Activity Report of UN-GGIM-AP WG1-
Geodetic Reference Framework for Sustainable Development

Chair
Dr. John Dawson, Australia

Vice Chairs
Mr. Basara Miyahara, Japan
Dr. Hanjiang Wen, China
Dr. Jayhyoun Kwon, Republic of Korea
Dr. Farokh Tavakoli, Iran

Outline

• Highlight the importance of Geodetic reference framework to disaster management and the need to build technical capacity in the Asia Pacific

• Overview the work of the UN-GGIM-AP Working Group on Geodetic Reference Framework for Sustainable Development
Location Enabled Society

National Mapping
Cadastre
Natural Hazards
Emergency Management
Transport
Construction

Land use planning
Geoscience (sea level rise, neo-tectonics etc)
(many more)

Earthquake and Tsunami
Sea Level Change

Human Induced Hazard
Sydney Basin, NSW
Volcanic Hazard

Surface deformation → volcanic plumbing

- Magma Chamber Inflation/Deflation


- Asia Pacific
  - Reference Frame (APREF)
  - Regional Geodetic Project (APRGP)
  - Regional Height System Unification
  - Geodetic Capacity Building

- Assisting with the development of a draft United Nations General Assembly resolution
  - A Global Geodetic Reference Frame (GGRF) for Sustainable Development.
Asia Pacific Reference Frame

- Providing station coordinates and their tectonic velocity

FOMO
Macau, China

KUAL
Malaysia

PTAG
Philippines
Asia Pacific Reference Frame
As of October 2014
• Data from 28 countries
• 16 national agencies participating
• 2 universities participating
• ~ 420 Asia Pacific stations now available
• ~ 600 stations analysed

Regional Geodetic Project
• A week of data every year since 1997
• Typically in September or October
• Typically temporary stations
• Targeted at those countries unable to participate in APREF
Regional Geodetic Project

Participating Stations - 2013 Campaign

- 2013 campaign report distributed to all participating countries
- Includes precise station coordinates
- Reports available for download from www.ga.gov.au
Regional Geodetic Project

- APRGP 2014 GNSS campaign ran from 7 September 2014 to 13 September 2014 (GPS week 1809)
- As of October, seven countries have contributed data to the APRGP 2014 GNSS campaign
- Issues for current APRGP annual GNSS campaign data have to be highlighted:
  - inconsistency between the site log sheets and RINEX file header information
  - non-completed site log files from some countries

Geodetic Capacity Building

- The Reference Frame in Practice Symposium Manila, Philippines, 21 – 22 June 2013
Geodetic Capacity Building

- FIG Pacific Small Island Developing States Symposium held in Suva, Fiji, 18 – 20 September 2013
- UN-GGIM-AP Technical Sessions at the XXV FIG 2014 on 19th June 2014 in Malaysia
- 2-Day workshop planned for 13th South East Asian Survey Congress, July 2015

Regional Height System Unification
Regional Height System Unification

- The objective of the Asia Pacific Regional Height System Unification (APRHSU) project: to encourage data sharing and facilitate technical exchange towards height system development in the Asia-Pacific region.

- A questionnaire on the current status of the height system in the countries of the Asia-Pacific region has been developed and distributed, see http://www.un-ggim-ap.org/wg/wg1.htm

Steering Committee of APRHSU

- The steering committee are organized to support the methodology, standardization, and guidelines:
  - Dr. John Dawson (Australia)
  - Prof. Will Featherstone (Australia)
  - Dr. Yuki Kuroishi (Japan)
  - Dr. Wen Hanjiang (China)
  - Prof. Kamaludin Omar (Malaysia)
  - Prof. Chalermchon Satirapod (Thailand)
  - Dr. Ibnu Sofian (Indonesia)
Status of APRHSU Questionnaire

- The APRHSU questionnaire addresses vertical datum, vertical positioning and vertical control network
- Twelve responses received:
  - Australia, Azerbaijan, Bangladesh, Brunei, China, Hong Kong, Macao, Malaysia, Mongolia, Japan, Iran, Philippines
  - All responses are from government agencies or organizations responsible for the vertical reference control

Analysis APRHSU Questionnaire

- 9 out of 12 responded that the vertical datum is based on the tidal observation (2 from neighboring country, 1 with geoid)
- 10 out of 12 responded that two or more kinds of height (orthometric, ellipsoidal, normal height) are being used
- 6 out of 12 are measuring gravity and 9 use GNSS measurement for vertical control
- 6 out of 12 has the standardized format for vertical product
Future Work: APRHSU

- Re-distribute and Analysis of the questionnaire
- Development of an optimal methodology for height unification
- Development of standards for vertical system
- Development of a web-based Map for accessing products from APRHSU

Other activity

- Involved in the development of a United Nations General Assembly resolution entitled “A Global Geodetic Reference Frame (GGRF) for Sustainable Development”.
- The working group has specifically assisted with the development of the:
  - Draft UN-GGIM Geodesy Concept Note
  - Draft UN-GGIM Geodesy resolution
  - UN-GGIM Geodesy Fact sheet
  - UN-GGIM Geodesy presentation
  - UN-GGIM Geodesy animation (https://vimeo.com/89695290)
A GLOBAL GEODE蒂C REFERENCE FRAME which allows us to know where people and places are on the Earth.

Thankyou for your attention
For further information: Dr John Dawson
Email: John.Dawson@ga.gov.au