Open meeting on UN Subcommittee on Geodesy and Education, Training and Capacity Building

Mikael Lilje – Team leader ETCB
Education, Training and Capacity Building Efforts in support of the GGRF Roadmap Implementation Plan

Proposed Five-Year Education, Training, and Capacity Building Implementation Plan

Mikael Lilje (Sweden), Focus Group Lead
Augustin Bamouni (Burkina Faso), Graeme Blick (New Zealand), Allison Craddock (United States), Paul Cruddace (United Kingdom), Basara Miyahara (Japan), Maria Cristina Pacino (International Association of Geodesy), Dan Roman (United States), Robert Sarib (Australia), Sharafat Gadimova (UNOOSA International Committee on GNSS)

May 2018
United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) Overview

UN-GGIM is a formal inter-governmental UN Committee of Experts to:

• Discuss, enhance and coordinate GGIM activities by involving Member States at the highest level
• Work with Governments to make joint decisions and set directions on the use of geospatial information within national and global policy frameworks
• Address global issues and contribute collective knowledge as a community with shared interests and concerns
United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) Overview

UN-GGIM is a formal inter-governmental UN Committee of Experts to:

- Develop effective strategies to raise geospatial awareness and usefulness, to develop capacity particularly in developing countries
- To make timely, reliable, and authoritative geospatial information consistently and readily available to support national, regional, and global development.

- UN-GGIM-Regions as e.g. UNGGIM:Europe
- UN-GGRF WG => Subcommittee on Geodesy
Major work items of the UN-GGIM

- A global geodetic reference frame
- Adoption and implementation of standards
- Determining global fundamental data sets
- Geospatial information supporting sustainable development
- Identification of trends in national institutional arrangements in geospatial information management
- Integrating geospatial, statistical, and other forms of data
- Legal and policy frameworks
- Land administration and management
- Disaster risk reduction and resiliency
- Marine geospatial information
An accurate, sustainable and accessible Global Geodetic Reference Frame to support science and society

Photo: Bjørn-Owe Holmberg
UN Resolution 2015: Global Geodetic Reference Frames for Sustainable Development
Based on work with UNGGIM working group on Geodesy

Discussing e.g.
- Need of global geodetic infrastructure
- Data sharing
- Education, Training and Capacity Building
The UN-GGIM Committee of Experts

• Endorsed the global geodetic roadmap in 2016 as a “principle-based briefing document for national Governments”
• Welcomed the development of an implementation plan to link the road map recommendations to national policy developments
• Elevated the GGRF working group (WG) in 2017 to a Sub-Committee on Geodesy (SCoG) to strengthen the GGRF
• Requested the development of a position paper to define the appropriate governance arrangements for the GGRF. To be presented in 2018.
The start of the UNGGIM Subcommittee on Geodesy

First formal meeting held 26-27 November, 2017
GGRF road map key issue categories
The ETCB focus group seeks to

- assess the current availability of education, training, and capacity building resources

- identify gaps in capacity or other areas of need

- propose short- and long-term solutions to realize the full scientific and social benefit of the Global Geodetic Reference Frame.
Think globally, act regionally?

• Even though basic ETCB needs are global, a regional focus strategy is essential!

• The nature, size, and variety of challenges differ regionally and may include linguistic, technological, economic, and cultural impediments.

• It is also clear that access to highly skilled personnel varies widely among Member States, thus necessitating the need to ensure that knowledge and competence is readily and openly shared.

• A key to optimizing the efficiency of the group’s objectives is to identify and make existing educational and capacity building resources easily discoverable.
Our currently proposed mission

Five years from now there will be:

- A higher level of geodetic technical capability, particularly among developing nations
- A developed capacity building programme that focuses at the regional level and emphasizes supporting efforts in developing nations
- Recognized certification and achievement documentation programs, supported by regular technical training courses and material that is openly available to all nations
Our currently proposed mission

Five years from now there will be:

- A permanent working group for UN Geodesy Education, Training, and Capacity Building established and operating under the auspices of the UN GGIM Subcommittee on Geodesy
- Documented evidence of geodetic education, training, and capacity building in support of the United Nations Sustainable Development Goals (SDGs).
Proposed Next Steps

• Provide a framework for Member States to identify their ‘Level’ of competency and capacity requirements
• Maintain a register of Member States self-reported ‘Level’ of competency, and professional and technical requirements
• Identify training and educational gaps for Member States, working on a regional basis where appropriate
• Provide training modules and assist with running specialized training courses to fill gaps
• Encourage other agencies to run specialized training where gaps have been identified
• Maintain a register of courses and training opportunities
• Maintain a register of trainers and training institutions
Self-evaluation questionnaire sent out

- Response will be evaluated coming months. Evaluation both concerning feedback on questionnaire as well as responses.
- Using the results from the questionnaire we will be able to present an implementation plan for the subcommittee to consider at its next meeting.

<table>
<thead>
<tr>
<th>Level</th>
<th>Competence Requirements</th>
<th>Training provided by</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic understanding of:</td>
<td>Educational institutions – universities and polytechnic institutes</td>
<td>Countries that might have one CORs and maintain a traditional geodetic network of reference marks – e.g. small Pacific Island Nations?</td>
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<td></td>
<td>- GNSS</td>
<td>Government mapping agency</td>
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<td></td>
<td>- Reference frames, including geoid models, vertical and horizontal datums</td>
<td>Private companies</td>
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<tr>
<td></td>
<td>- Geoid models, precision, determinations and basic implementation</td>
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<td></td>
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<tr>
<td></td>
<td>- Implementation of a vertical datum including use of geoid models</td>
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<tr>
<td>2</td>
<td>The above plus knowledge of:</td>
<td>Educational institutions – universities and polytechnic institutes</td>
<td>Countries with small CORs network and those who adopt global Reference frames for their nation reference frames – e.g. Fiji?</td>
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<td></td>
<td>- Constructing, building and running a small CORs network</td>
<td>UN-GGIM Geodesy Capacity Group</td>
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<td></td>
<td>- GNSS processing using standard software - e.g. Trimble, Compass Solution (ComNav), LGO(Leica),….</td>
<td>FIG</td>
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<td></td>
<td>- Least squares processing and provision of datum access</td>
<td>Government mapping agency</td>
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<tr>
<td></td>
<td>- Geoids models, precision, determinations and basic implementation</td>
<td>Private companies</td>
<td></td>
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<td></td>
<td>- Implementation of a vertical datum including use of geoid models</td>
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<td>3</td>
<td>The above plus high knowledge of:</td>
<td>Specialized courses – e.g. geoid school</td>
<td>Countries with a more extensive CORS and developing their own specialized national and vertical datum – e.g. New Zealand and Sweden?</td>
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<td></td>
<td>- Implementing and running large CORs networks</td>
<td>UN-GGIM Geodesy Capacity Group</td>
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<td></td>
<td>- High end GNSS processing and datum access</td>
<td>IAG and FIG</td>
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<td></td>
<td>- Geoid model computation and implementation into a vertical datums</td>
<td>Government mapping agency</td>
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<td></td>
<td>- Monitoring earth dynamics and including in datum realization</td>
<td>Private companies</td>
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<td></td>
<td>- Geodetic database management</td>
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<td>4</td>
<td>The above plus expert knowledge of:</td>
<td>IAG</td>
<td>Countries engaged in Global Reference frame determination and Geodesy Science - e.g. US, Australia and Germany?</td>
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<td>- Reference frame determination and computation</td>
<td>Specialist training courses run by NASA/JPL – e.g. on VLBI or SLR</td>
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<td>- High end GNSS analysis and processing</td>
<td>Private companies</td>
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<td>- SLR including analysis and processing</td>
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<td>- VLBI including analysis and processing</td>
<td>Specialized software training courses – e.g. Bernese</td>
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<td></td>
<td>- Gravity collection, processing and geoid determination</td>
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<td>- Analysis centre – combining various geodetic techniques to determine reference frame parameters</td>
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<td>- Use of other potential geodetic techniques – e.g. DORIS and InSAR</td>
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Questions to be discussed

- What are the main challenges for your country / region regarding a long term, stable reference frame and competence connected to this?

- What are the main impediments for your country / region?

- What could be FIGs role?

- Can your country contribute in regards of training / expertise to your region?
First United Nations World Geospatial Information Congress
27 – 29 November 2018
Deqing, Zhejiang, China