Report of UN-GGIM-AP WG1 - Geodetic Reference Frame

Meeting of Working Group 1:
Geodetic Reference Frame
November 3, 2020
UN-GGIM-AP Working Group 1
- Geodetic reference frame -

Chair
Mr. Basara Miyahara, Japan

Vice Chairs
Dr. John Dawson, Australia
Dr. Yamin Dang, China
Mr. Shyam Veer Singh, India
Dr. Mohd Yunus Bin Mohd Yusoff, Malaysia
Ms. Dalkhaa Munkhtsetse, Mongolia
Mr. Graeme Blick, New Zealand
Dr. Sangoh Yi, Republic of Korea
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UN-GGIM Geodesy

Regional Reference Frame (APREF, APRGP)

Regional Height System Unification

Regional Capacity Building

“Positioning geospatial information to address global challenges”
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2018 - 2021

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UN-GGIM GGRF Subcommittee on Geodesy

- Established in August 2017
- Working on sustaining the Global Geodetic Reference Frame (GGRF)

- Co-chairs: Nick Brown (Australia) <- Gary Johnston
  Alexey Trifonov (Russia)

- Working Groups:
  - Geodetic Infrastructure (Zuheir Altamimi, France)
  - Policy, Standard and Convention (Nick Brown, Australia)
    <- Mike Cramer, Canada
  - Education, Training Capacity Building (Mikael Lilje, Sweden)
  - Outreach and Communication (Anne Jørgensen, Norway)
  - Governance (Laila Løvhøiden, Norway)
UN-GGIM GGRF Subcommittee on Geodesy

• The SCoG membership includes:
  – 42 voting members nominated by the regional UN-GGIM Executives, ensuring geographically distributed membership
  – Associate Members (non-voting) including IAG, FIG and other Member States not included in the 42 above
  – Observers (non-voting)

• Asia-Pacific members:
  Australia, China, Fiji, Islamic Republic of Iran, Japan, Kyrgyzstan, Malaysia, New Zealand, Philippines, and the Republic of Korea

• While these 10 counties are voting members, all other Asia Pacific Member States are invited and encouraged to participate in committee activities as associate members.
UN-GGIM GGRF Subcommittee on Geodesy

- The 1st meeting in Mexico City on November 2017.
- The 2nd meeting in China on November 2018.
- The 3rd meeting was held in virtual on June 18, 2020. (Originally planned in UK on April 2020)

- Discussion on SCoG report to UN-GGIM 10th session
  - Draft Position Paper on Sustaining the Global Geodetic Reference Frame
  - Draft Concept Paper on Establishing a Global Geodetic Centre of Excellence
UN-GGIM GGRF Subcommittee on Geodesy

Draft Concept Paper on Establishing a Global Geodetic Centre of Excellence (GGCE)

• GGCE was proposed by the SCoG as mechanism to enhance governance of sustainable GGRF in UN-GGIM 9th session in 2019.
• In 10th session, Germany proposed to establish the first GGCE at Bonn UN Campus in Germany.
• UN-GGIM request SCoG to have more consultations with the Member States and relevant geodetic stakeholders.
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Asia Pacific Reference Frame (APREF)

- Regional geodetic reference frame
- Realized by continuous GNSS observation of over 600 stations
- 28 countries
- Densify ITRF and improve access to ITRF
- Data are routinely processed by three Local Analysis Centres*
- Station coordinates made available publically

* Geoscience Australia
  Office of Surveyor-General Victoria, Australia
  Institute of Geodesy and Geophysics, Chinese Academy of Sciences
The velocity field for the APREF CORS network

G. Hu, M. Moore and J. Dawson (2016): An Update on the Asia Pacific Reference Frame (APREF)
Asia Pacific Regional Geodetic Project (APRGP)

- Annual GNSS campaign
- Densify ITRF and improve access to ITRF
- Data are analysed by Geoscience Australia
- Analysis report is distributed each year

- **APRGP 2019**: 15 to 21 September 2019
  - Participation from 16 countries and regions*
  - Processed by Dr. Guorong Hu, Geoscience Australia
  - Final report is available at UN-GGIM-AP Website

- **APRGP 2020**: 13 to 20 September 2020
  - Processing by Dr. Guorong Hu, Geoscience Australia

* Armenia, Bangladesh, Bhutan, Brunei, Cambodia, Hong Kong SAR, India, Indonesia, Japan, Lao, Mongolia, Myanmar, Philippines, Singapore, Tonga and Vietnam
Asia Pacific Regional Geodetic Project 2019

Figure 1 APRGP stations in the APRGP 2019 GPS campaign analysis along with the APREF stations and IGS stations, blue circles are APRGP campaign sites, and black triangles are APREF stations.

G. Hu: Report on the Analysis of the Asia Pacific Regional Geodetic Project (APRGP) GPS Campaign 2019
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Regional Height System Unification (APRHSU)

- Questionaries on current height system of each member countries
- Analyse the answers to understand current situation
- Planning next actions based on analysis
  Ex. Evaluate difference in height system among Asia-Pacific counties
  Compute averaged height reference surface among Asia-Pacific countries
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Capacity Building Events in 2020

- Following events were planned but postponed due to the COVID-19 pandemic.

- UN-GGIM WG-Disasters Conference 2020 in Tokyo, Japan, February 2020

- UN/Mongolia Workshop on the Applications of Global Navigation Satellite Systems in Mongolia, April 2020

- FIG Working Week 2020 in Amsterdam, May 2020 -> June 2021 in virtual

- Workshop on GNSS tsunami early warning and Geodesy4Sendai in Sendai, Japan, June 2020 -> 2021 in Sendai