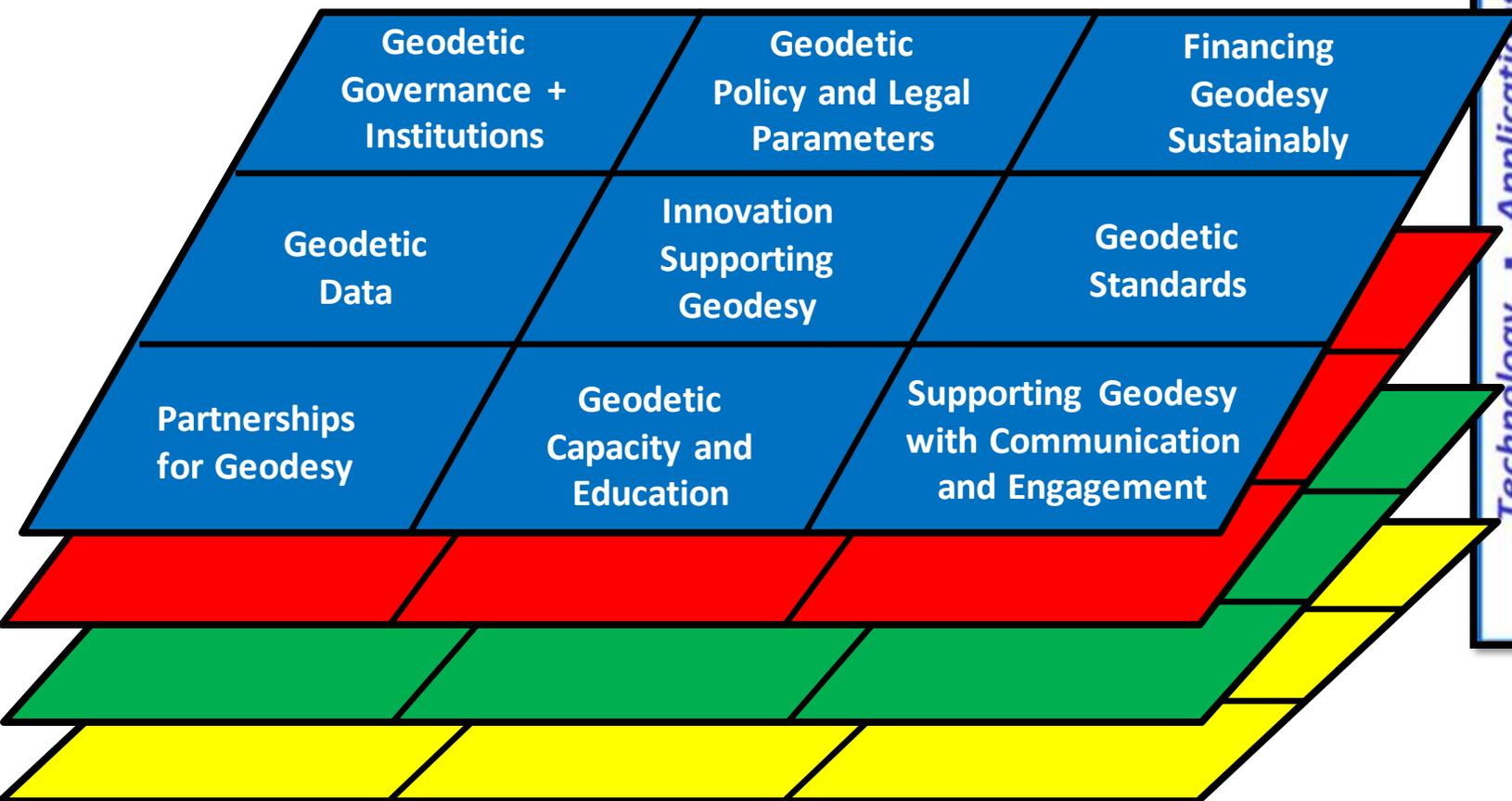
Listening to our global community, building on what we have learned

Architecting a Global Geodesy Needs Assessment: Initial Tasks and Questions

- Stakeholder identification and mapping
 - How are these stakeholders affected by a sustainable GGRF?
 - How could a stakeholder affect adoption of geodetic infrastructure, skills, and capacity in their region?
 - What aspects of the GGRF does each stakeholder care most about?
 - How are stakeholders in the GGRF inter-related? How do they connect and share geodetic infrastructure and capacity?
- Identify areas of stakeholder needs and gaps to accessing and utilizing the GGRF
 - Where do these needs and gaps take place?
 - Who is impacted by these needs and gaps, and how?
 - What are some causes or shortcomings that contribute to these needs and gaps?
 - What policy solutions are already in place to address these needs and gaps? How can the Subcommittee fully leverage these existing resources?
- Identify policy solutions built on established practices, such as the Theory of Change

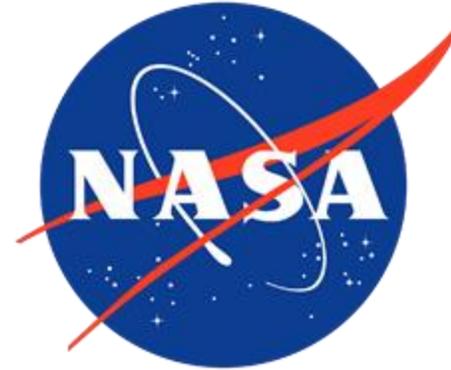
7 Strategic Actions for the GGRF:

Forming the foundation for an
IGIF Operational Framework for Geodesy



Partnerships and Organizational Synergies

Going far, together.



Representatives from partner organisations are invited to join Subcommittee on Geodesy meetings and events to contribute their experience and expertise.

The Subcommittee strongly believes in being inclusive and welcomes the opportunity to work with other organisations also striving to sustain the GGRF.

A photograph of Earth from space, showing the curvature of the planet and the atmosphere. The top half of the image shows the bright blue and white atmosphere against the blackness of space. The bottom half shows the dark surface of the Earth, with numerous small, bright yellow and white lights representing cities and urban areas at night. The text "Thank You!" is centered in the middle of the image.

Thank You!



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Panel discussion lead by Anne Jørgensen



**Dr Diane Dumashie, FRICS
FIG President**

**Partnership:
UN GGIM Global Geodesy Forum**

**Tackling the Global Challenges:
People and Partnerships**

**UN GGIM 13, New York, USA
31st July 2023**



Our Profession: Serving People and Planet



It is all about People!

- **The 2030 Agenda:** agreed and united global policy to transform the social, economic and environmental dimensions of humanity and our planet
- **Context of considerable global challenges**
 - **Why Partnerships matter**

From Measurement to Action



• Jack Dangermond ESRI CEO ESRI UC, July 2023

Overview



- 1. FIG: Who What and Why**
- 2. Shaping the Future: How**
- 3. Partnerships: What and Who**
- 4. Final Words**

Overview



1. FIG: Who What and Why

2. Shaping the Future: How

3. Partnerships: What and Who

4. Final Words

1. Who and What: International Federation of Surveyors

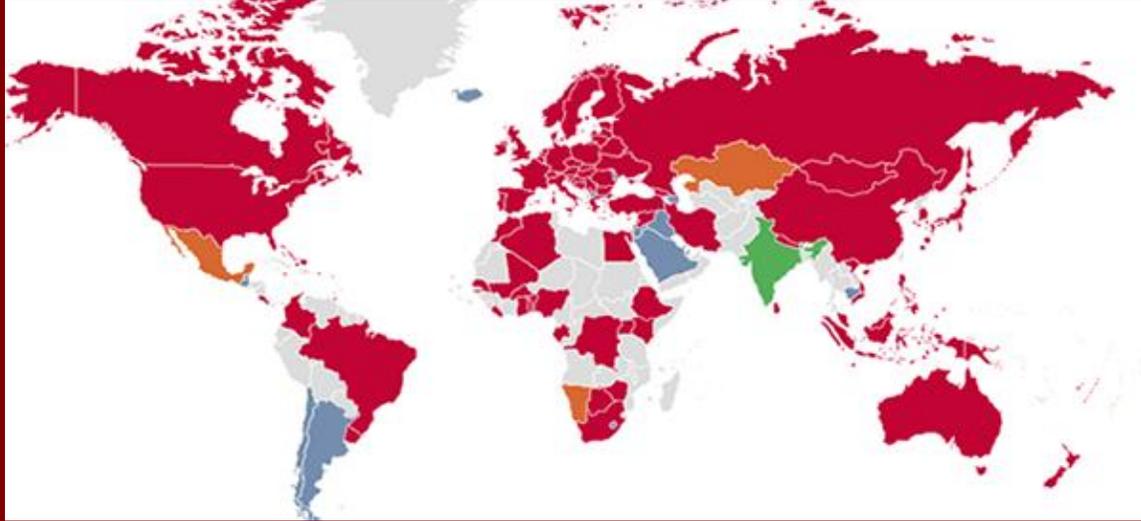


FIG:

- Members organisation, (100 + countries)
- FIG Contribution: knowledge generation, outreach and capacity building
 - **Professional: Standards**
 - **Institutional: Build capacity**
 - **Global Development: Regional/ International**



How: Depth of experience Survey and Geospatial

Activity and outputs with Commissions:



1. Professional standards & practice

2. Professional Education

3. Spatial information management

4. Hydrography

5. Positioning and measurement

6. Engineering surveys

7. Land management & cadastre

8. Spatial planning and economic development

9. Valuation and real estate

10. Construction economics

and, **FIG** Networks, Permanent Inst



'Tackling the Global Challenges'

FIG action orientated theme



Prof Gratton:
www.lyndagrattton.com

Five Forces:

- **Climate action** and the needs of a low carbon economy / also Energy and resources
- Rapid advances in **Technology and digital revolution**
- **Globalisation and communication**
- **(Settlements and (Rapid) urbanisation)**

Society's needs (and benefits):

- Transformational **societal** changes and expectations
- Profound changes in longevity and **demography**

The Next Decade: Act on the Trends

The SDGs
were the crowning
global achievement of 2015 and 2030 is close;
but survey professionals deal in global and local
realities.

Are we still relevant?

Yes, with Purposeful and Continuing intent; but.....

It is all about People!



www.pexels.com/ Eberhard Grossgasteiger

What does relevance look like?

We

- Are relevant to society for Their/ Society benefit
- Bridge the gap between high level strategy/ policy and actions on the ground
- Are recognised as a profession that is trusted, with high ethics and standards (keep building our capacity)

And

- Lead and contribute to sustainable development

Overview



1. FIG: Who What and Why

2. Shaping the Future: How

3. Partnerships: What and Who

4. Final Words

2. How:

The Future We want to shape

Our work plan aims to deliver and
Demonstrate our resolve

Vision:

- **Serving Society, benefitting people and the planet**



Graphic UN HABITAT

Theme:

- **Tackling the Global Challenges** (Trends and crisis)
- Continue to develop capacity and grow to ensure that as individuals and a federation of members we remain relevant and capable of benefiting people and the planet

Work Plan Aims and Pillars



FIG Aims:

- Planet
- People
- Partnership
- Governance and Communication

Sustainability runs throughout our work

- Task Forces are our Pillars and focussed to unpack our Relevance & Societal benefit
- FIG Commissions and FIG community working together achieves our Theme

Above all,

FIG works in Partnership

Pillar i: Planet



Sustainability aim is making sure:

- We make the best use of land and marine resources, and
- Our cities and settlements are resilient and adaptive
- Play a more prominent role in the climate agenda

TF: 2030 Agenda & SDG's,

Chair: Paula Dijkstra

TF: Climate Compass,

Co Chairs: Roshni Sharma & Clarissa Augustinus

Pillar ii: People



- Sustainability is about making sure we demonstrate Equity, Diversity & Inclusion, leaving no one behind in our profession.....
- And build and maintaining our professional competence to ensure societal relevance

TF: Role in Trends and Geospatial Information Ecosystems

Chair: Abbas Rajabfard

TF: Evolutionary Diversity and inclusion in the Surveying Profession

- Chair: Stephen Djaba

FIG Working Weeks;

Pillars & Partners Build on Pillars



- 2023 Orlando – Sustainability & Climate
 - Protecting our world Conquering New Frontiers
- **2024 Accra – Planet & Resources**
 - Building resilient environment
- 2025 Brisbane – Geospatial/ People
 - Collaboration, Innovation and Resilience: Championing a Digital Generation

And.....,

- Congress - 2026 Cape Town

Overview



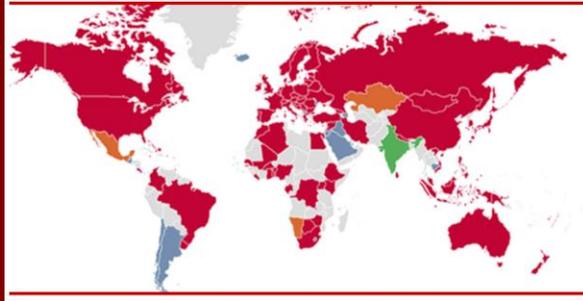
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3. Pillar iii: Partnerships



Sustainability is about making sure that both internal and external partnerships are working effectively and cultivating stronger engagement



Our relationships;

- Effective (All) member engagement
- Building and working for mutual benefit with external partners, and
- Providing Institutional capacity development

And, with UN GGIM.....

UN GGIM & FIG People



UN-GGIM: Geospatial Societies

UNITED NATIONS COMMITTEE OF EXPERTS ON
GLOBAL GEOSPATIAL INFORMATION MANAGEMENT

UN GGIM

- Observer status
- Geospatial Societies (GS)
- Working Groups (LAM, Geodesy, DM + input Hydro)
- Regional working (Africa, Asia Pacific & Americas)

And.....

- Partner UN GGIM Subcommittee on Geodesy

FIG Partnership: Subcommittee on Geodesy



- Ryan Keenan, FIG Comm chair, Positioning and Measurement
- FIG Representative Subcommittee on Geodesy

And

- FIG 2024 special session Africa GRF
- Centres of Excellence



Overview



1. FIG: Who What and Why

2. Shaping the Future: How

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4. Final Words

4. Tackling the Global Challenges



It is all about People!

Relevance requires a **Purposeful** and continuing intent to implement:

- Looking to societal contributions
- Looking to our people and profession
- Can only be done in **Partnerships.....**

Serving People and Planet 2030 and Beyond



Tackling the Global Challenges

- Faced with the magnitude of change in our World, on our Planet:
- - We can strengthen the use of geospatial information in all its forms
- If
- We do the very best we can over the coming decades

**Our professional relevance to
society, is in our collective,
partnership hands**

Our Journey is far reaching!



Thank You

- www.fig.net
 - President
- FIG: Dr D Dumashie
- ddd@dumashie.co.uk





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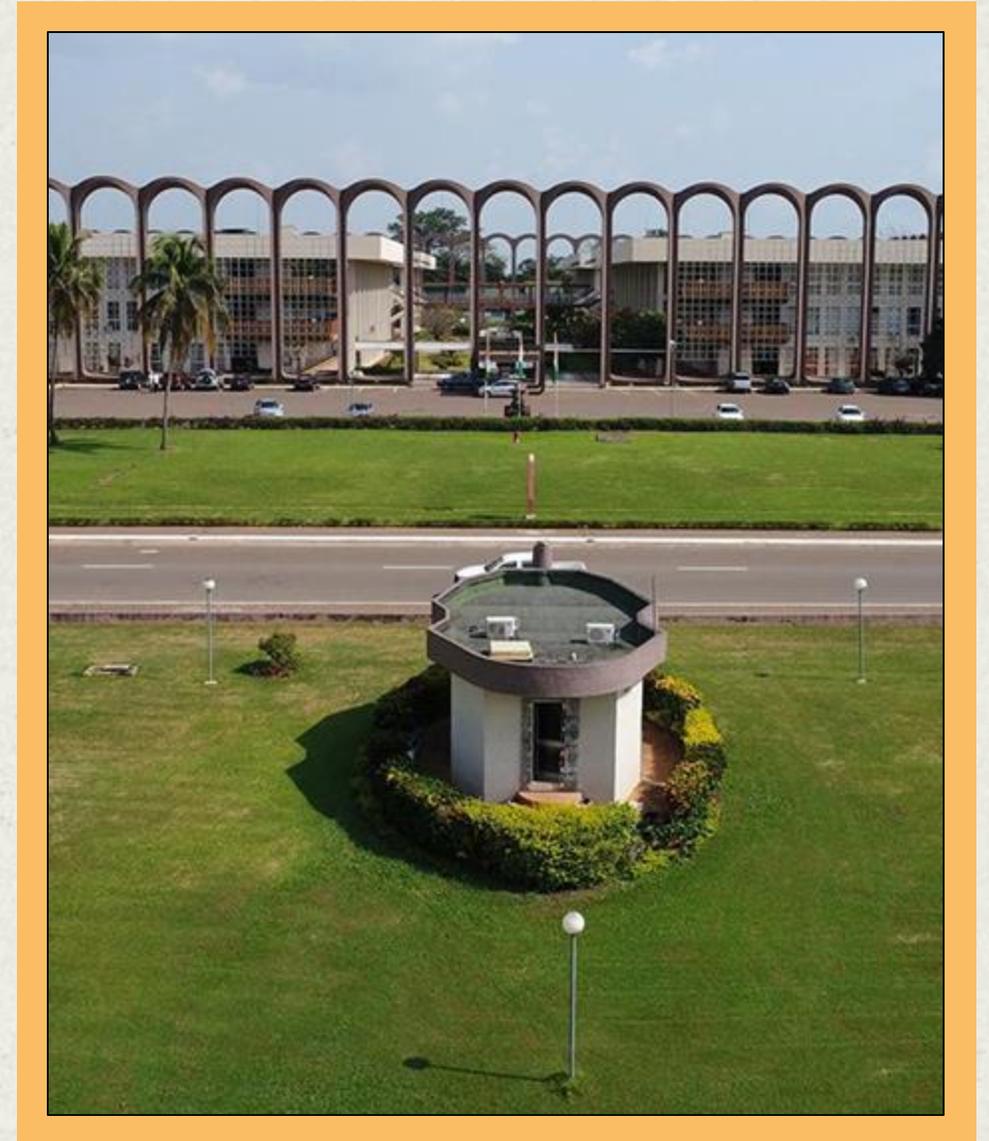
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Towards a Sustainable Global Geodetic Reference Frame

Case Study: Africa



IGS YKRO (*Cote d'Ivoire*)

PRESENTERS

Fernand BALE



Co-chair UN-GGIM/SCoG
fbale@bnetd.ci

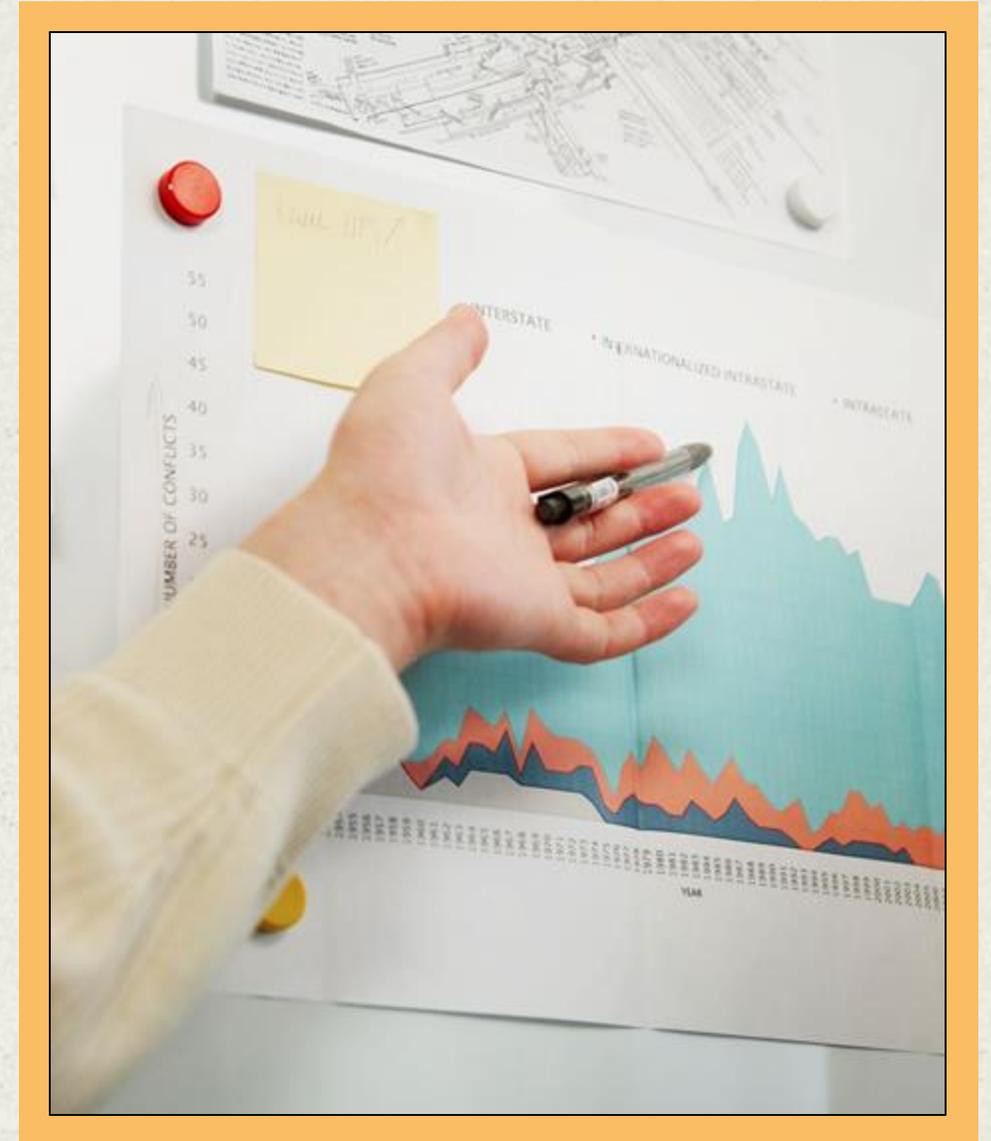
Dr Ryan KEENAN



Chair, FIG Commission 5 - Positioning & Measurement
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AGENDA

- Introduction
- Key Challenges in Africa
- Some Initiatives
 - Experiences from Cote d'Ivoire
 - JIGSAW - engaging CORS in Africa
- Recommendations



INTRODUCTION

In February 2015, the United Nations (UN) General Assembly adopted the resolution “A Global Geodetic Reference Frame for Sustainable Development” – the first resolution recognizing the importance of a globally-coordinated and supported approach to geodesy, involving all UN Member States.

Accordingly, the UN Global Geospatial Information Management (GGIM) Subcommittee on Geodesy (SCoG) is working towards developing an accurate and sustainable Global Geodetic Reference Frame (GGRF).

The question is where is Africa in that journey? What are our challenges? What initiatives are going on and the way forward ?

We will try to answer these questions and then open the discussion to shape a way to go together towards a sustainable GGRF.

This presentation is based on our experiences, WG ETCB’s surveys held in 2018 and 2021 on Reference Frame Competency, and FIG Commission 5’s Reference Frames in Practise workshops; with an emphasis on GNSS CORS infrastructure thanks to their prevalence, ease of installation (relative to other sensors) and community benefit..

KEY CHALLENGES

01.

THERE ARE THREE IMPORTANT CHALLENGES



Advocacy

Advocacy of geodesy and its benefits to stakeholders and community in order to gain their support.



Capacity Building

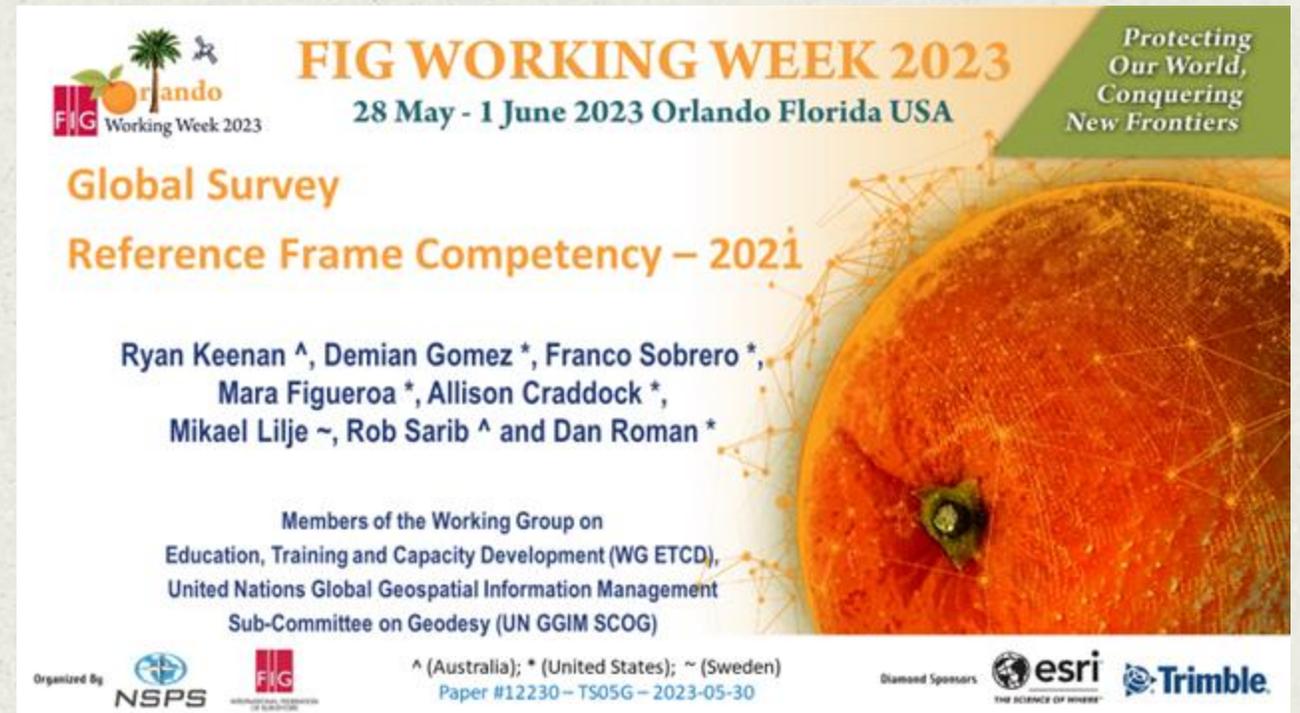
There is a lack of people with sufficient knowledge, qualifications and skills in geodesy, obviously due to a lack of training institutions in that field in Africa.



International Collaboration

To mobilize resources to assist African countries in establishing and maintaining sustainable geodetic infrastructures and systems. Embrace the opportunity to share experiences and discuss ideas with experts from around the World.

Global Survey of Reference Frame Competency 2021



The poster features a large orange with a network of orange nodes and lines overlaid on its surface. The text is arranged in a structured layout with various logos and a green banner in the top right corner.

FIG Working Week 2023
Orlando Florida USA
28 May - 1 June 2023

Protecting Our World, Conquering New Frontiers

Global Survey Reference Frame Competency – 2021

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Organized By  

[^] (Australia); ^{*} (United States); [~] (Sweden)
Paper #12230 – TS05G – 2023-05-30

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Self-Assessment of RFC as initiated by ETCB-WG

GRFC Survey 2021



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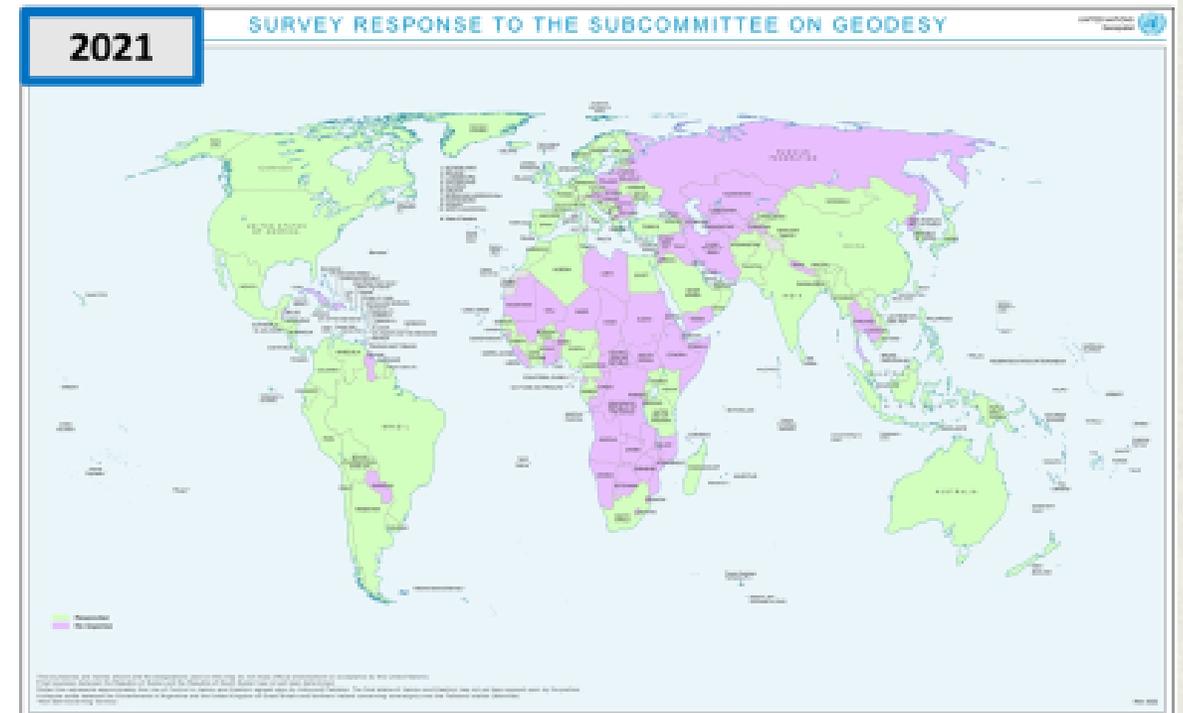
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Survey 2021 – Preliminary Results I

- Increased responses and details

GRFC SURVEY	2018	2021
No. of Questions	28	66
No. of Responses	98	207
No. of Member States	65	101

- Deeper insights into the current competencies, qualifications and skill sets of the respondents



GRFC Survey 2021



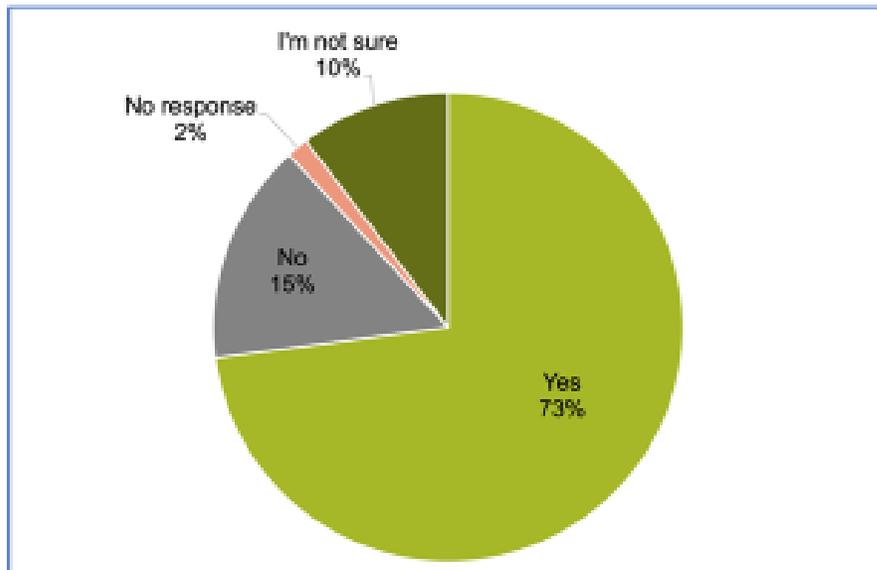
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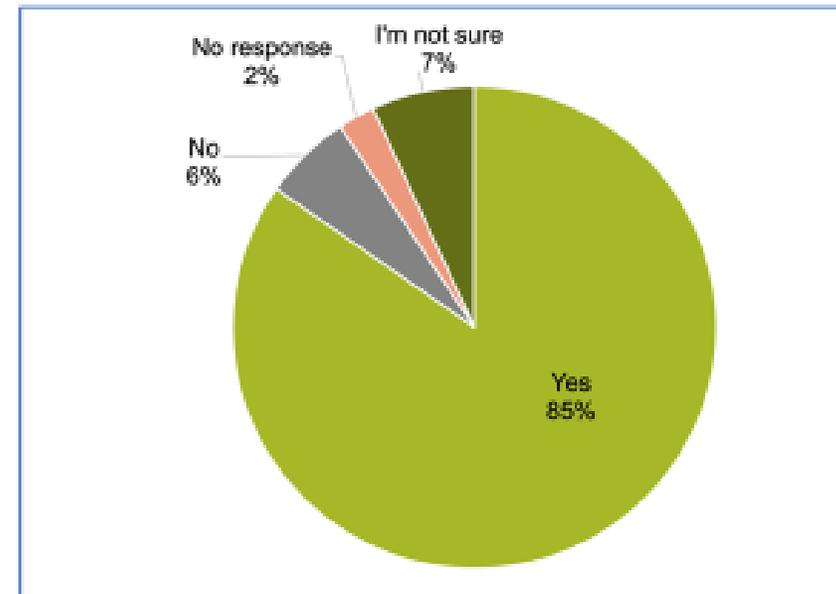
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Survey 2021 – Preliminary Results II – Reference Frames

- Geocentric Reference Frame on ITRF?



- National Vertical Reference Frame?



GRFC Survey 2021

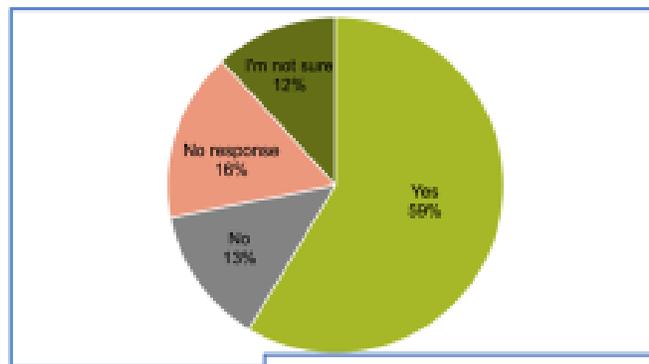


FIG WORKING WEEK 2023

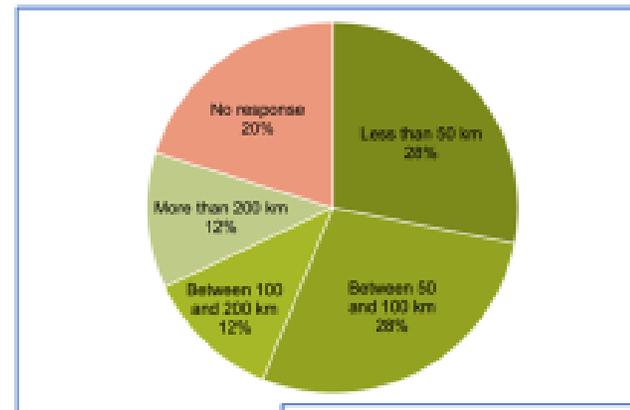
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Survey 2021 – Preliminary Results III – CORS Infrastructure

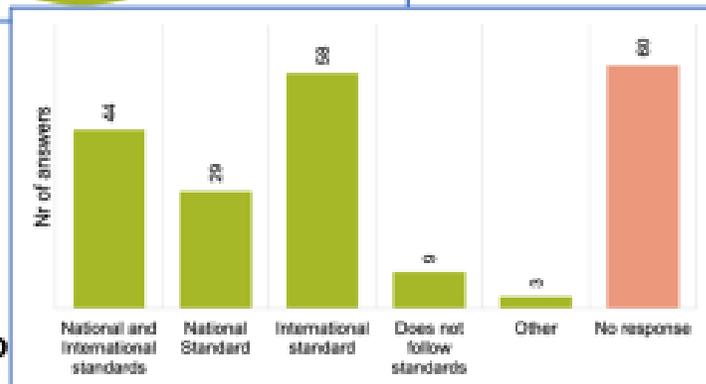


CORS Presence?

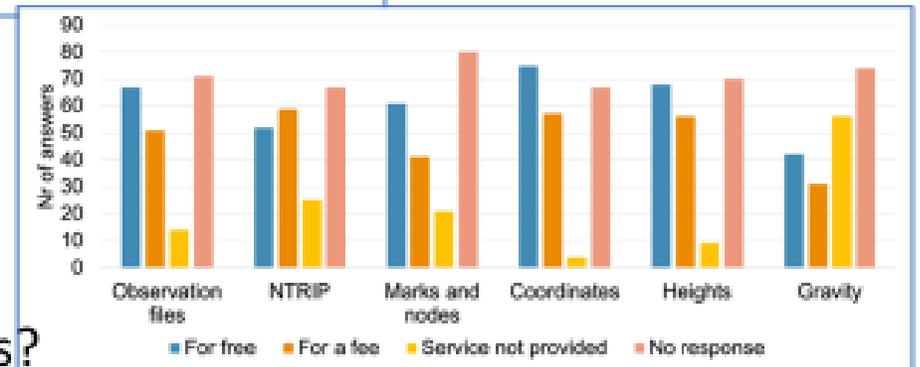


CORS Spacing?

CORS Standards?



CORS Services?



GRFC Survey 2021



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Survey 2021 – Major Findings

- Continued agreement with 2018 Survey => **Clear need for a sustained GGRF**
- Ongoing Challenges
 - Building Capacity
 - Maintaining Capability
 - Resources (Human, Fiscal, Political Support)
- Clear need of developing nations to receive assistance ETCB / knowledge transfer from developed nations, facilitated by a Coordinating body
- CC (Capacity & Capability) should be an integral part of a CADP (Country Action Development Plan)

GRFC Survey 2021



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Next Steps

- Findings & Results will be shared with SCoG in support of their Strategy for ensuring GGRF sustainability
- Expectations that the GGCE can facilitate and further action some findings
- Final Report expected in 2024 Q1
 - ?Presentation to UN SCoG 2024?
 - ?Presentation at FIG WW 2024 Accra?

**Ultimately 'making Geodetic Capacity Development' FAIR
(findable, accessible, interoperable and reusable)**

SOME EXAMPLES

02.

EXPERIENCE FROM CI



In Cote d'Ivoire we are taking advantage of the implementation of the Land Policy to modernize the national geodetic network. Why ?

The rural land domain is estimated at 23,000,000 ha, while around 300,000 ha have land titles (August 2022). The challenge is that, the Government decided to achieve that program in 10 years.

Let's assume that the project covers 500 000 ha per year, the work will take 46 years; and at a rate of 250,000 ha per year, it would take 92 years to complete the work. And currently we are at a rate of 5~6000 ha per year.

We saw the opportunity to advocate for a modern, accurate and reliable geodetic network that will improve surveying. That's how the first national CORS network came to life in Côte d'Ivoire thanks to AFOR.

AFOR is the National Rural Land Agency in Côte d'Ivoire. With the support of the World Bank, it agreed to fund the establishment of that CORS network in two phases :

2021 – 2022 (~\$1,5M):

- State of the national geodetic network;

- Reconstruction of damaged pillars ;

- Establishment a CORS network (5 stations) ;

- GNSS observations and calculation of new coordinates of the 1st order (43 points) and a third of the 2nd Order in ITRF 2014 (~ 200 points) previously in ITRF 96;

- Change management : training, sensitization, etc.

2024 – 2025 (budget in negotiation):

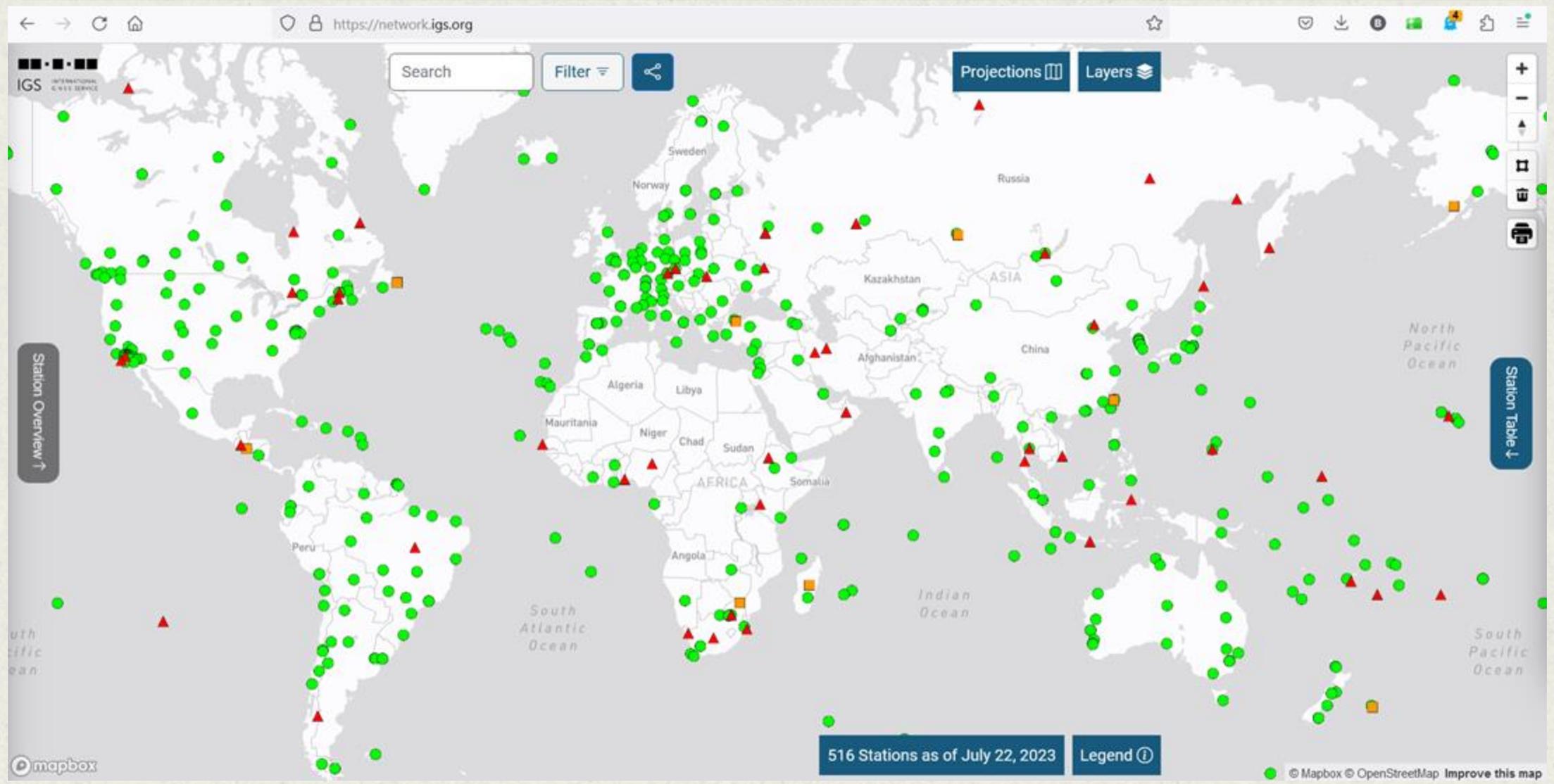
Add 16 more CORS stations and observe all the 2nd order

As an impact, this investment contributes to improving the quality of measurements, reducing the time of technical operations, and to the overall consistency of plans, thus avoiding overlaps and ambiguities that are sources of land disputes.



IGS NETWORK

<https://network.igs.org/>

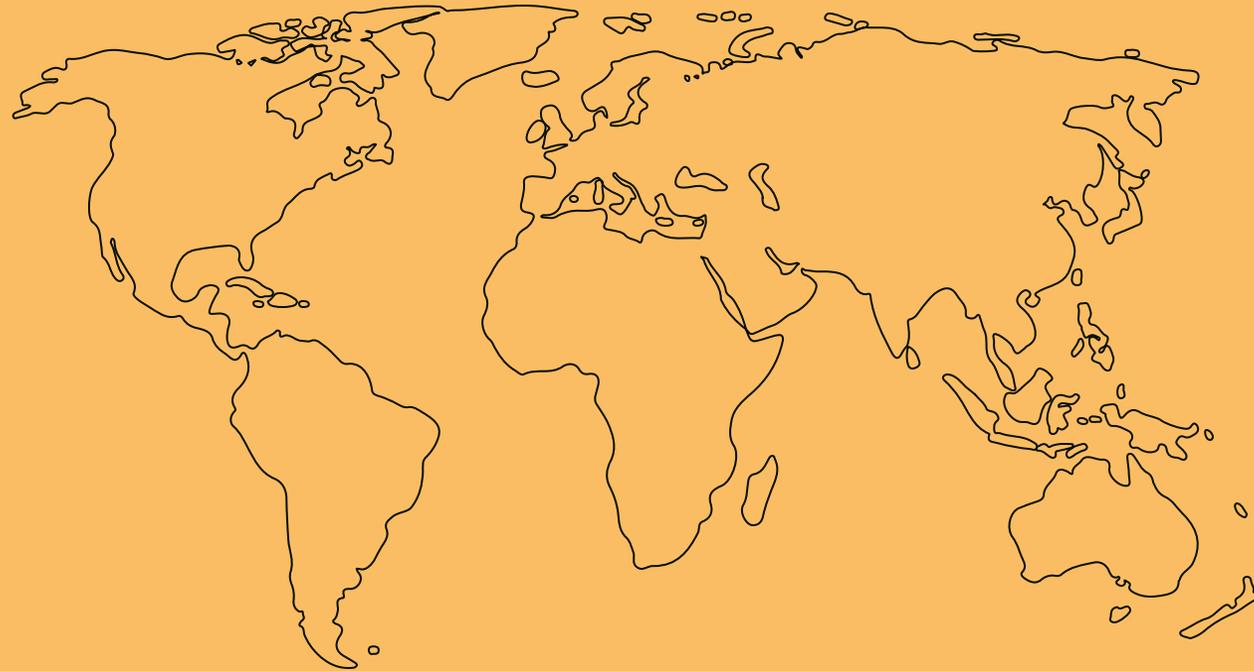


This map shows that around 5% of IGS stations are based in Africa (26/516), and there are no Analysis Centers within the region. We have 1 VLBI site based in South Africa; Our contribution to the GGRF can be improved..

Engaging CORS in Africa

- African is critical to supporting a sustainable GGRF for the region of Africa (AFREF) as demonstrated by a very low number of contributing GNSS CORS.
- Reports of many GNSS CORS across Africa, owned and operated by governments, universities, commercial organisations and associations, however little or no data evidence.
- There is limited measurement of capacity and capability
 - ‘You can’t know what you don’t measure’

RECOMMENDATIONS



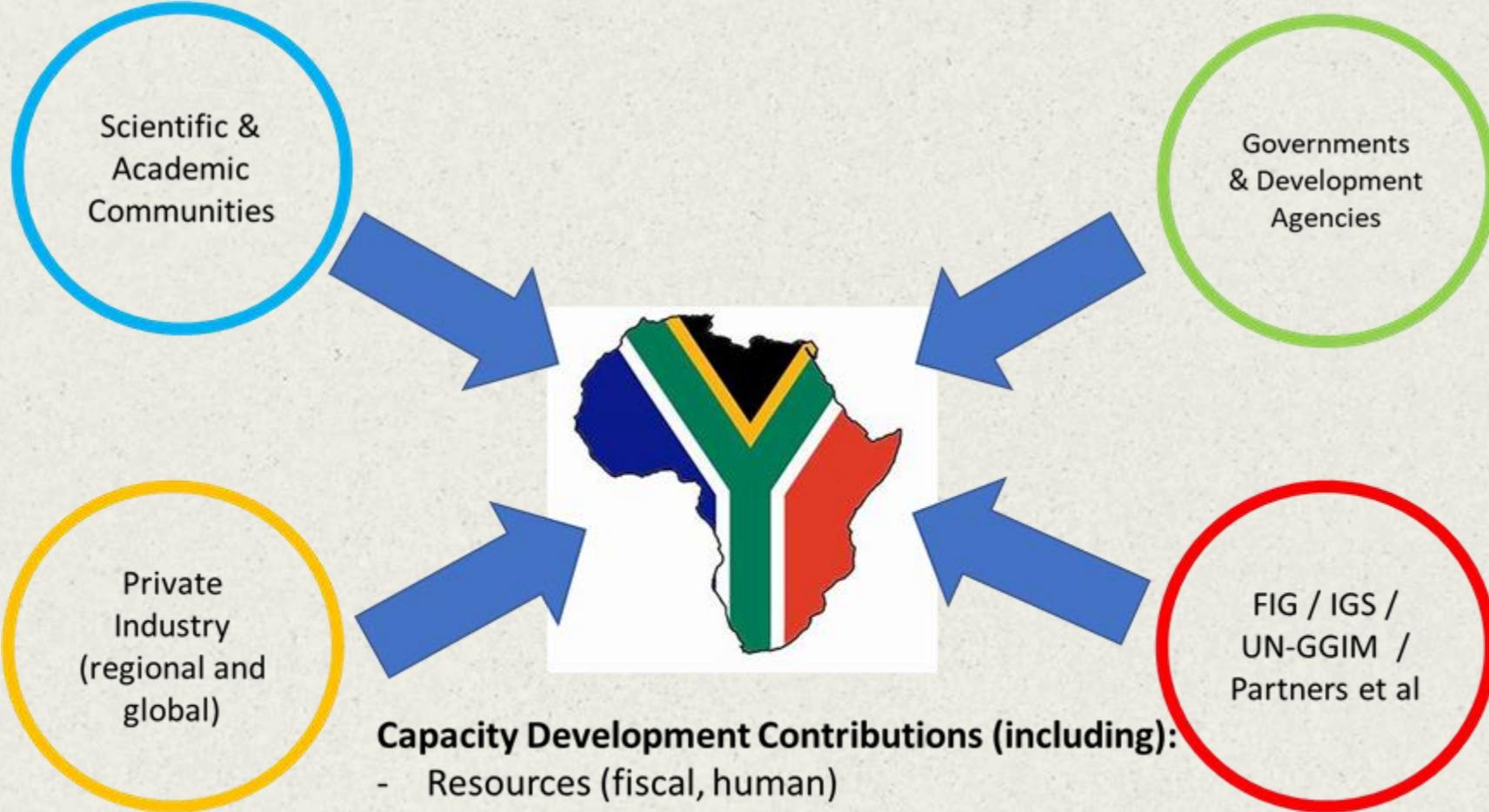
03.



GLOBAL COLLABORATION

JIGSAW – The African CORS Initiative

Joining IGS with the African World



Capacity Development Contributions (including):

- Resources (fiscal, human)
- Training Materials
- Equipment & Support
- Marketing & Outreach
- Networking



Commission 5



Commission 5

JIGSAW - A New CORS Portal

- **Portal will be a multi-lingual means to share:**
 - **Known CORS locations and metadata**
 - **Known operators**
 - **Visualise the locations where GNSS surveying and positioning could be done**
 - **Visualise the locations for development**
 - **Authorities and Public will be aware of operational GNSS services and have access to metadata about accessing these CORS**
 - **Portal will NOT provide data sets or live services**
-

JIGSAW - Goals and Benefits

Goals

- Raise awareness of operational GNSS CORS (not provide data access to operational CORS)
- Highlight gaps in coverage for stakeholders
- Identify target areas for development, support, funding (will not directly fund)
- Support regional initiatives for GNSS CORS (not apply for funding)
- GNSS CORS owners/operators will proactively register and maintain their sites on the portal
- Go far, go together

Contents

- Provide a sustained information portal for operational GNSS CORS in Africa (not other regions)
- Display locations and metadata about these sites (not display real-time / archived data availabilities)
- Inform interested parties of the correct CORS owners/operators to contact

Africa - Going Far, Together

- **Smart goals will facilitate greater collaboration and engagement, and possibly yield alternate sources of resources, in particular the private sector and independent experts who can provide technical assistance on the Continent.**
- **Take advantage of the JIGSAW Initiative to further strengthen partnerships and the contributions of developed countries to support developing countries at the global, regional and national level.**



THANKS!

DO YOU HAVE ANY QUESTIONS?

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FREILIGRATH
J. G. FICHTE
G. BÜCHNER







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“In these testing times, described by the UN secretary general as a red alert for humanity, geodesy has a key role to play.”

[His Excellency Ambassador Peter Thomson](#)

UN-GGIM Global Geodesy Ambassador and UNSG’s Special Envoy for the Ocean

