

# Geodetic Capacity Development

UN Subcommittee on Geodesy  
Working Group on Education, Training and Capacity Development

Dr. Daniel Roman, Chair



UN-GGIM

United Nations Secretariat  
Global Geospatial Information Management

[ggim.un.org](http://ggim.un.org)



## Reference Frame Competency Survey – 2018

- A summary of the results and findings from the 2018 Survey was published at FIG 2020 WW Amsterdam



- **“A Global Survey of Reference Frame Competency in terms of Education, Training and Capacity Building (ETCB): Results, Analysis and Update”**
  - Ryan Keenan (Australia), Allison Craddock (USA), Mikael Lilje (Sweden), Rob Sarib (Australia) and Demian Gomez (USA)

[https://www.fig.net/resources/proceedings/fig\\_proceedings/fig2020/papers/ts02g/TS02\\_G\\_keenan\\_craddock\\_et\\_al\\_10753.pdf](https://www.fig.net/resources/proceedings/fig_proceedings/fig2020/papers/ts02g/TS02_G_keenan_craddock_et_al_10753.pdf)





## Reference Frame Competency Survey – 2021

- A summary of the results and findings from the 2021 Survey was published at FIG 2023 WW Orlando



- **“A Global Survey of Reference Frame Competency in terms of Education, Training and Capacity Building (ETCB): Results, Analysis and Update’**
  - Ryan Keenan (Australia), Allison Craddock (USA), Mikael Lilje (Sweden), Robert Sarib (Australia) and Graeme Blick (New Zealand)

[https://www.fig.net/resources/proceedings/fig\\_proceedings/fig2023/papers/ts05g/TS05\\_G\\_keenan\\_craddock\\_et\\_al\\_12230.pdf](https://www.fig.net/resources/proceedings/fig_proceedings/fig2023/papers/ts05g/TS05_G_keenan_craddock_et_al_12230.pdf)





## Reference Frame Competency Survey – 2018

### Key Takeaways:

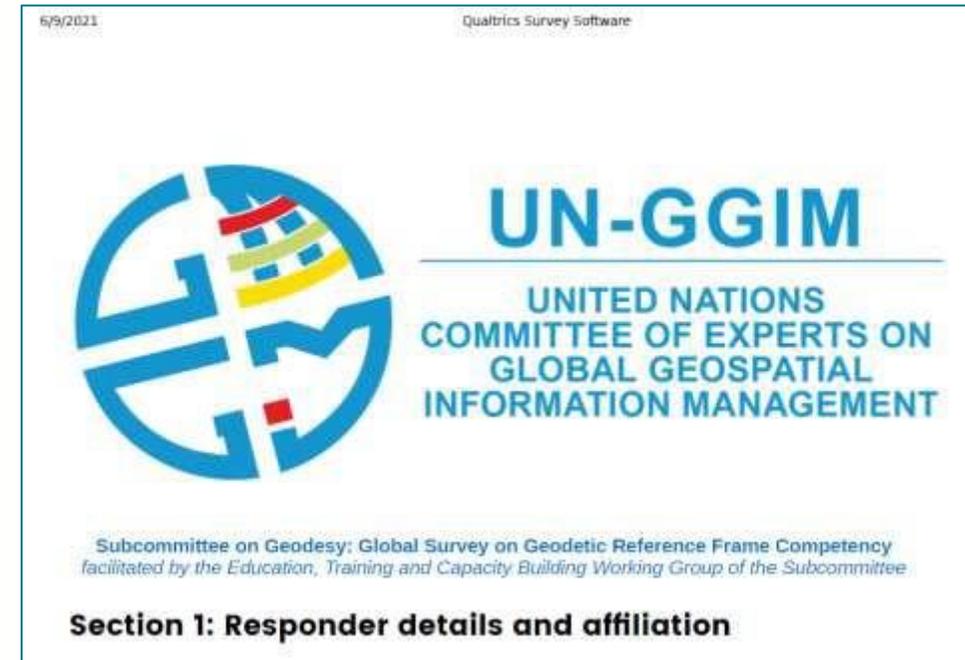
1. Majority aimed to **increase their competencies** by at least 1 level within the next 3 years
2. Very strong need for **continued ETCB contributions** from developed countries
3. Very strong support for a **global facilitator of all ETCB resources** (e.g. proposed GGCE)
4. **More insights needed** into the current (and target) competencies across the UN-GGIM Regions





## Reference Frame Competency Survey – 2021

- ETCB WG created an updated Survey
  - To better understand *regional* ‘**Geodetic Capacity Development**’ needs
  - What competencies are already possessed? What will needed for the future?
- Invite 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





## Survey 2021 – Preliminary Results I

- Increased responses and

RFC 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





## Survey 2018



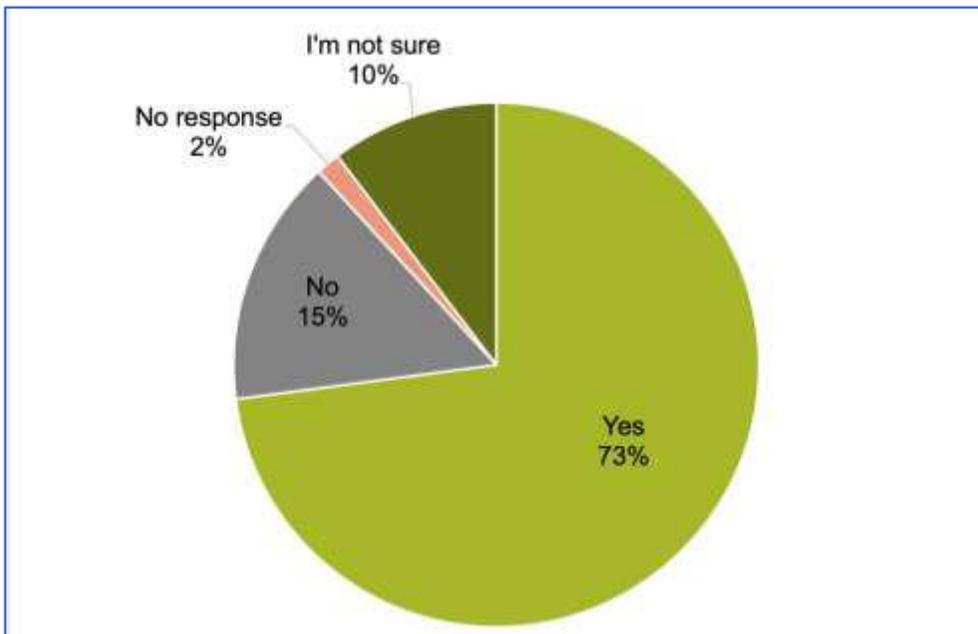
## Survey



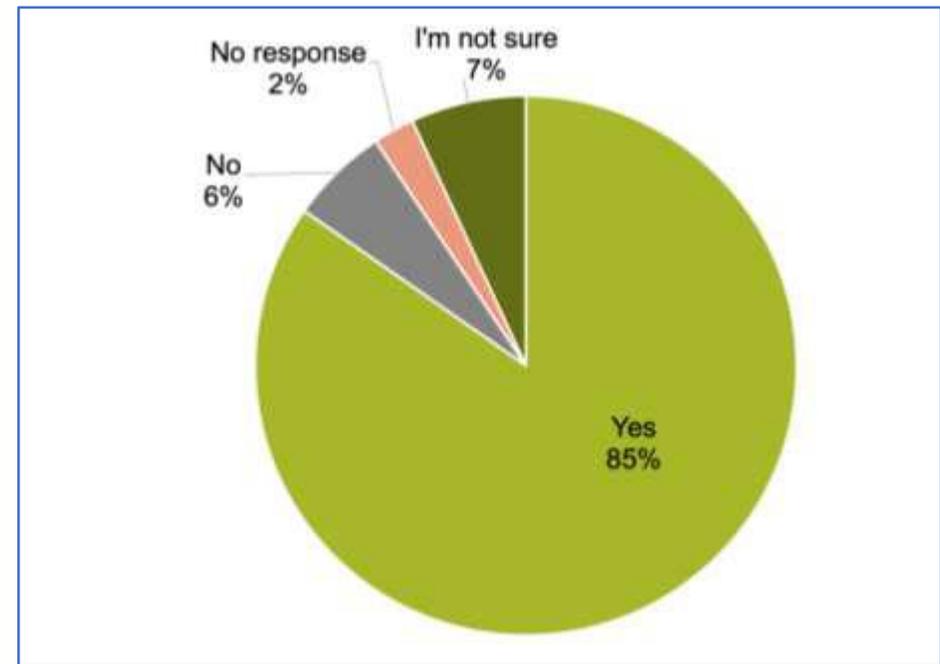


## Survey 2021 – Preliminary Results II – Reference Frames

- Geocentric Reference Frame on ITRF?

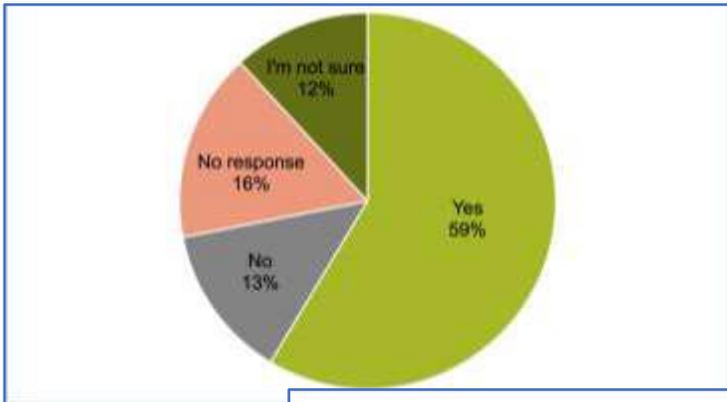


- National Vertical Reference Frame?

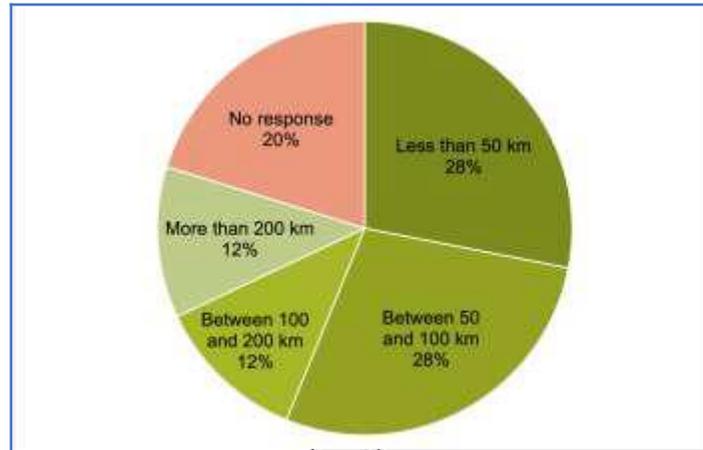




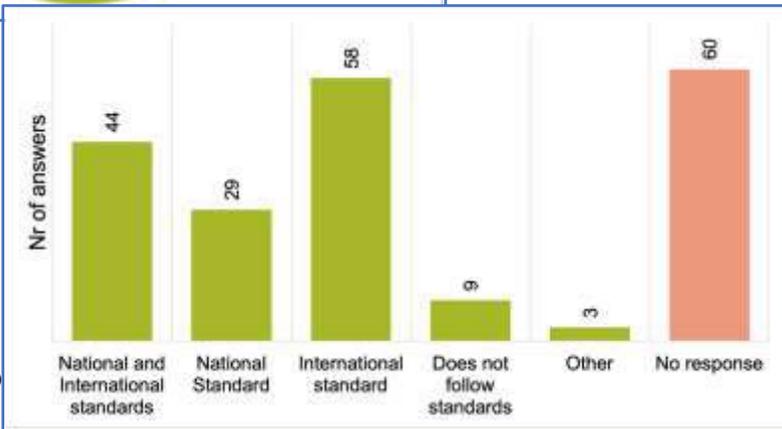
# Survey 2021 – Preliminary Results III – CORS Infrastructure



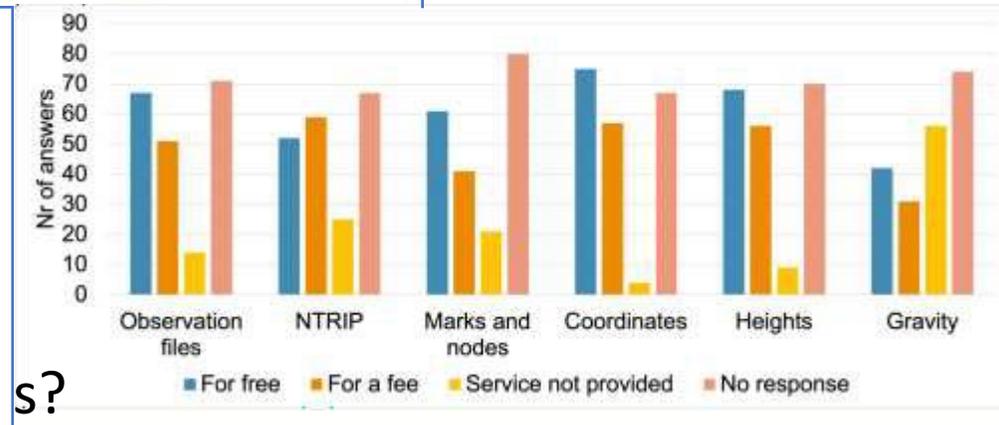
CORS Presence?



CORS Spacing?



CORS Standards?



CORS Services?





## Survey 2021 – Major Findings

- Continued agreement with 2018 Survey
- Clear need for sustained GGRF
- Challenges in maintaining capability and capacity, resources (human & fiscal)
- Clear need of developing nations to receive assistance ETCB / knowledge transfer from Developed nations
- CC (Capacity & Capability) should be part of a CADP (Country Action Development Plan)





## Next Steps for These Analyses ... and Beyond

- 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)**

- While these analyses will continue, new factors are changing roles and activities ...





## UN Global Geodetic Centre of Excellence (UN GGCE)

- Overarching goal
  - to assist Member States & geodetic organizations
  - to coordinate and collaborate
  - to sustain, enhance, access & utilize an accurate, accessible and sustainable GGRF
  - to support science, society & global development
- The objective is to support, within available resources, the implementation of General Assembly resolution 69/266 (UN GGRF)
- Strengthening and advancing:
  - Global geodetic cooperation and coordination;
  - Worldwide geodetic infrastructure;
  - Standards and policies;
  - Education, training and capacity development;
  - Communication and awareness.

United Nations » Department of Economic and Social Affairs » Statistics Division

Statistics Division

TOPICS ▾

DATA ▾

METHODOLOGY ▾

EVENTS ▾



United Nations Global Geodetic Centre of Excellence > UN Campus in Bonn, Germany



United Nations Global Geodetic Centre of Excellence

UN Campus in Bonn, Germany

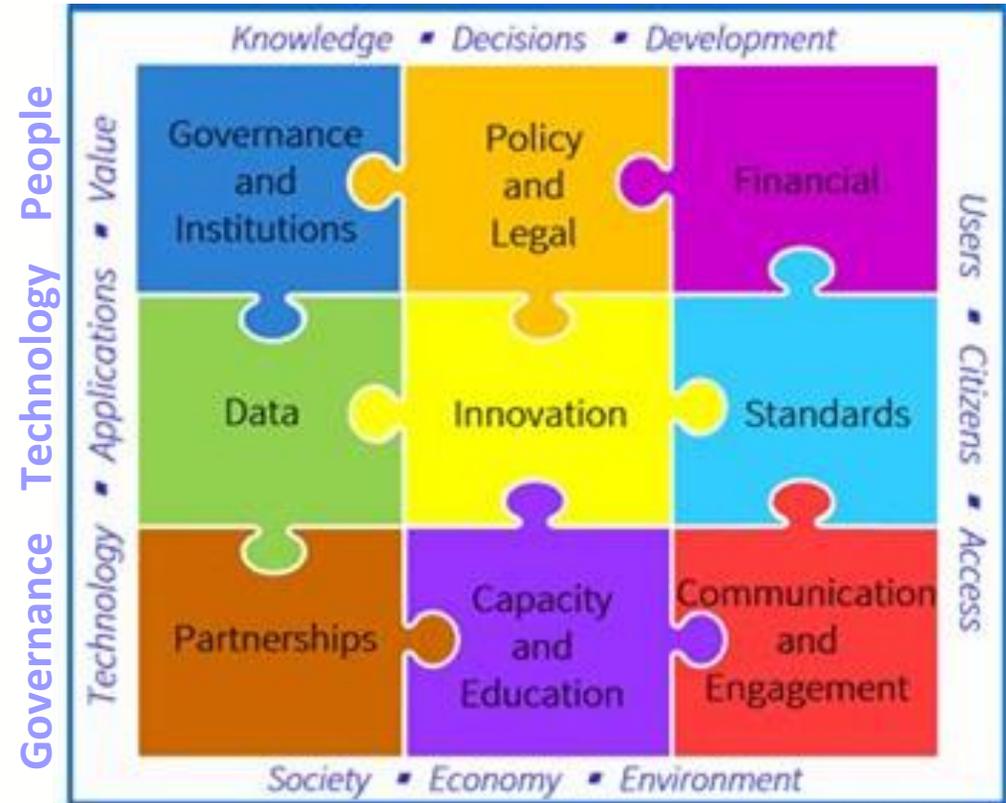
Source: Adobe Stock | johannes86





## UN SCoG WG Actions – Joint with IAG and FIG

1. **Global Geodesy Needs Assessment**  
Global/regional needs vs IGIF Strategic Pathways
2. **State of Geodesy Report**  
Geodesy contributions at global/regional
3. Support the UN GGCE  
Global Geodesy Development Plan
4. **Support and promote sustainable GGRF**  
Global coordination, coherence, and partnerships
5. **Raise awareness & advocate for global geodesy**
6. **Engage in capacity & capability development**
7. **Develop branding and communicate**





# UN SCoG - Global to Regional Relationships

- Coordinates globally with UN GGIM, IAG, FIG, ISO, OGC, GEO, etc.  
Overlapping mission areas – need to examine what is missed
- Works with regional Geodetic Reference Frame working groups
  - GRFA in UN GGIM Americas, GRF in AP region
- Works with regional bodies focused on geodesy
  - APREF, SIRGAS, NAREF, AFREF, etc.
- Part of governance mandate to coordinate efforts and minimize overlap of support to maximize capacity development
- Surveys to national reps on geodetic infrastructure, training, education needs
- Will coordinate work with GGCE, which will maintain operational picture





## Acknowledgements | Questions | Contacts

- The authors acknowledge:
  - Respondents for their time, constructive feedback and contribution to the survey
  - All groups involved with UN-GGIM SCoG and GGCE working to realise the vision of a sustainable and reliable GGRF.
- Contacts:
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