



NORDISKA KOMMISSIONEN FÖR GEODESI

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MINUTES

55th NKG PRESIDIUM MEETING

Ny-Ålesund, Norway
31st March and 2nd April, 2014

Item 1) Opening of the meeting

Niels opened the meeting and especially thanked our Norwegian colleagues for inviting us to Ny-Ålesund and the program that has been prepared for us.

Due to changes at Geodatastyrelsen, Lola was replaced by Kristian Keller at this meeting. It is not decided if Kristian will be the representative of Geodatastyrelsen or not in the future. Even though Kristian is well known for us Nordic geodesist, he introduced himself to the members of the Presidium. He is of course most welcome to participate at this meeting and, hopefully, as the representative of Geodatastyrelsen. We all sent our regards to Lola through Kristian. He also read a message to all of us from Lola wishing us a successful meeting and future of NKG.

Torbjørn told us some of the history of Ny-Ålesund as an introduction. We were later presented with some more information by representative of the company King Bay. The first visitors came to Ny-Ålesund during the 17th century but activities connected to mining started about 100 years ago. The mining stopped in 1962 due to an accident. The geodetic observatory started in 1993 and is currently undergoing an upgrade with new instruments and new location.

Item 2) Approval of the agenda (All)

The agenda was approved even though slight changes in the order the agenda items were discussed. Item 7 was e.g discussed first of all items.

Item 3) Approval of the Minutes from NKG Presidium meeting No 54 (All)

The minutes were approved after some minor changes, mainly grammatical errors. Minutes from last meetings have not been uploaded to the website due to the problems we have experienced with the NKG Website.

Action: Mikael to upload the minutes on the NKG website



Item 4) Brief reports on financial and organising issues at the Nordic National Mapping Authorities (All)

Denmark:

Geodatastyrelsen: There have been changes on the management level at GST. This is one reason why Lola now has been replaced. The new managers are not so familiar with geodesy and mapping and there is a need to educate them so that they understand the challenges for GST. On the more academic level, GST is focusing on the new nationwide laser scanned height model to be produced during 2014 – 2015. Geodatastyrelsen is using own automatic QC-routines. The Danish Height Model (surface, incl. buildings) will be used for a Mind-craft server. Mind-Craft is an internet game for 8-15 years kids where they can build (and destroy) the landscape and towns etc. Note the real world is made of 1 by 1 by 1 m blocks only (very low resolution), however millions are playing the game worldwide. A new geoid was published in 2013 with an accuracy less than 1 cm RMS. It was made by DTU Space (Rene Forsberg) but in co-operation with GST using up to 700 GPS-levelled bench marks. In 2014 GST will publish a software for ITRFxx-IGSxx-ETRS89 (and combinations with various epochs) transformations called GNSS-trans. In co-operation with Ole B. Andersen (DTU Space), GST is currently working on a vertical reference at sea, similar to the BLAST both in Denmark and for Greenland. GST is also working on automatic Bernese computation with some help from Lotti Jivall, LM.

DTU Space: Over the last period there has been intensive discussions regarding funding issues. A better balance in economy is needed and a cut of 20 % has been discussed. This has resulted in a discussion concerning that 15-20 positions were at risk at DTU Space. When finally a balanced budget was reached it was unfortunate that Karsten Engsager had to retire. The NKG Presidium recognises the importance that Karsten has had in the Nordic geodesy over his carrier. DTU is currently focusing on UAVs and drones as a platform on which we can put sensors on. The technology, sensors and the science connected to them and the observables are on focus. The idea is that the drones are to be used on Greenland and the application depends on what sensors you put on the platform.

Finland

Finnish geodetic institute: FGI will most probably merge with the National Land Survey in the beginning of 2015. FGI will most probably move “as is”, e.g. FGI will create a division of its own at NLS. The current tasks and structure that FGI has will remain. FGI foresee budget cuts of about 30 % but expect that when merging with NLS, most cuts will be absorbed in the organisation. A new department on SDI services are also planned within the merged organisation and its research Centre. The merging would mean that research is included in NLS as at Kartverket (Norway) and Lantmäteriet (Sweden) but opposite concerning how Denmark moved some years ago.



FGI has upgraded last year its absolute gravimeter FG5-221. The new superconducting gravimeter was installed in Metsähovi in February 2014. The new SLR telescope (0.5 m) was ordered in January this year with delivery in 2015 but with the new observatory building this year. FinnRef has been upgraded to 19 stations. A new national navigation service on the 0.5 m accuracy level has been introduced in Finland using the Geo++ software. The service is free and open to everyone following the open data policy in Finland. Negotiation is going on for the new VLBI telescope. Originally, there is a five year plan including budget for Metsähovi but now after three years the Ministry is asking for more explanations.

Norway

Kartverket is working on a new strategy and Per-Erik is the project manager. Beside that he is currently also focusing on the developments of the Geodetic Observatory at Ny-Ålesund. This means that he is temporarily on leave from the role as Director of Geodesy until the summer. At Kartverket they are focussing on the Geosat software package (VLBI, SLR and GNSS combined solution to be possible at the end of 2014). They are also focusing on sea level monitoring and have started a co-operation with all parties in Norway. Space weather is of great interest and importance. For the ionosphere monitoring, Kartverket has installed ten receivers with 100 Hz in Northern Norway. Another major focus is the work with the UN resolution (see item 7).

Sweden

Lantmäteriet: It is very much business as usual even though they can foresee economic issues. The national network-RTK service celebrates ten year this year. Currently the service has some 2500 paying users. The SWEPOS network is densified with some 35-40 stations per year. Lantmäteriet is focussing on gravity (both absolute and relative) measurements. This year a new Scintrex CG-5 is bought to be used for gradient measurement during absolute measurements but also during relative measurements, mainly in the mountainous area. The shift from local coordinate and height systems at the local authorities to SWEREF 99/RH 2000 is progressing. Almost all local authorities have changed to SWEREF 99 and more than half of them to RH 2000. However, Lantmäteriet still expects work for a number of years concerning this.

The work of finding the successor of Professor Lars Sjöberg is progressing according to plan. Three candidates have been identified.

Onsala: The new VLBI Twin telescope is to be built in 2014-16. Locations are now decided! The Onsala 20 m telescope can be used for Geo-VLBI 50 days/yr. Complementary with the new VLBI station are some additional GNSS installations that will be made together with Lantmäteriet. Two new GNSS based tide gauges, based on a technique from a doctoral thesis (reflections on the surface), are also planned to be installed.



Item 5) NKG General Assembly 2014, 1-4 September (Jan and Mikael)

Please check www.lantmateriet.se/nkg2014.

A report was given from the local and scientific Committee concerning e.g.;
The rough programme is as follows;

Monday

- Opening session (including key note speaker (addressing climate issues), national and WG reports
- Ice breaker on behalf of Gothenburg City

Tuesday

- Full day with lunch and two coffee breaks
- Sessions Geoid, Heights and Geodynamics
- Posters
- Evening splinter groups meetings

Wednesday

- Full day with lunch and two coffee breaks
- Joint seminar with NNF and RNN
- Posters
- NKG dinner (possibly boat trip)

Thursday

- Half day sessions with coffee break and lunch
- Reference frames and infrastructure
- Posters
- Closing sessions

In parallel there are smaller meeting rooms available. The meeting decided that we needed two smaller meeting rooms.

The deadline for abstracts is set very early! The reason was to give the working group chairs as well as the scientific committee some time to work on the technical programme. It is up to the scientific committee to change the deadline if necessary.

A presidium meeting prior the GA was decided to be held late afternoon/evening on Sunday the 31st August at the institution. One meeting will also be needed directly after the General Assembly for constitute.

There is a need for a resolution committee and each country is asked to nominate one candidate, preferably to Mikael at the latest the 30 April.

For abstract and registration, please see the website



The meeting decided that full registration includes lunch, coffee, ice-breaker, NKG dinner and would cost 2000 SEK. Student will be offered the same but for the fee of 1000 SEK. For those attending the NKG/NNF/RNN-seminar, the cost will be 1000 SEK and covers Wednesday and Thursday (all meals and lecturers). The registration fee will be invoiced. It will not be possible to pay on site. Last day for registration will be 1st of July.

For those who are interested there will be a possibility to arrange excursion on either Thursday evening or Friday. The excursion could go to RUAG Space or Onsala Space Observatory

The joint seminar is important also for the coming period of NKG. We should try to make sure that we have some good outcomes from the joint seminar, questions that we should work on in the coming years. The other sessions are of course also of importance. The working group chairs will be responsible to summarize the sessions to make sure we do get the most valuable conclusions. The scientific committee is responsible to make sure this will happen.

Since earlier we have decided that respective countries guarantee a smaller amount of money to cover any loss if needed.

We agreed that we are aiming on a proceeding. The aim will be to publish the PowerPoints both online and in the proceedings if possible. However, the printed proceedings will most probably be in black and white to save some costs. We will probably not ask for full papers unless someone would like to write one. We will however ask for national reports, working group reports, abstracts, summaries, pwp etc and print that.

It is a challenge both to attract students to present as well as to have presentations also not too scientific but having some more overview and outreach presentations. The presidium discussed to include a NKG Student Prize for both best poster and best presentation. The scientific committee is to discuss and develop the idea.

ACTION: The registration fees were decided to be 2000 SEK for normal participants and 1000 SEK for seminar participants as well as student. LOC is to set up the registration form online as soon as possible.

ACTION: The General Assembly will be followed by the publication of a proceeding as soon as possible after the General Assembly. The Scientific Committee to coordinate the contributions from the presenters. Lantmäteriet responsible to edit and print the publication.

ACTION: The NKG Student Prize to be defined by the Scientific Committee as soon as possible. No later than 1st of May and presented on the NKG GA-website.



ACTION: Participants in the Resolution Committee should be sent to Mikael no later than 30th of April.

Item 6) NKG 2014 and beyond (All)

We reviewed the current period in order to strengthen NKG for the coming period. Mikael and Niels had prepared a presentation in order to start a discussion.

The presidium agreed to introduce some new elements as NKG Projects. The main reason was to use the project form to agree between the mapping authorities that a certain task was important and should be given priority. The working groups were to be encouraged to use the project form. A project was not allowed to start before the Presidium had given approval and the projects were supposed to be discussed and followed at every Presidium meeting

Projects work for concrete and limited tasks when the project participants and their organisations have a shared interest. The project form has forced us to thoroughly think through the scope, timetable and necessary resources in advance before we start new work items which have been good. The quality of our joint efforts is high. The mapping authorities guaranteed that a NKG project has high priority also "back home".

However and mainly due to the fact that the Presidium has not been active enough, it has taken too long time between project proposals to project start. The idea with project has actually meant that the working groups have put too much focus on the projects. Much time has been spent on project administration. The scientific discussions at working group meetings have been limited. The focus on projects has somewhat limited the work and discussions within the working groups to be more project meetings and not working group meetings. The freedom of the working groups has perhaps been limited by the projects. We should not underestimate the value of networking through the working group activities. There is a risk that universities will not see NKG as a platform for discussions or research presentations if we are too much project oriented. NKG has traditionally been built on best effort and shared interest. A project with strict deadline is too strict. NKG has not been ready for this.

The meeting agreed that the structure with the current working groups is good enough. There is no emerging need to change. Most important is to find working group chairs that takes the lead and is active.

The current project structure has taken its time to implement. Focus during the last period has been on these projects. The working groups have tried to adapt even though the Presidium has not responded as good. The working groups have however reported that they feel that the agenda at the annual working group meetings as well as focus have been limited. There is a need to find a better balance in the working group between project reports and discussion and the more academic discussions. It is also worth mentioning that the scientific week on Iceland was a success as well as the Autumn School in Finland!



Mikael and Niels suggested that the Presidium decides on a number of **focus areas**. We encourage the working groups use these to define its scope and actions as well as encouraging more discussions within the working groups. The number of focus areas should not be more than five and are something that the Presidium should focus on and to set up an agenda from. This could be the NKG Road Map. The working groups then set up project(s) when appropriate. We shall of course still encourage projects because there are advantages with this form of work.

Examples on focus areas could be

- International cooperation
- Land uplift
- GNSS modernisation and development
- Geoid
- Geodetic Infrastructure and UN resolution road map
- Education
- Reference Frame and System
- Network-RTK services
- Positioning and Surveying Techniques including integrated sensors.
- Fund raising activities

Niels will address this in his opening speech at the General Assembly.

ACTION: The Presidium decided that we will keep the current working group structure also for the common period 2014-2018 and focus even harder to find suitable and active working group chairs.

ACTION: The Presidium decided to work on a NKG Road Map and include NKG Focus Areas. Niels is to present at the opening session of the NKG General Assembly.

Item 7) UN-GGIM and GIAC (Anne)

Norway (through Kartverket) is co-chairing the Working Group on the Global Geodetic Reference Frame for Sustainable Development together with Australia (through GI Australia). The working group is a result from the UN initiative UN-GGIM. From the Nordic Area currently only Sweden is in the working group but Finland is also in the process of nominating FGI and Markku.

Anne went through the power point *"How Geodesy is strengthening the"*. The presentation is prepared by the working group and can be used to inform our respective national foreign department to help them to prepare for the UN meeting. The main message is that we need global cooperation and contribution to develop the geodetic infrastructure to guarantee the existence of a global geodetic reference frame. The resolution is to be tabled in June and hopefully adopted by General Assembly in August. The resolution is on a no-cost-basis and purely awareness on the best



effort etc. on global geodetic issues. A draft version of the resolution exists. A first Newsletter from UN-GGIM Working Group is also prepared and handed out at the Presidium meeting.

A meeting of the working group is planned to take place the 2nd of May in Vienna in conjunction to the EGU.

The lengthy discussion at the Presidium meeting discussed on how can we include other stakeholders outside the Geodesy community to understand the importance and have those supporting us? That would strengthen our case! More input and support from the climate change area would be useful and use them to strengthen our arguments and also discuss more on the climate change adaption.

The discussion also covered the need of a resolution since the best effort solution so far has taken us very far. How can we still encourage best efforts? It is a fact that we have come far with the development of e.g. GNSS, VLBI, Doris, and others. Would a resolution have had helped us or not? Norway is convinced that the resolution definitely would have helped them in the discussions regarding Ny-Ålesund. The decision makers in the countries could hopefully understand that this is important since UN hopefully accept the resolution.

ACTION: NKG is of course supportive to the resolution and what is aiming. NKG is willing to write a support letter if necessary. Norway is to decide and draft the letter.

ACTION: Norway to report back to the Presidium regarding the inclusion of the research aspects as well as stakeholder perspective in the work of the working group.

ACTION: Norway to inform the respective countries regarding the meetings with the UN-missions in New York in May.

Item 8) Reports from the working groups

a) Geodetic infrastructure (Per)

No information from Per.

b) Geodynamics (Dagny/Matthew)

Owe reported on the progress of the working group. The working group had a meeting in Gävle in March. Main activities that were discussed were absolute gravity measurements and GIA activities. It is mainly Holger Steffen and Matthew Simpson that is working on the GIA model, to be used for other applications. The current plan is to publish a model by the 1st of May. Concerning the absolute gravity activities, see item 9 further down. Good news is that the Germans are showing some more interest in the Nordic area and are interested in starting doing more absolute gravity measurements but mainly in Denmark and



southern Sweden. They are currently applying for funds for a major project doing absolute gravity measurements.

c) Geoid and height systems (Jonas)

The Working Group had a meeting together with Geodynamics in March in Gävle. The working group organised two workshops, one on the NKG Geoid 2014 and the other on "Review of the current and near-future levelling technology". The WG also discussed the FAMOS project. More information, see item 9 below.

d) Reference frames, positioning and navigation (Pasi)

Markku presented on behalf of Pasi. The working group has had no meeting since the Science week on Iceland last year but a meeting is planned the 26-27th May in Copenhagen. The focus of the working group is on the projects but limited time and resources lately unfortunately.

Item 9) Reports from the projects

a) Computation of the NKG2014 geoid model (Jonas)

The schedule of the NKG2014 geoid project has now changed several times. Jonas presented a new schedule where 30 May 2014 is the deadline to distribute all data to the computation centres as well as distributing the specifications for the computation phase. In August 2014 a PowerPoint presentation will be prepared for the general assembly meaning that the computation centres will have time to compute a quick and dirty solution. After the general Assembly the Computation phase continues and ends in November 2014 with computation workshop in Estonia. A joint presentation is then planned to the IUGG in Prague. The project is dependent of the NKG 2008 transformation to be developed by the working group on Reference frames, positioning and navigation.

b) Investigation of the requirements for a future 5 mm (quasi) geoid model. (Jonas)

So far only Lars and Jonas have been active in this project. Their intention is that the project will write a scientific paper with co-authors. It is expected that a few of the authors do the work while others probably will not contribute. Since the meeting in Illulissat, Jonas and Lars have worked on the influence of errors in the DEM (mostly long wavelength). This was presented at the IAG meeting in Potsdam (oral presentation). An oral presentation will be given at the NKG General Assembly in September 2014.

c) Review of current and near-future levelling technology (Jonas)

A workshop was organised in connection with the working group meeting in Gävle 12 March 2014. Per-Ola, Olav, Casper, Gudmundur and Veikko have now written about levelling from their respective national perspectives. A contribution from Jaakko is expected (according to Veikko). To the workshop the Per-Ola Eriksson had compiled a draft version of the report (~30 pages), which was discussed at the workshop. It was decided that the report will be published as a report in Lantmäteriet's series (LM-Rapport).



Per-Ola has since the meeting reworked the document and sent it out to the project participants for comments. A deadline was agreed to the 1 May is the last day for comments from the project participants. Per-Ola will then produce the final version.

The presidium discussed the project and thought that it would be a good idea to continue the project after the General Assembly and discuss on how to maintain a height system and with what technique.

d) Empirical land uplift modelling (Jonas)

Lithuania has now delivered levelling data to Olav but Estonia has not. However, Tarmo Kall has compiled the data (and also published a paper in Tectonophysics). Holger Steffen is ready to deliver a (underlying) GIA model together with his group. A new deadline is set to 1st of May for Estonian levelling and GIA model. Olav and Jonas will then compute a new uplift model (small workshop with only Jonas and Olav, if needed). The same method as for NKG2005LU will be used with the difference that we have more levelling and a new GNSS-solution (Halfdan's from last year). It was also decided to call the model:
NKG2014_Up_test_ABS/_APP

e) ITRF – ETRS 89 Transformations. (Pasi)

The final NKG2008 campaign parameters have not been published yet (they exist). All data and parameters should be verified and the plan is to publish the transformation before the General Assembly. Goals and plans were too optimistic and too dependent on other projects. These goals are still valid and the hope is to continue them also in the coming 4-year period.

f) NKG GNSS AC (Pasi)

The project is delayed mainly due to the new Bernese version (5.0 -> 5.2). This meant that more work and testing was needed than expected. First benchmark tests shows that the results from different analysis centres are equal. Routines are more or less ready and EPN compatible. During the coming WG meeting the remaining issues are planned to be solved and get the NKG analysis centre operational. Recomputing the whole data history will be discussed at the WG meeting.

g) NCGN – Nordic Combined Geodetic Network (Markku)

The project is focusing on understanding the Sea Level Variation in the Fennoscandia area. A student has prepared a draft database on the NKG web page as a part of his diploma work and this is presented as a publication in Solid Earth; referee comments 03/2014. The next things to be done in the project is mainly to update all information on database and add new material and links.

h) Absolute Gravity Measurements in Fennoscandia (Dagny)



Gravity observations from absolute gravity campaigns have been delivered to Lantmäteriet. A backup will also be saved in Finland.

Item 10) EUREF (Markku)

A EUREF Technical Working Group meeting was arranged a few weeks ago in Gävle, Sweden. One of the urgent things to be discussed was the preparation of the Euref symposium in Vilnius in June. Other issues that was discussed was the relationship between the International Federation of Surveyors (FIG) and mainly it FIG Commission 5 (positioning and measurement) since Mikael is chairing this commission. The Multi-GNSS timescale differences between GPS, Beidou, Glonass and Galileo was also discussed and this is also on the top of the agenda at the ICG-meetings. ICG is the International Committee on GNSS that is under the umbrella of UN-OOSA. The TEQ-software was discussed and the fact that it will not be developed for RINEX 3. New software has been developed in Europe for Rinex 3.x. There was a lengthy discussion at the TWG meeting regarding EPOS (European Plate Observing System). This needs also to be discussed more within NKG.

ACTION: Markku to present on EPOS and its relationship with NKG at the next Presidium meeting

Item 11) NKG Web site (Markku and Niels)

The NKG web site has not been working for a long time. We need to find a more permanent solution for the NKG Website. The major drawbacks have been the maintenance, back-ups and updating from external partners. There is a need to find a more stable solution. We need to have a webpage where more than Markku (or someone at the FGI) can update. This would make it more flexible and easier to keep updated. There is a need that the NKG webpage is used both externally and internally (information, agenda etc. within a working group). We could e.g. use it more as a data warehouse in the future.

Markku suggest to the Presidium to arrange a new web site that is easily organised and maintained. The site would have the most sufficient and needed functionalities. The editor would be someone at FGI. This solution would not be dependent on the internal FGI IT issues that we have been suffering from so far but we are still in the hands of that all updates are made through a webmaster at FGI.

ACTION: Markku to set up the NKG web page in a more simple IT-system, a web page maintained by FGI. A new version is to be launched by April, 2014.

ACTION: In the next period of the Presidium we will look into the need of a NKG webpage and its functionalities.

Item 12) Other Business (All)



Kristian asked about how NKG and the countries are working with ISO standards and especially the proposal on making ITRS to an ISO standard. No common efforts have been made so far.

Jan reminded us that NKG EPN Analysis Centre started in 1996 after a proposal in 1994 to be an IGS Analysis Centre. This is 20 years ago. Soon we are having a NKG GNSS AC.

Item 13) Next meeting of the Presidium (All)

56th Presidium Meeting; General Assembly, 31st of August, Gothenburg, Sweden



NORDISKA KOMMISSIONEN FÖR GEODESI

Present:

Denmark: Niels Andersen, DTU Space (Chair)
Kristian Keller, GS

Finland: Markku Poutanen, FGI

Norway: Torbjørn Nørbech, Kartverket
Per Erik Opseth, Kartverket
Anne Jørgensen, Kartverket
Ove Omang, Kartverket

Sweden: Mikael Lilje, LM (Secretary)
Jan Johansson, Chalmers
Jonas Ågren, LM

Apologies

Denmark Per Knudsen, DTU Space
Lola Bahl, GS

Finland: Jarkko Koskinen, FGI
Pasi Häkli, FGI

Iceland Thorarinn Sigurdsson, LMI
Gudmundur Valsson, LMI

Norway: Dagny Lysaker, Kartverket