



# Nordiska kommissionen för Geodesi Nordic Geodetic Commission

Working Group for Geodynamics and Earth Observations

## Minutes of the 44th meeting of the Working Group for Geodynamics and Earth Observations, within the Nordic Geodetic Commission

The meeting was hosted by the National Land Survey of Iceland on 10 March 2020 in Reykjavik, Iceland. It was organized together with the meeting for the Working Group of Future Height Systems and Geoid. Both meetings took place at Icelandair Hotel Reykjavik Natura, in Meeting Room #5.

### Participants:

Denmark	Gabriel Strykowski
Estonia	Andres Rüdja, Sander Varbla
Finland	Mirjam Bilker-Koivula, Maaria Nordman (Secretary), Veikko Saaranen
Iceland	Guðmundur Valsson
Latvia	Katerina Morozova, Lubova Sulakova, Madara Znotiņa, Vents Zuševics
Lithuania	Eimuntas Parseliunas
Norway	Ove Christian Dahl Omang, Olav Vestøl
Sweden	Andreas Engfeldt, Maxime Mouyen, Per-Anders Olsson, Holger Steffen (Chair)

## 1. Introduction

The chair welcomed everyone.

The agenda was approved.

The minutes of the last meeting were approved.

Maaria Nordman was appointed as secretary. The chair noted that also the secretary duty should be shared among the countries. In the last 6 years, Estonia, Latvia, Norway and Sweden provided the minutes. As Maaria (Finland) wrote the minutes this time, the secretary will come in the next three years from one of these countries: Denmark, Iceland, Lithuania. In 2024, it will be Estonia's turn.

The chair shortly introduced the topics that would be covered during the day. The inputs from the Presidium and the workshop of the previous day relating to working group (9.3.) were also shortly discussed. The topics were GIA, absolute gravity data, InSAR, relative gravity and NKG products.

## 2. InSAR

The topic was introduced as a discussion topic, since there were no presentations.

Estonia has started working with Geodetic SAR (presentation on following day). Latvia has planned some tests for InSAR for 2020. Sweden has been testing the system and trying to find the role between geodesy and SAR, Finland's activities have been very similar. Estonia, Finland and Sweden are all involved in the ESA funded Geodetic SAR project.

It was concluded that the role of NKG and WGCEO should be providing a discussion forum for InSAR and Geodetic SAR and share experiences, best practices and thoughts within the community. Thus, it was decided that InSAR should be kept on the agenda also for future meetings.

### 3. Glacial Isostatic Adjustment

The topic was started with a presentation:

- Erja Huuskonen, Maaria Nordman & Mirjam Bilker-Koivula: "Sea level rise and land uplift in Kvarken and Höga Kusten by 2300"

The ground for discussion was presented by Holger, with title "NKG2022GIA activity status March 2020". It was clear that many improvements have happened since the last NKG GIA model (2016) that could be implemented into the new model. Such things include corrected 3D velocity field, climate change effect-corrected tide gauge data, elastic effects of present-day mass movements, etc. It was suggested that Vents could start working with GIA models, e.g., comparing SELEN-derived results with previous ones. It was decided that Holger, Maaria, Valentina Barletta, Vents and other involved people (or their bosses) discuss the implementation in a smaller group.

Holger presented also another topic with presentation:

- Holger Steffen, Halfdan P. Kierulf, Olav Vestøl, Andrzej Araszkiwicz, Kamil Kowalczyk, Valentina Barletta: "BIFROST2020 and NKG202XLU"

The new BIFROST solution would benefit from more data, so Holger has been gathering levelling and GNSS data from Poland, Germany and Russia. The plan is to have the data ready by fall 2020 and the new solution in 2021. There are also discrepancies in vertical and horizontal movements' reference frames, as the former is in ITRF2014 and the latter in IGS08.

### 4. Outreach

Maaria Nordman is now assistant professor at Aalto University in Finland. She informed us about the research and teaching possibilities at Aalto.

- Maaria Nordman: "Geoinformatics research and teaching at Aalto University, Finland"

### 5. Gravimetry

There were six presentations:

- Maxime Mouyen, Philippe Steer, Kuo-Jen Chang, Nicolas Le Moigne, Cheinway Hwang, Wen-Chi Hsieh, Louise Jeandet, Laurent Longuevergne, Ching-Chung Cheng, Jean-Paul Boy & Frédéric Masson: "Quantifying sediment mass redistribution from joint time-lapse gravimetry and photogrammetry surveys"
- Mirjam Bilker-Koivula, Jaakko Mäkinen, Hannu Ruotsalainen, Jyri Näränen & Timo Saari: "Reprocessed and new absolute gravity time series in Finland"
- Andreas Engfeldt: "RG 2000 – its realization in 2019"
- Hannu Ruotsalainen (via Skype), Mirjam Bilker-Koivula & Jaakko Mäkinen: "Relative gravimeter calibration in changing gravity field"

- Maxime Mouyen & Magnus Våge: “Trying deep-learning approaches to disentangle SG time series”
- Andreas Engfeldt: “On FG5/FG5X orientation and verticalization”

After that there was the status report of the absolute gravity project by Per-Anders Olsson.

Comparing to minutes of the last year it can be said that:

- The Finnish AG-paper by Mirjam Bilker-Koivula is still being prepared for the resubmission.
- Work is going on with a new publication, investigating the Baltic AG stations deeper. First author tbd.
- As previous year, there was discussion about data storage and databases. First of all, the data in the NKG database should be updated, as now the data ends in 2015. The data should be raw data like drop files, project files, \*.fg5 files etc. So, everyone is now encouraged to send their data to Andreas Engfeldt (LM) who is managing this database. Secondly, all owners of AG data were encouraged to submit their data, preferably also raw data/drop files, to the AGrav database.
- There was some news in the International Gravity Reference System (IGRS) realization. Metsähovi, Onsala and Mårtsbo have been suggested as candidates for the IGRF, so far. There will be a meeting in autumn, Mirjam will participate.

It was noted that the work with repeated AG observations in Fennoscandia is proceeding well now. DTU, LM, and FGI observed at many stations in their countries last year. In Finland several new AG stations have also been built on the new Finnref stations. The instrument of Kartverket/Ås broke down (laser) in 2019 and has not been repaired. There is unfortunately no knowledge of when the university would have the money to get it repaired.

Last year it was decided “that a Nordic comparison of absolute gravimeters should be arranged at Onsala. With the Finnish instrument, FG5X-221, participating there will also be an official link to the international key comparisons. LM and Chalmers (in co-operation) will arrange this.” In addition to last year’s pondering it was decided that the comparison should take place in May-June 2021. The interest in participation for other than NKG countries will be asked.

There was also a short report from Andreas Engfeldt and Jaakko Mäkinen: “2020 status of the land uplift gravity lines publications”. The publication is proceeding.

## **6. National/Institute reports**

National/institutional reports were given by

- Iceland, Guðmundur Valsson, LMI
- Sweden, Andreas Engfeldt, Lantmäteriet and Maxime Moyon, OSO
- Finland, Mirjam Bilker-Koivula, FGI
- Denmark, SDFE and DTU, Gabriel Strykowski, DTU
- Lithuania, Eimuntas Parseliunas, VGTU
- Estonia, Andres Rüdja, Maa-amet
- Latvia, Madara Znotiņa and Vents Zuševics, LGIA
- Norway, Ove Omang, Kartverket

## **7. Business matters**

- The NKG website has improved a lot and the chair of the working group is responsible for the contents of the working group subpages.
- It was decided that freelists.org mailing list will be tested. That way everyone is responsible for their own participation, change of address etc. and the chair does not have to worry about keeping the list up-to-date. It was agreed that the system will be used two years in parallel with the current, inherited mailing list system.
- The presentations of the working group meeting will be available for two weeks on the Lantmäteriets server. The chair will distribute the link.
- The system for combining national reports from two working groups will be tested also next year.

## **8. Closing of the meeting**

For the WGCEO, Sweden will be the host of the next working group meeting. The meeting can take place in Lantmäteriet or at University of Gävle. WGFHSG will join us in Gävle.

The chair thanked to local organizing committee for their hospitality and closed the meeting.