



NORDISKA KOMMISSIONEN FÖR GEODESI

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MINUTES

71st NKG PRESIDIUM MEETING

Time: 13 June 2018
Place: Skype

Item 1) Opening of the meeting

Niels welcomed us all to the meeting.

Item 2) Approval of the agenda

The agenda was approved

Item 3) Discussions on our Focus areas, future working groups and next steps

Per-Erik has continued our work regarding our focus areas to also include three possible organisational schemas. He presented the proposals, see appendix A, and we focused the meeting to discuss this. The three proposals are different in its set-up and has its strengths and weaknesses. The discussion focused on alternatives 1 and 3 and the Presidium could not agree on which alternative that is the most suitable for NKG at this stage. It is important that we are clear on our focus areas, what we want to achieve and then establish an organisation that support that.

One of our key areas in the future concerns on how to ensure that our academia and science institutes are involved in NKG. We need to encourage them even more to participate to be a natural part of NKG. In Denmark the situation is that there is an agreement between SDFE and DTU Space including money transfer to ensure that DTU Space can be involved. This is one way of solving hinders for universities to participate.

Concerning on how to ensure that NKG to be even more efficient, Norway suggested again that we need to reconsider how the Presidium meets and interacts. Per-Erik believes that we should meet more often. He also strongly believes that there should be a forum where only the NMCAs meet.

Matthew pointed out that we have missed to include the suggestion from the Geodynamic working group on having more focus on Earth observations. This was presented at the past meeting.

Another issue is if the current NKG By-laws justify change of NKG structure so close to the General Assembly but the Presidium agreed that we need to be flexible and if we take ownership of the eventual changes than we should be able also to accept them.



It was decided, as a way forward, that we continue to work with the alternatives one and three and that we to the next meeting summaries the strengths and weaknesses in these two alternatives. Niels and Jan will also look on this but focusing on how to include science and academia into NKG.

Item 4) NKG General Assembly (All)

Markku informed that the planning of GA is progressing. Registration is open and the scientific committee is working.

Item 5) Storchefsmötet

There is an agenda item at the upcoming meeting regarding NKG and geodesy. We discussed what could be included and decided that we should focus on outcome from the 8th UNGGIM meeting that is to be held in New York in August.

Item 6) Next meeting of the Presidium (All)

23-24 august, Gardemoen, Norway

Current order; Iceland – Denmark – Norway – Sweden – Finland



NORDISKA KOMMISSIONEN FÖR GEODESI

Present:

Denmark: Sören Fauerholm Christensen, SDFE
Niels Andersen, DTU Space

Finland: Markku Poutanen, NLS
Pasi Häkli, NLS

Norway: Per Erik Opseth, Kartverket
Torbjörn Norbech, Kartverket
Matthew Simpson, Kartverket

Sweden: Jan Johansson, Chalmers
Jonas Ågren, LM
Mikael Lilje, LM



NKG structure 2018-2022

Focus areas for coming period

Dynamic Reference Frame

Vision / goal:

Develop a realization of ITRF for the Nordic countries based on GNSS time series and possibly other space geodesic techniques. Make sure that future updates of the reference frame can be done on regularly basis.
Clarify the concepts and describe the merits of static, semi-dynamic and dynamic reference frames, including the "two frame concept" where ITRF and national realizations of ETRS89 are used in parallel for various applications.
Evaluate the different concepts as basis for our geospatial data sets and for various positioning and surveying techniques.

Add something from the application and use? Add something on legislation? If impossible – what are the alternatives?

Keywords:

Milestones:

1. Test of InSAR as a source for local deformations, and evaluate if local deformations are relevant in the velocity model.
2. Testing algorithms that combines GNSS timeseries, GIA data and maybe InSAR to carry out a high-resolution Nordic deformation model.
3. Setting up a Nordic calculation center that continuously updates the reference frame based on the Nordic deformation model (automated process).
4. Figure out: How to organize the geospatial data to make an efficient upgrade of the reference frame when needed.
5. Figure out: How to deal with dynamic cadaster data? What about legislation?
6. Outreach work – setting up a common campaign to convince the owners of the geospatial data.
7. Finalizing the Icelandic case study and draw conclusions.
8. Define a new test area (outside Iceland) and set up a full-scale test of a dynamic GIS.



Future Height System

Vision

1) In the intermediate future (5-15 years?) we have methods for effective use of our Nordic/Baltic realizations of EVRS in parallel to IHRF and its first realizations through IHRF, both on land and for maritime applications, including the Baltic Sea and other surrounding sea areas

2) We are continuously well aware of the progress on "the Global Height System" and involved in its development. Thereby we are well prepared for its first use and for possible adoption in the future

3) By 202X, we have studied and developed theory and methods to maintain, upgrade or create a modern height system in the Nordic area that is up-to-date w.r.t. the uplift. We have also investigated different alternatives for a future unified Nordic height system theme, taking European and international developments into account (EVRS/EVRF and IHRF/IHRF, respectively).

4) By 202X we have studied and developed methods to utilize new techniques for practical usage of the height system and height determination with or without traditional levelling but without losing the accuracy of levelling

Keywords

height system, gravity, levelling, height determination, EVRS, BSCG2000, IHRF/IHRF

Milestones

1/2) Develop a common Nordic realization of IHRF (International Height Reference Frame) and derive relations to the existing national height systems (realizations of EVRS with land uplift epoch 2000.0)

- 1) study on capabilities of new techniques and their suitability, accuracy and limitations for height determination
- 2) apply improved land uplift model (3D) and geoid model
- 3) Choose and define the basis of new Nordic height system
- 4) choose and develop method(s) for maintenance of the height system
- 5) develop practical methods to utilize new technique for height determination applying the new Nordic height system

Geoid – 5 mm

Vision and goals

The goal for the NKG cooperation is to support NKG's effort to work towards creation a common Nordic geoid model. The objective is a Nordic geoid model with an **accuracy/uncertainty** of approx. 5 mm (**1 sigma, for the gravimetric geoid model**), which makes it possible to determine accurate heights by use of GNSS.

Keywords

All Nordic countries have in their strategic geodetic infrastructure plan a wish for an accurate geoid.

It is economically interesting to improve the accuracy of the geoid model.

With the improvement of the geoid model, NKG focuses over time to reduce the overall level of need for levelling.

Accurate geoid models are developed through international collaborations.

Milestones

1. Gravity data from the common Nordic and Baltic FAMOS project (and its extended projects) covering the sea areas between Finland and Sweden/Sweden and Denmark will be available for geoid computation
2. Determined research on how data already collected (during many years) can improve the present geoid
3. Based on 1 and 2 define the 'gap' for reaching a 5 mm geoid. Create a plan for additional **observations** and **research methodological improvements** in order to reach 5 mm.



The Nordic contribution to GGRF

Vision / goal:

Achieve a Nordic robust level of competence for the operations of the three observatories, a VLBI correlator and the analysis of the data from the Nordic fundamental sites.

Keywords:

Milestones:

1. Achieve long-term committed financing of the three sites with necessary staff.
2. Establish a common team to take care of the operations.
3. Common financing of a Nordic VLBI correlator –
4. Setting up a common Nordic analysis center for IVS and ILRS, based on our common resources.
5. Continues active participation in the UNGGIM subcommittee on Geodesy.

Future Positioning Services and its applications

Vision / Goals:

- *The respective national geodetic infrastructures prepared to support autonomous vehicles and other high demanding applications.*
- *A clear view of future positioning services and their demand on the national (or Nordic) geodetic infrastructure*
- *A Nordic platform for testing and verifying Galileo and EGNOS positioning services and other GNSS developments.*
- *Ability to handle low to high accuracy services*

Keywords:

Services, Professional users, mass market, applications, accuracy, GNSS, Galileo, Geodetic infrastructure, PPP

Milestones:

White paper on future positioning services in 2019. To be presented to DG Joint project with car industry to define future demands on the geodetic infrastructure.



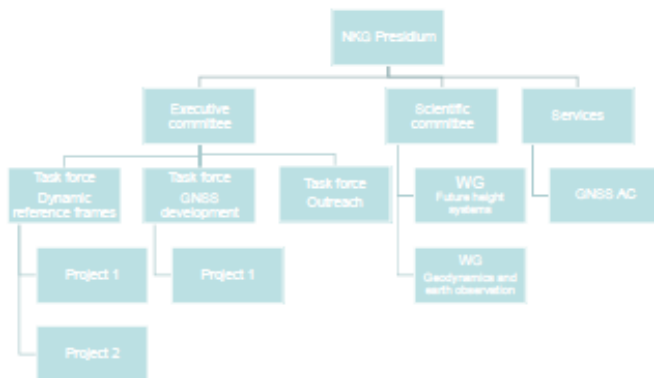
GNSS Security - Spoofing / Jamming

Responsibilities / Possibilities:

- Capability of Nordic NMA's to help government authorities to detect Jamming & spoofing
- Awareness and capability rising among the government authorities
- 24/7 online detection through national reference GNSS network (FinnRef, SWEPOS....)
- possibility to set detectors in import and HUBs (airports etc.)

Keywords:

Alt 1: NKG structure 2018-2022





Alt 1: NKG structure 2018-2022

Presidium members (twice a year)

- 3 Task force representatives
- Project managers
- 2 Working group chairs
- Services representatives
- Observers (Baltic countries and Faroe Islands)
- 5 representatives from the NMCAs (preferable the managers)
- 5 representatives from the universities (1 per country)

Scientific committee (?)

- 2 Working group chairs

Services (?)

- Service representatives

Executive committee (regularly)

- Managers
- Task force representatives
- Project managers

Alt 2: NKG structure 2018-2022

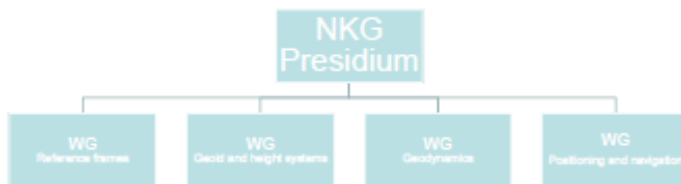


Presidium members

- 2 Working group chairs
- 2 Programme owners
- Optionally: project managers
- 5 representatives from the NMCAs (preferable the managers)
- 5 representatives from the universities (1 per country)
- Observers (Baltic countries and Faroe Islands)



Alt 3: NKG structure 2018-2022



Presidium members (twice a year)

- 4 working group chairs
- 1 DRF leader
- Observers (Baltic countries and Faroe Islands)
- 5 representatives from the NMCAs (preferable the managers)
- 5 representatives from the universities (1 per country)

Proposal for Presidium members

Denmark

Finland

Iceland

Norway

Sweden