



Mongolian Geo-spatial Association
<http://www.geomedeelel.mn>

GNSS ACTIVITIES IN MONGOLIA

OCHIRKHUYAG Lkhamjav (OCHIROO)
ochirkhuyag@geomedeelel.mn

UN/FIJI Workshop on the Applications of GNSS, June 24-28, 2019

Suva, Fiji,



BACKGROUND

FACTS

- 1,564,000 sq.km
- 3,250,000 people
- Language: Mongolian
- Main religions: Buddhist (53%), Shamanist (3%), Muslims (3%), Christian (2%)
- GDP ~4,000\$
- HDI 0.741
- Parliament democracy
- Government: 13 Ministries, 21 Agencies

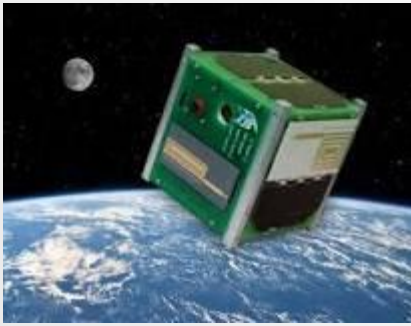


Photos: Alina Reyzelman

Source: NSO



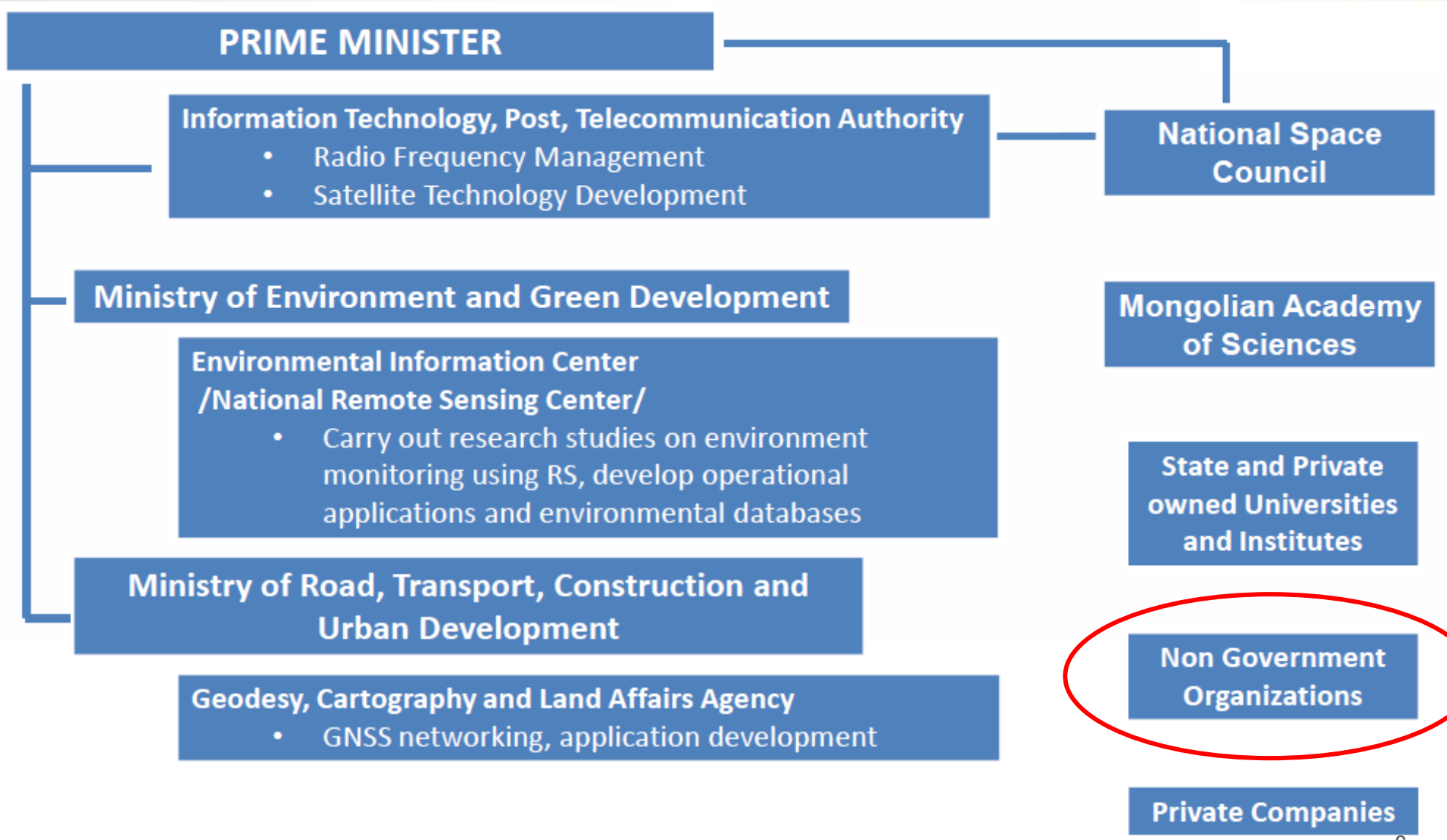
SPACE TECHNOLOGY IN MONGOLIA



- 1965: Space technology and application is started under INTERCOSMOS program
- 1970: First Telecommunications satellite data receiving station "ORBIT"
- 1970: World meteorological satellite data receiving ground station is established /NRSC/
- 1981: J. Gurragchaa, the first cosmonaut of Mongolia the 2nd Asian in the space.
- 2017: Mazaalai /CubeSAT/, the first satellite in the space



SPACE TECHNOLOGY RELATED ORGANIZATIONS





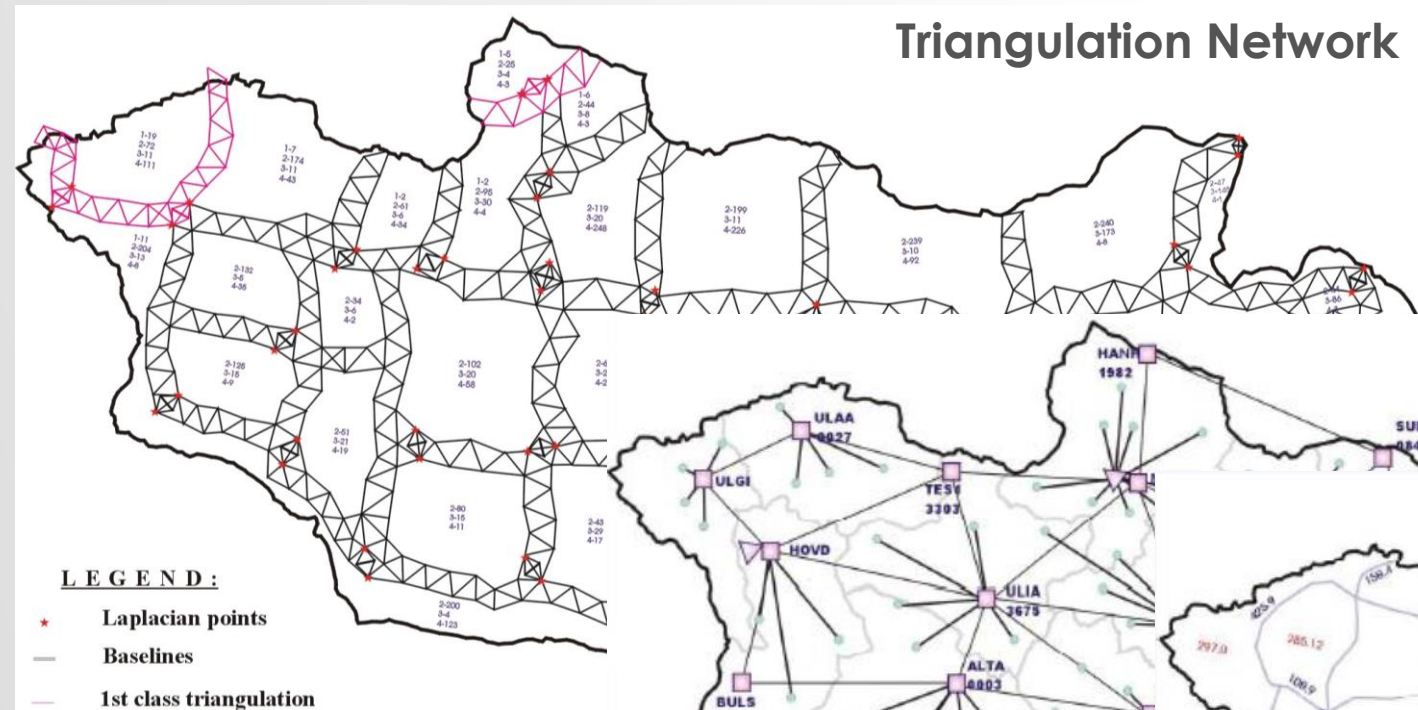
GNSS NETWORKS IN MONGOLIA

- In the past, the Mongolian triangulation, gravity and leveling networks were based on Soviet Union, meaning the old Pulkovo-42 reference system, Krassovsky reference ellipsoid and height system was Baltic sea.
- 2009, Government Resolution No.25:
 - Coordinate system – WGS 84 (ITRF 2000 epoch 1997.8 /MonRef 97/)
 - Height system – Baltic Sea
 - Projection - UTM
- 2014, ALAGAC Resolution No. A/112 and A/261
 - ITRF2008 epoch 2005.0
 - Mongolian Geoid Model (MONGEOID 2012/2014)

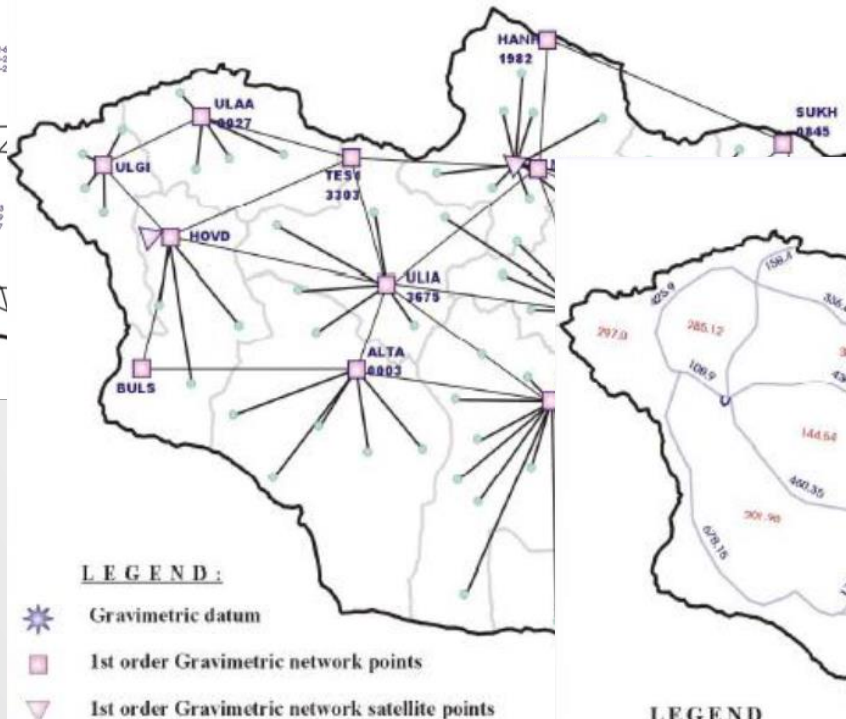


GNSS NETWORKS IN MONGOLIA (2)

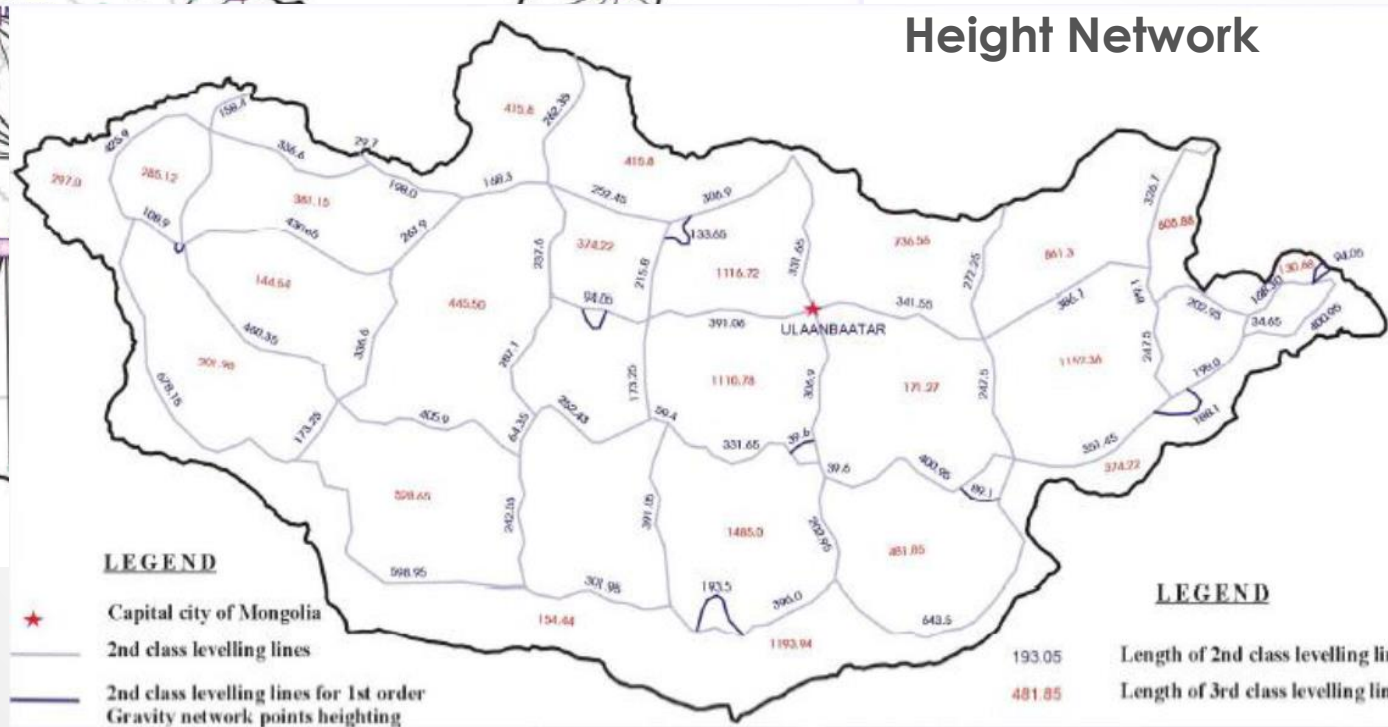
Triangulation Network



Gravity Network

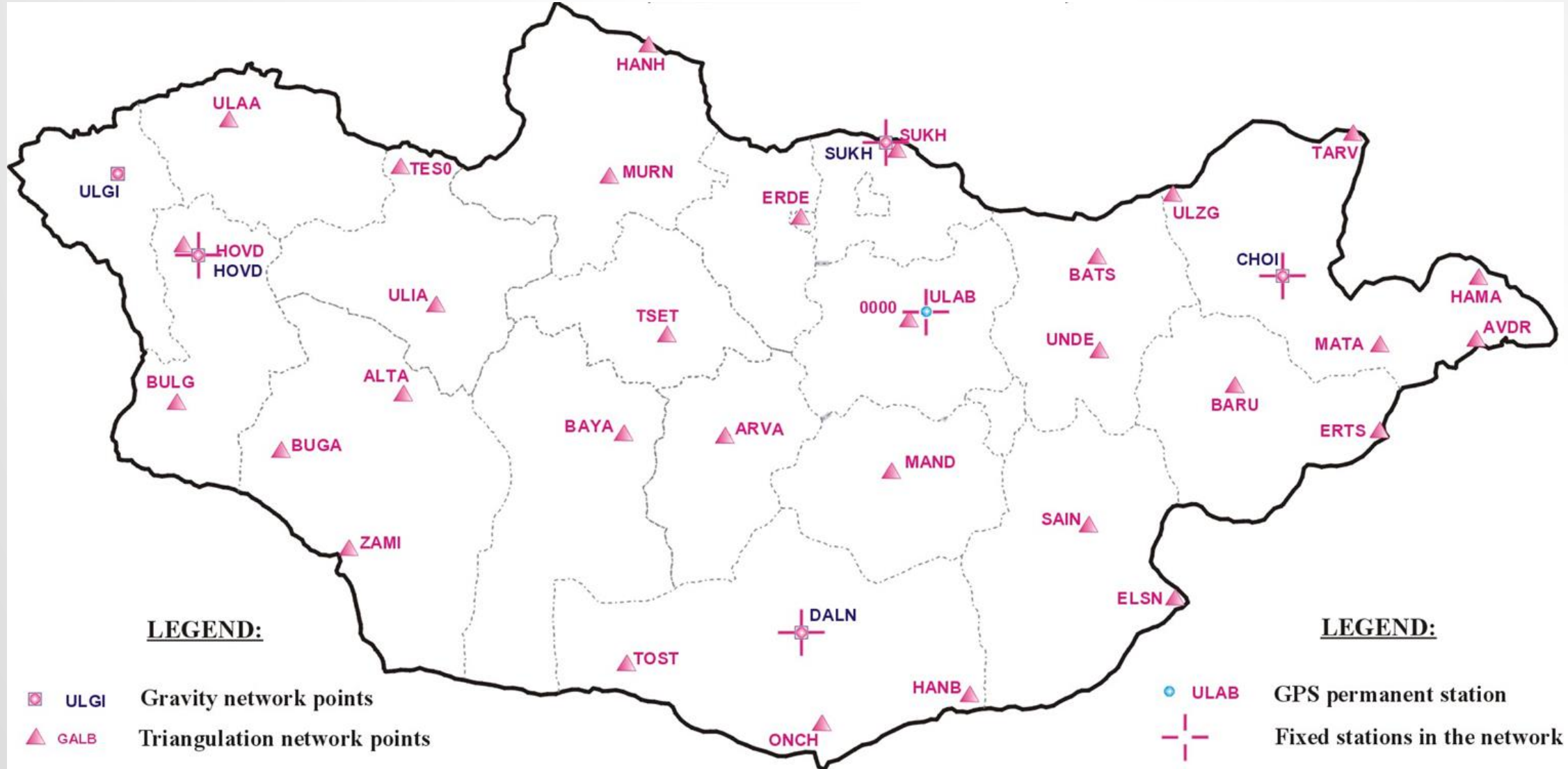


Height Network



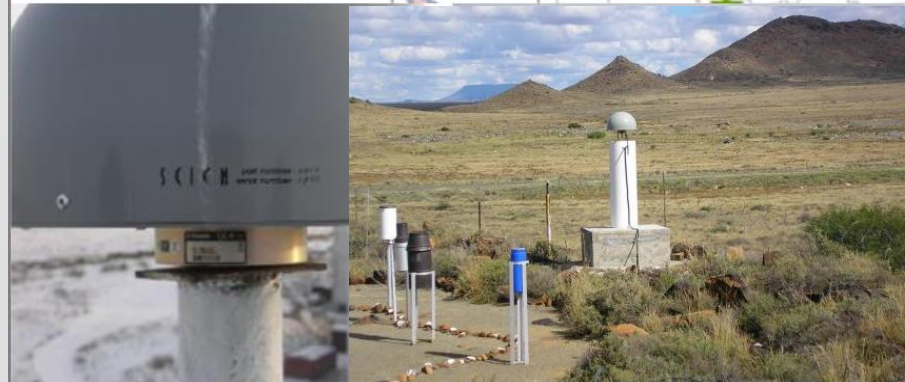
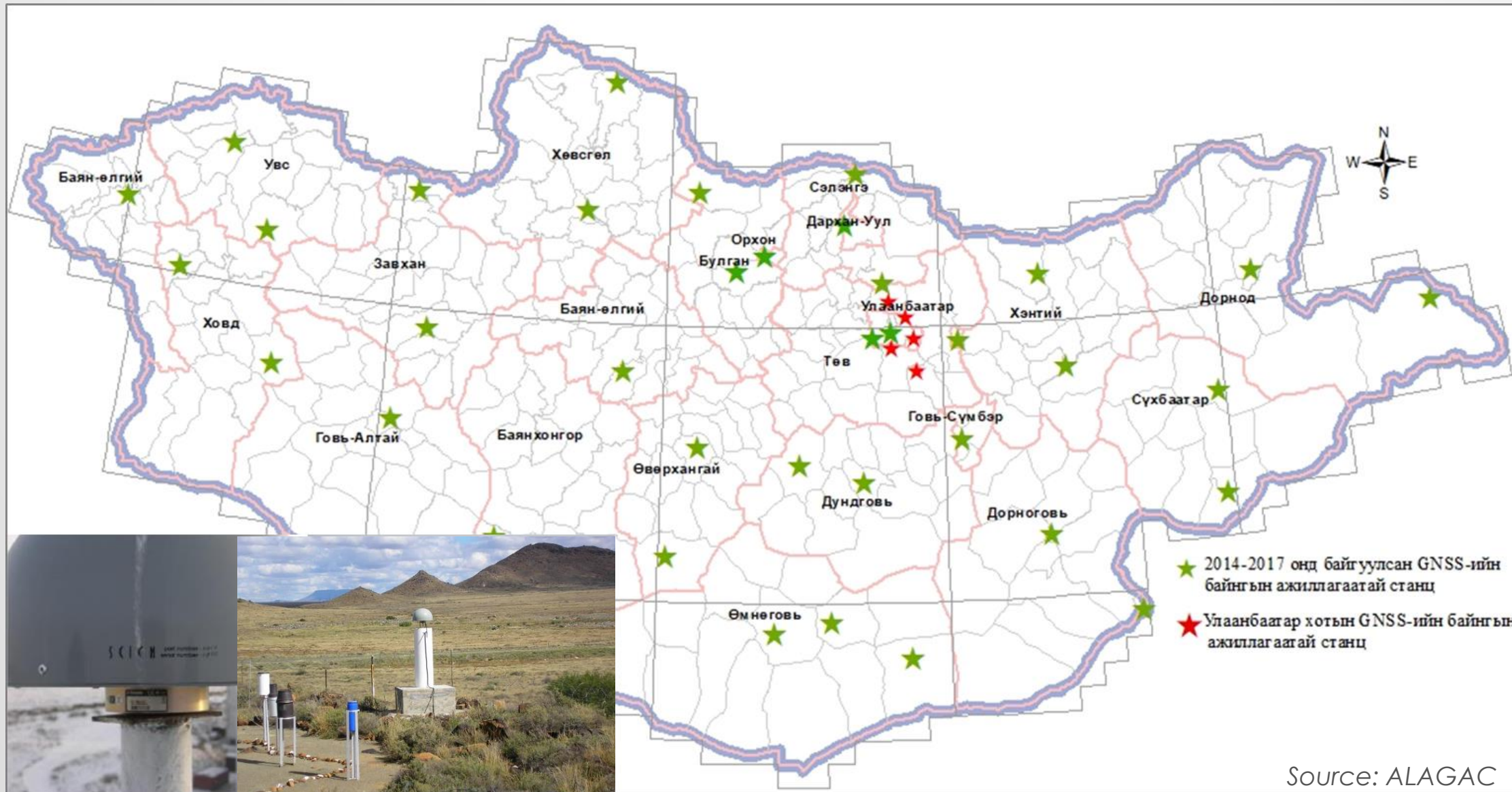


GNSS NETWORKS IN MONGOLIA (3) : MONREF 97





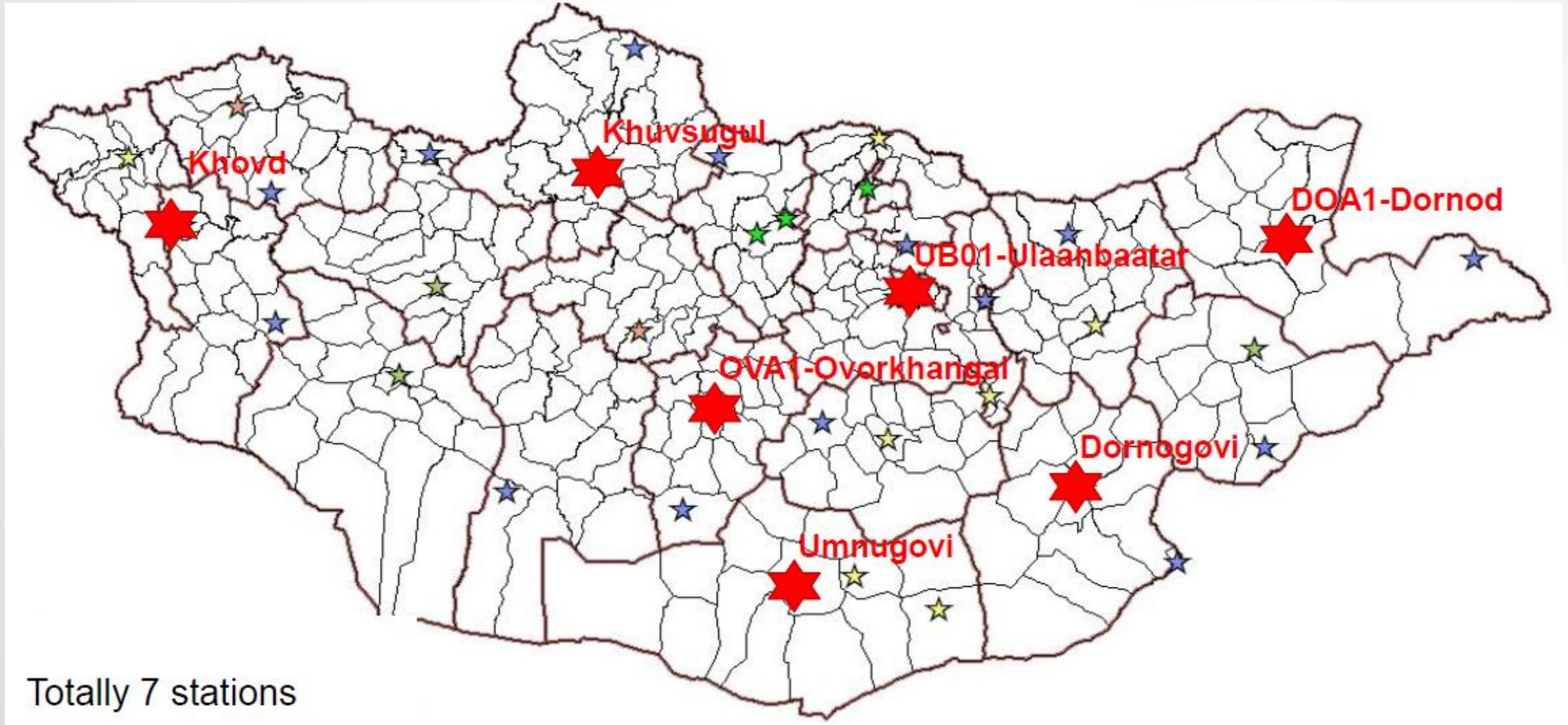
GNSS NETWORKS IN MONGOLIA (4) : CORS



Source: ALAGAC



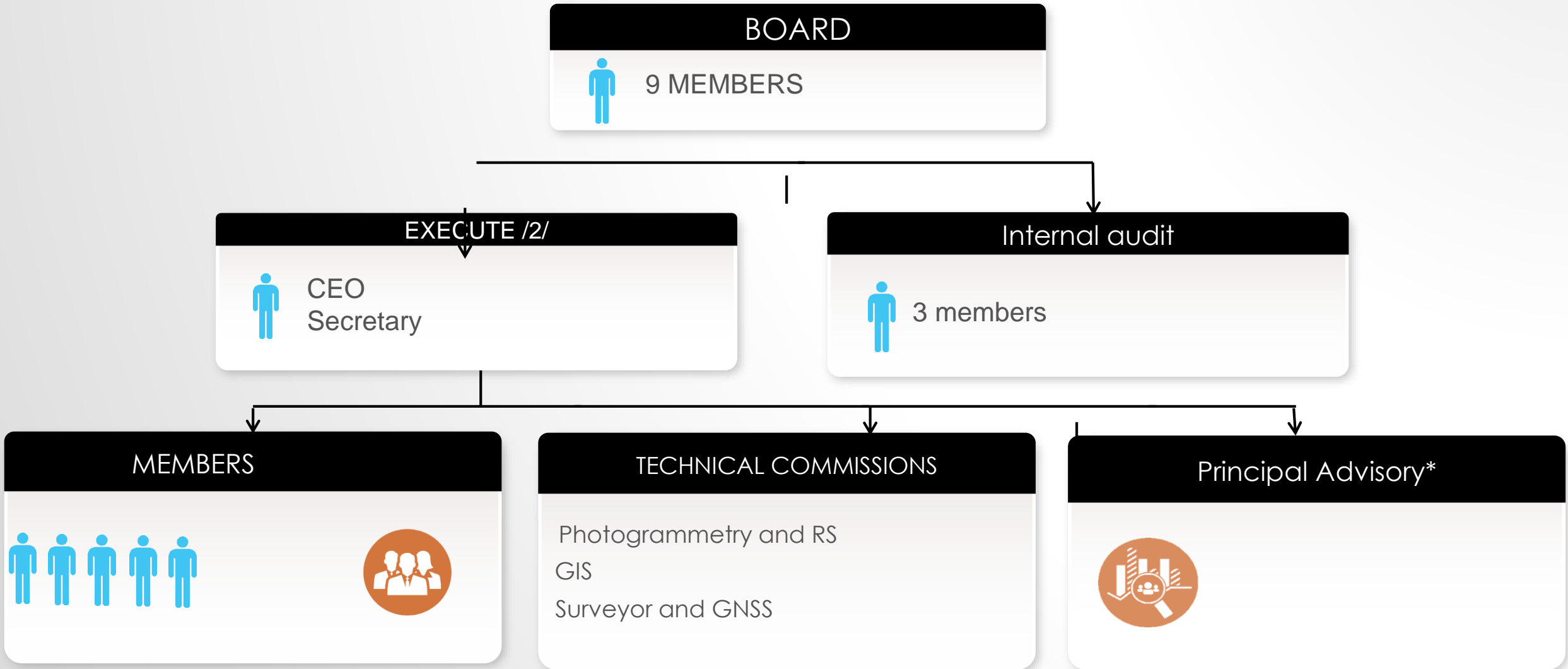
GNSS NETWORKS IN MONGOLIA (5) : APREF



Totally 7 stations



STRUCTURE OF THE ASSOCIATION

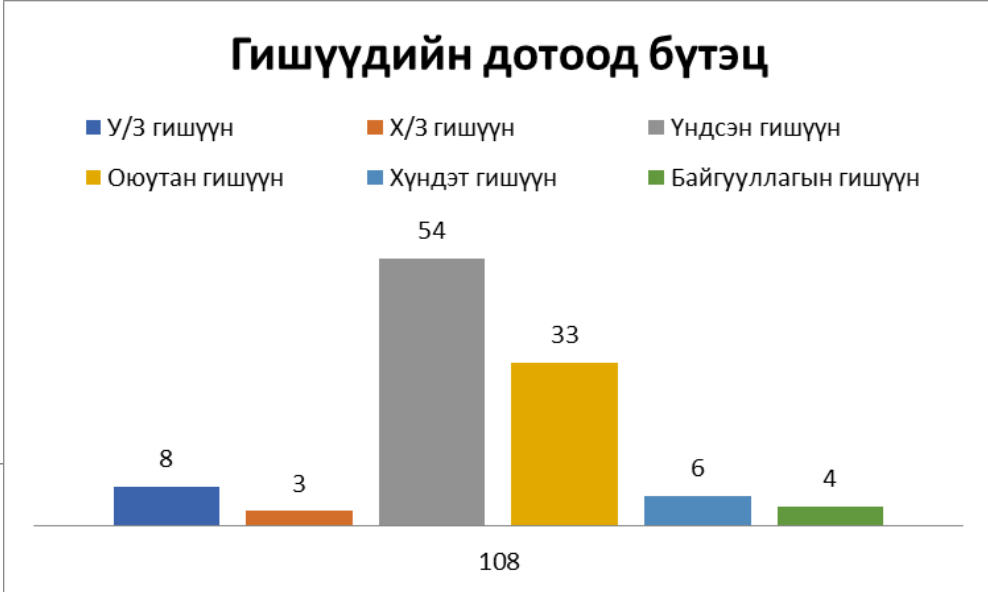
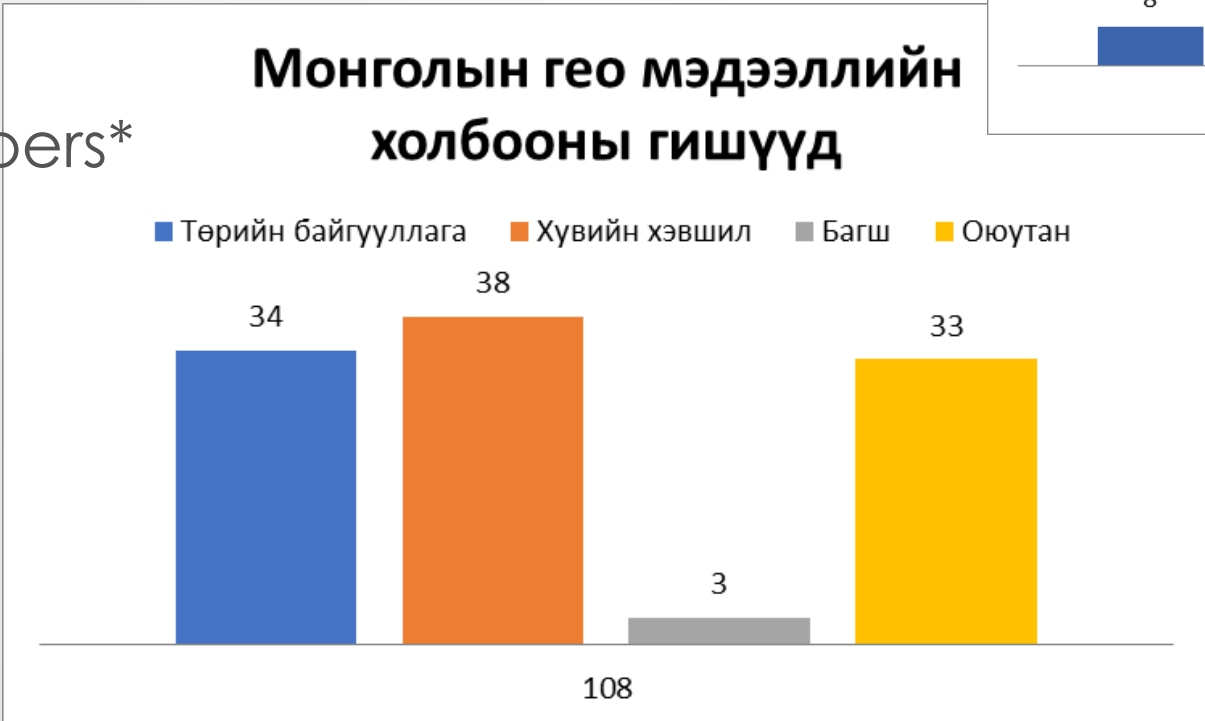




MEMBERS / COMMUNITIES

TYPE OF MEMBERS

- Student
- Regular
- Institution
- Honorary members*
 - Advisory





INTERNATIONAL ACTIVITIES





ACTIVITIES

1500

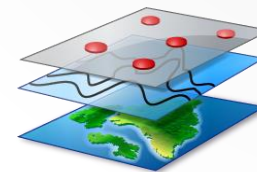


Geo-meeting



Monthly

Geo-workshops



Quarterly

10

Workshops



GIS day

GISday

Annual

Geo-forum

ГЕО-ФОРУМ

Annual



Since
2014

8
times/
per year

Totally
40



GEO-MEETING

Knowledge sharing and
Networking event



2 presentation about geo-spatial
technology and applications



GEO-INFORMATICS/ГЕО-МЭДЭЭЛЭЛ/ (ARCHIVES OF GEO-MEETING)

- This publication is a peer-reviewed journal for Mongolian geo-spatial, which publishes presentations, reports, news, information and geo-activities of the association.
- General requirements: One day the GIS DAY will be printed and distributed.
 - The final date of the story: August 31, every year;
 - The number of page sheets is not less than 6 at least 6;
 - 20 mm from each side of the frame;
 - Page size: B5;
- Editor-in-chief: B.Bayarkthlag, Ph.D: 95113264
- Contact: info@geomedeelel.mn, bayartungalag@geomedeelel.mn



GIS DAY



Every year since 2014

On average, over 200 specialists, students, and users attend a meeting.

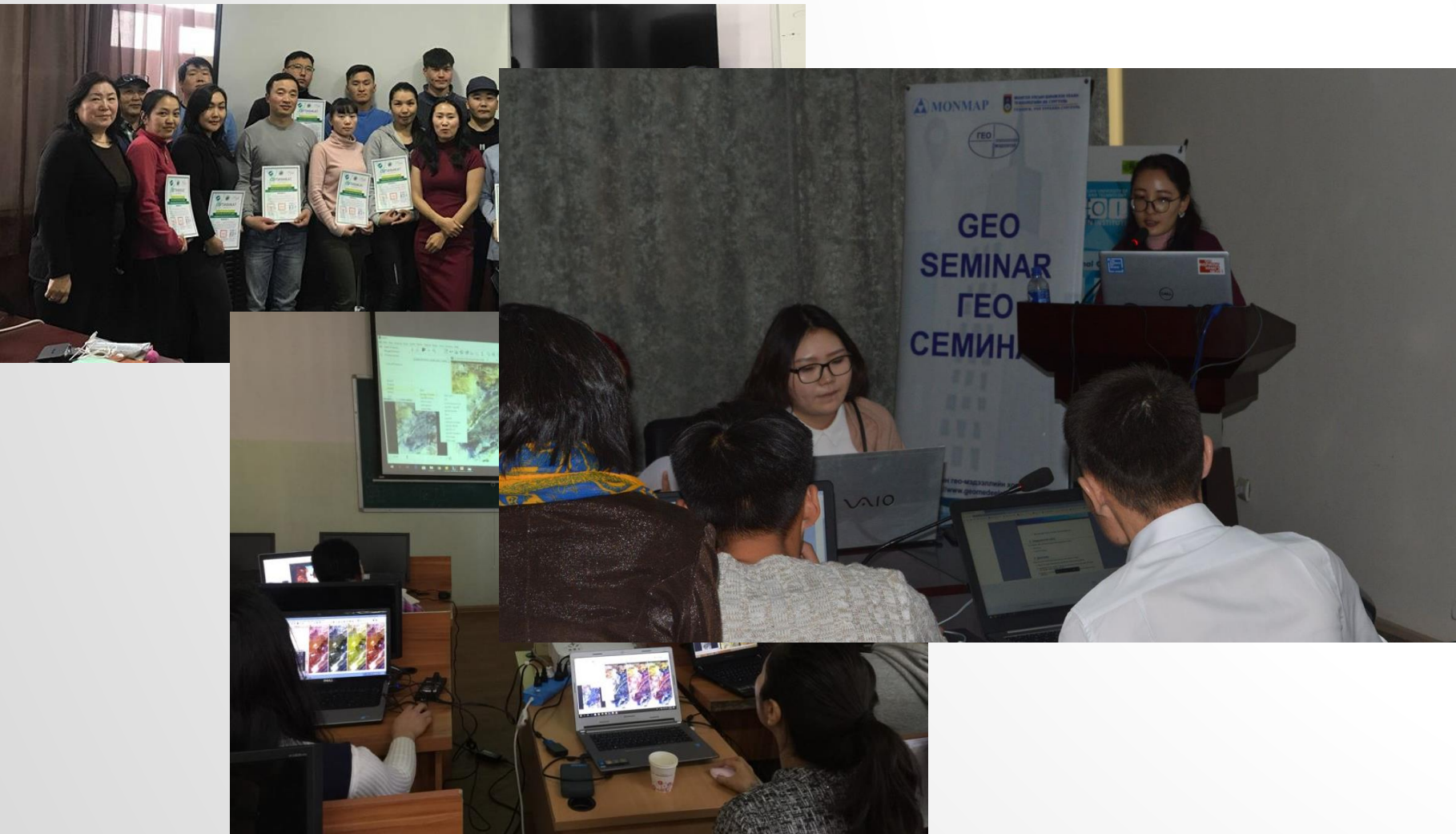
Speakers introduce new technologies, their research, new approaches in the geospatial technology.



The afternoon event was organized jointly by Mongolian University of Science and Technology, with the support of MonMap LLC. The training was organized by the Geo-Seminar: ArcGIS Pro Software Introduction and Application. / 2018 /



GEO-TRAINING/GEO-SEMINAR



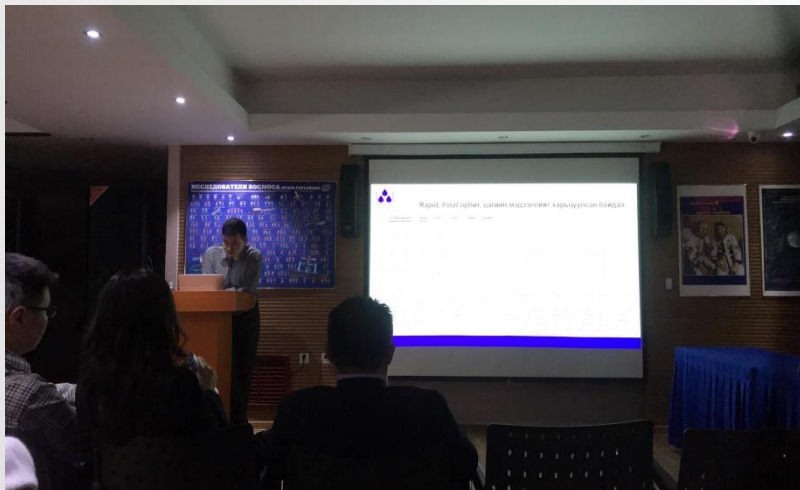
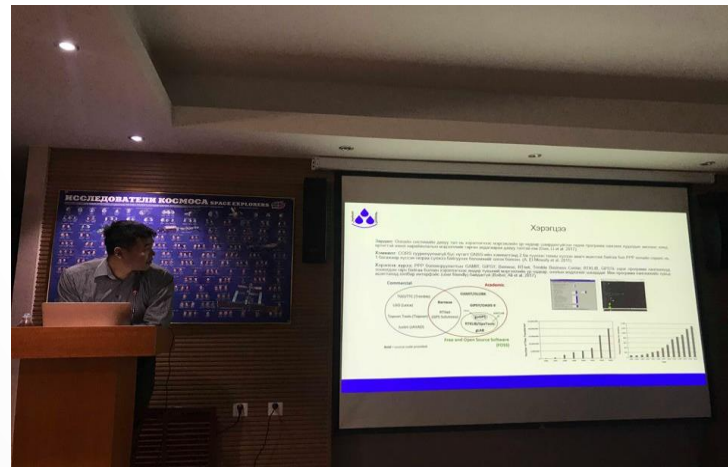
- Remote sensing:
SENTINEL data
processing
- GIS: ArcGIS Pro
- **GNSS:**
GAMIT/GLOBK
training





GEO-FORUM: APPLICATIONS OF THE GNSS

In collaboration with Institute of Astronomy and Geophysics of the Mongolian Academy of Sciences, "Geo-Forum: Applications of the GNSS" was successfully organized on April 17, 2019.





RESEARCH/PROJECTS

- “A Spatial Distribution Map For Risk Areas Of Forest And Steppe Fire”, Ministry of Nature, Environment and Tourism, 2017;
- “SDI Cookbook Published In Mongolian Language”, Global SDI Association’s Small Grant, 2017;
- “Establishing an Open Repository and Catalogue for Geospatial Educational Resources”, ISPRS Education and Capacity Building Initiatives 2018; URL: <http://isprs.education>
- Asia-Pacific Space Cooperation Organization (APSCO) **International GNSS Monitoring and Assessment” (iGMA) project**, Since 2018.



INTERNATIONAL GNSS MONITORING AND ASSESSMENT (IGMA) PROJECT

- September 2011, ICG-6. China proposed GNSS service performance should be monitored by some international third party organization. IGMA task group co-chaired by China, IGS and Japan was setup with its objective and tasks to promote international GNSS monitoring and assessment activities.
- Mongolia Government, member of APSCO, is granted to our association for the local institution of APSCO-iGMA project implementation.
- APSCO **International GNSS Monitoring and Assessment” (IGMA) project in Mongolia** is implemented with our members, New Mongol Institution of Technology and Chandmani Survey, LLC, Since 2018.



Ulaanbaatar, Sep, 2018,



Uvs, Jun-2019

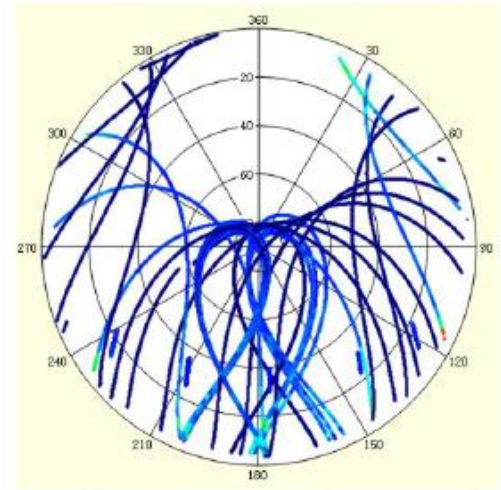


INTERNATIONAL GNSS MONITORING AND ASSESSMENT (IGMA) PROJECT (2)

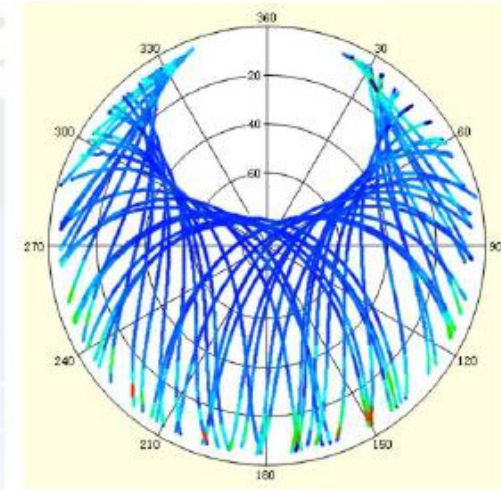
Mongolia (ulbt)

Skyplot

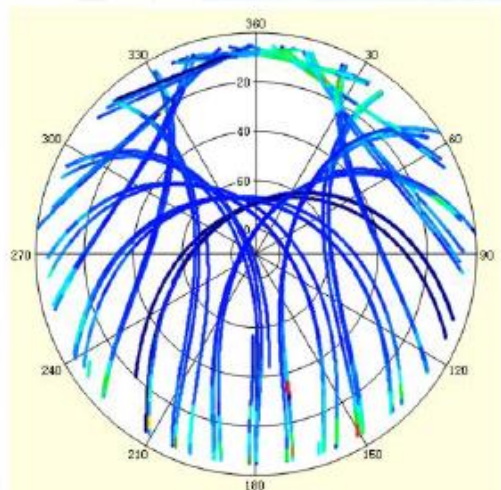
BDS



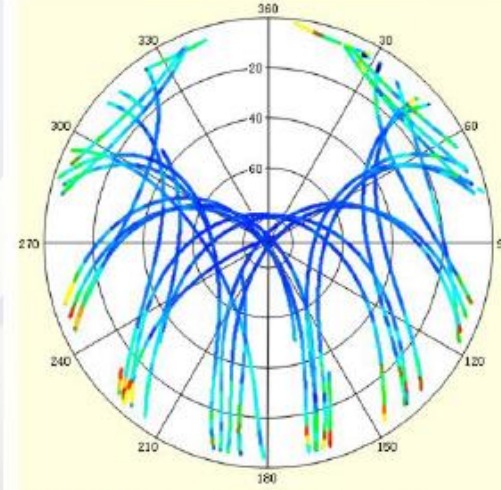
GPS



GLONASS



Galileo



Test Date: Sep.13, 2018

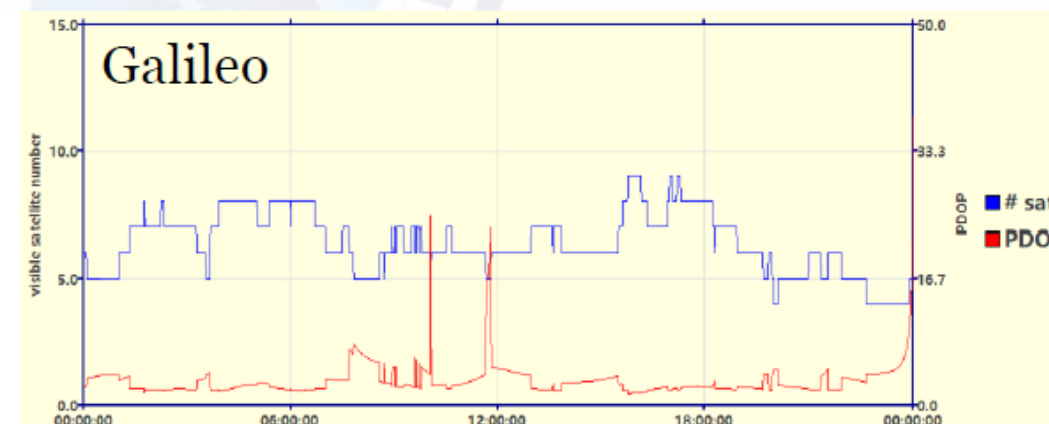
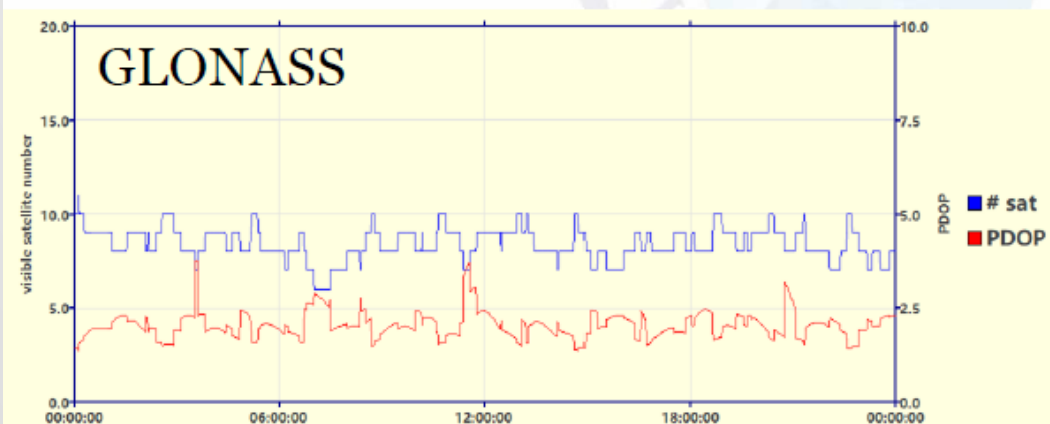
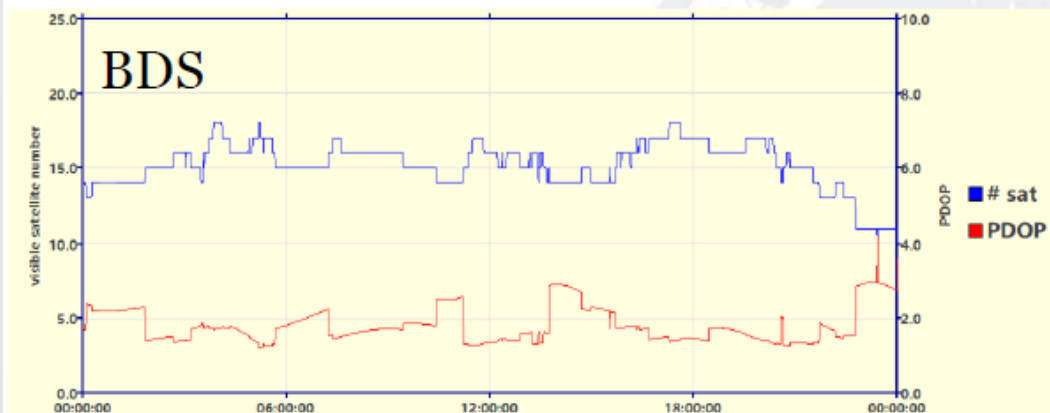
Source: APSCO



INTERNATIONAL GNSS MONITORING AND ASSESSMENT (IGMA) PROJECT (3)

Mongolia (ulbt)

Number of Visible Satellites and PDOP



Test Date: Sep.13, 2018

Source: APSCO

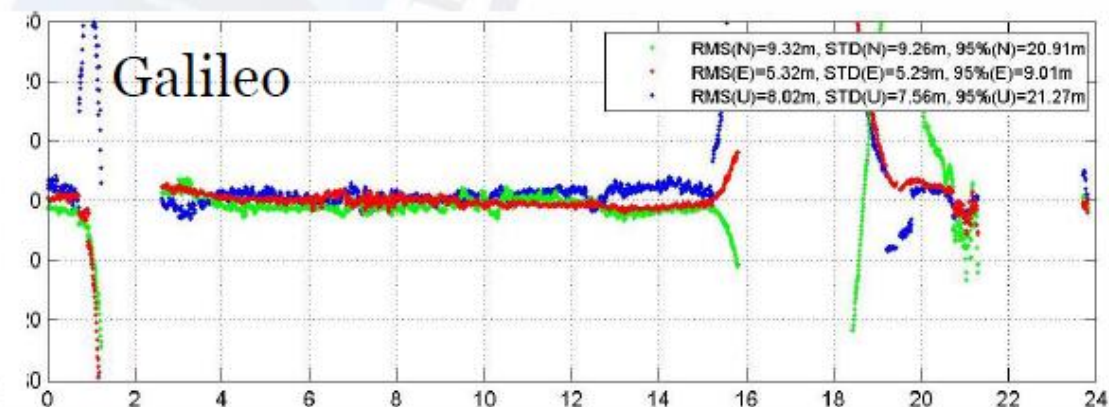
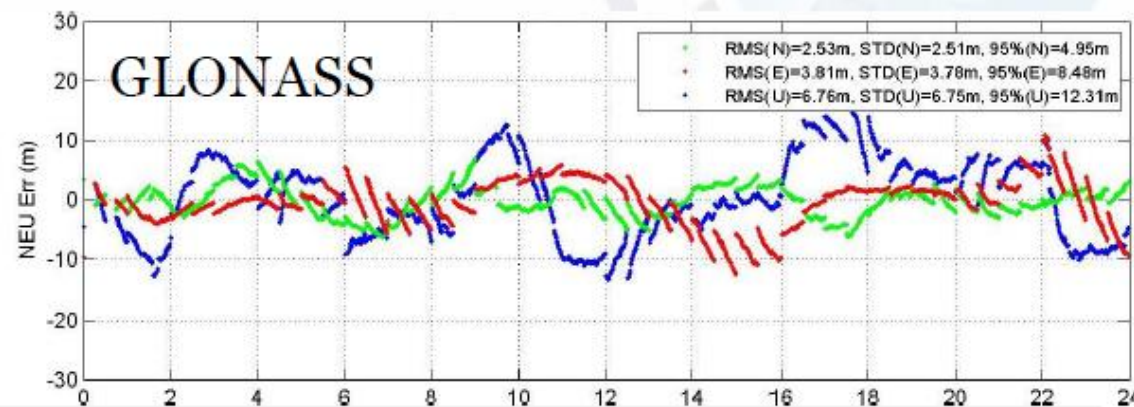
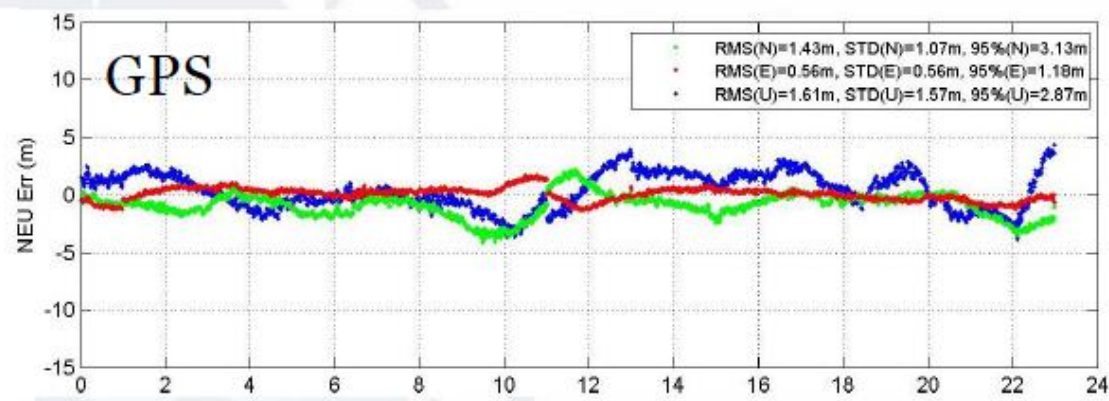
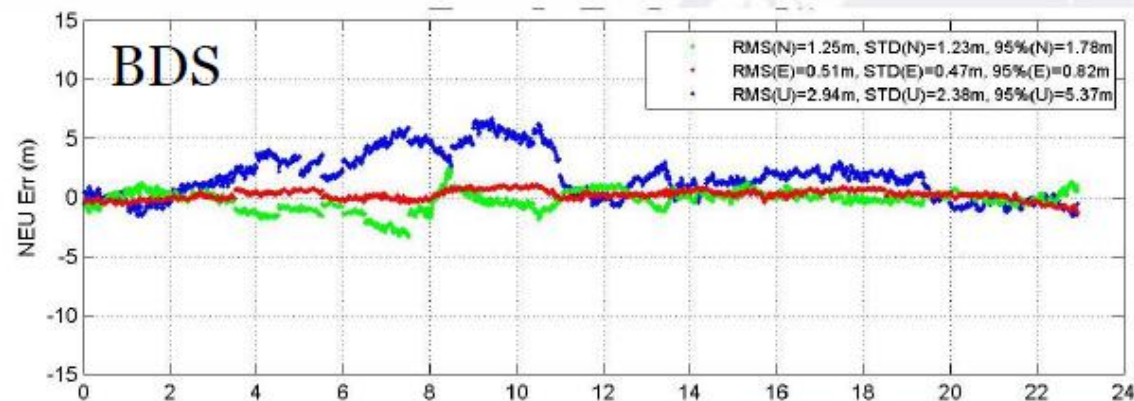


INTERNATIONAL GNSS MONITORING AND ASSESSMENT (IGMA) PROJECT (4)

Mongolia (ulbt)

Positioning Error

— N — E — U





SUMMARIES/CHALLENGES

- Human resources
- Technology
- Financial issues

NEXT STEPS/ACTIVITIES

- GNSS Trainings
 - National (geo-workshops, geo-training, geo-seminars etc)
 - International (Summer school etc)
- UN/MONGOLIA Workshop on the Applications of the GNSS, April/May, 2020 ???



CONTACT

www.geomedeelel.mn

SOCIAL MEDIA

- <https://www.facebook.com/MonGeospatialAssoc/>

E-MAIL

- info@geomedeelel.mn,
members@geomedeelel.mn



ACKNOWLEDGEMENT

- United Nations Office for Outer Space Affairs
- International Committee on Global Navigation Satellite System
- University of the South Pacific



UNITED NATIONS
Office for Outer Space Affairs





QUESTIONS?

