# NORDISKA KOMMISSIONEN FÖR GEODESI

**Chairman**
NIELS ANDERSEN
DTU Space
National Space Institute
Juliane Maries vej 30
Building Rockefeller, room 264
DK-2100 KØBENHAVN
Danmark

**Secretary**
MIKAEL LILJE
Lantmäteriet
Geodesienheten
SE-801 82 GÄVLE
SVERIGE


## Project within the Nordic Commission of Geodesy

## *ITRS-ETRS89 transformations*

## Project

Version: June 29, 2012
Accepted by the Presidium: January 17, 2012

***Aim/motivation***

Need for an accurate connection between ITRS and national ETRS89 realizations for maintenance of national reference frames (continuation of the work done in previous WG of Positioning and Reference Frames). Current transformation recommended by EUREF is not sufficient for cm-level transformations in most Nordic countries due to post-glacial rebound. Previous WG has produced transformation procedures for ITRF2000 and ITRF2005 with intraplate model NKG_RF03vel but future ITRFs and models have not been considered so far.

***Outcome /Deliverable***

1. Finalize the transformation part of NKG2008 campaign (from the previous WG) including constraining of the solution to ITRFyy and review of possible transformation procedures that take into account post-glacial rebound/plate tectonics in Nordic area to ensure accurate connection between global and national reference frames. Outcome: paper/report
2. Continuation:
    a. new transformations for ITRF20yy with coordinates based on time series of GNSS stations (dependent on project NKG AC)
    b. new intraplate model (dependent on WGG)

***Working Groups and Officers Involved***

Working group of Reference Frames, Positioning and Navigation (WGRFPN).

Project leader: Pasi Häkli
Participants:

- DK: Karsten Engsager (to be confirmed)
- EE: Karin Kollo, Priit Pihlak
- FI: Ulla Kallio
- IS: Guðmundur Valsson
- LV: Janis Kaminskis
- LT: Eimuntas Paršeliūnas
- NO: Torbjørn Nørbech
- SE: Lotti Jivall, Martin Lidberg, Anders Alfredsson

**Chairman**
NIELS ANDERSEN
DTU Space
National Space Institute
Juliane Maries vej 30
Building Rockefeller, room 264
DK-2100 KØBENHAVN
Danmark

**Secretary**
MIKAEL LILJE
Lantmäteriet
Geodesienheten
SE-801 82 GÄVLE
SVERIGE

***Milestones, Completion Dates***

| Activity | Short description | Responsible | Completed |
|---|---|---|---|
| 1 | Project preparation | Pasi Häkli | |
| 2 | NKG2008<br>• constraining studies<br>• final solution (and comparison of different methods and software) | Lotti Jivall | October 2012 |
| 3 | NKG2008<br>• final transformation | Pasi Häkli | December 2012 |
| 4 | NKG2008<br>• report/paper including final results | TBD | 2013 |
| 5 | Review of different transformation approaches/procedures<br>• GIA (deformation) models<br>• time series instead of campaign based solutions (dense velocity field)<br>• interpolation techniques<br>• handling of different ITRFs and future models without jumps<br>• ...<br>• outcome: paper | TBD | 2013-2014 |
| 6 | Official NKG transformation using:<br>• time series<br>• (and new intraplate model) | | 2014<br>(after reprocessing in NKG AC project) |
| 7 | Maintenance of national ETRS89 realizations in the Nordic countries<br>• GIA taken into account | | |

***Proposed Meeting Schedule***

At least WG meetings but additional project meetings probably needed as well

***Project Monitoring and Reporting***

Short status reports for the Presidium meetings.

**Chairman**
NIELS ANDERSEN
DTU Space
National Space Institute
Juliane Maries vej 30
Building Rockefeller, room 264
DK-2100 KØBENHAVN
Danmark

**Secretary**
MIKAEL LILJE
Lantmäteriet
Geodesienheten
SE-801 82 GÄVLE
SVERIGE

***Resources required***

| Activity | Short description | Estimation of resources |
|---|---|---|
| 1 | Project preparation | Pasi Häkli: 1-2 days |
| 2 | NKG2008: constraining studies | Lotti Jivall 1-2 weeks<br>Pasi Häkli: 1 week<br>Karin Kollo |
| 3 | NKG2008: final transformation | Pasi Häkli: 1-2 weeks<br>Martin Lidberg<br>Torbjørn Nørbech<br>Karsten Engsager<br>Anders Alfredsson |
| 4 | NKG2008: report/paper | TBD |
| 5 | Review of different transformation approaches/procedures | TBD |
| 6 | Official NKG transformation | TBD |
| 7 | Maintenance of national ETRS89 realizations | |

***Sent in by***
Pasi Häkli