



NGOS - The Nordic Geodetic Observing System

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NGOS

A task force of the Nordic Geodetic Commission (NKG)

The Nordic Geodetic Observing System (NGOS) integrates fundamental geodetic techniques for the long term observation of Earth system parameters

NGOS is a regional implementation and densification of the Global Geodetic Observing System (GGOS).



- Association of Geodesists in the Nordic countries

Established in 1953

prof. Lars Asplund

- triangulation adjustments
- gravity measurements
- precise levelling
- solar eclipse 1954



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General Meeting

every 4th year (2010 next time)

Presidium, Working Groups and Task Forces

on hot issues
annual meetings

NKG Summer School

every 4th year (This year in August on Iceland)

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Present Structure

FIG

Working Groups of today

- Geodynamics
- Geoid Determination
- Height Determination
- Positioning and Reference Systems

Special Project and Task Forces

- Nordic Real-Time Positioning Service
- Nordic Geodetic Observing System
- Digital Elevation Models

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IAG's Global Geodetic Observing System - GGOS

FIG

Provides observations of the three fundamental geodetic observables and their variations

- the Earth's shape
- the Earth's gravity field
- the Earth's rotational motion.

GGOS integrates

- different geodetic techniques
- different models
- different approaches in order to ensure a long-term, precise monitoring of the geodetic observables in agreement with the Integrated Global Observing Strategy (IGOS).

GGOS provides the observational basis to maintain a stable, accurate and global reference frame and in this function is crucial for all Earth observation and many practical applications.

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NGOS / Objectives

FIG

NGOS is a Nordic contribution to GGOS

The Task Force should co-ordinate the design of a Nordic Geodetic Observing System (NGOS) and the Nordic contribution to the Global Observing system(s)

For the Nordic countries, a main focus will be on crustal motion, dynamics of glaciated areas and sea level.

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NGOS / Key Areas to Study

FIG

Glacial dynamics, postglacial rebound

Crustal stability

Global climate change and its consequences

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NGOS / Key Parameters

FIG

Height / height systems

Sea Level

Geodetic position, reference frames

Geopotential and gravity anomalies

Temporal gravity change

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Multi-technique observing sites

FIG



Smögen

- GNSS
- Tide gauge
- Absolute Gravity
- Height

Geodynamics
Postglacial Rebound
Earth structure
Gravity changes
Vertical datums

Onsala

- GNSS
- Tide gauge
- Absolute Gravity
- VLBI
- Height

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Integrating observing techniques

FIG

- NOT just to collect observation techniques at the same location and use the same infrastructure. (Although this is an important part of integration)
- We must also to bring together different observations for common parameter estimation in collocation approach
- Integration means to provide one set of parameters which is consistent and compatible with itself and w.r.t. related parameters (e.g., from other disciplines for interpretations).

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Main contributions of Geodesy to global monitoring

FIG

- Provides the infrastructure and observations to determine and maintain an accurate and stable terrestrial reference frame as the basis for all Earth observations
- Delivers observations of the changes in the geometry and rotation of the solid Earth as well as changes in the Earth's gravity field.

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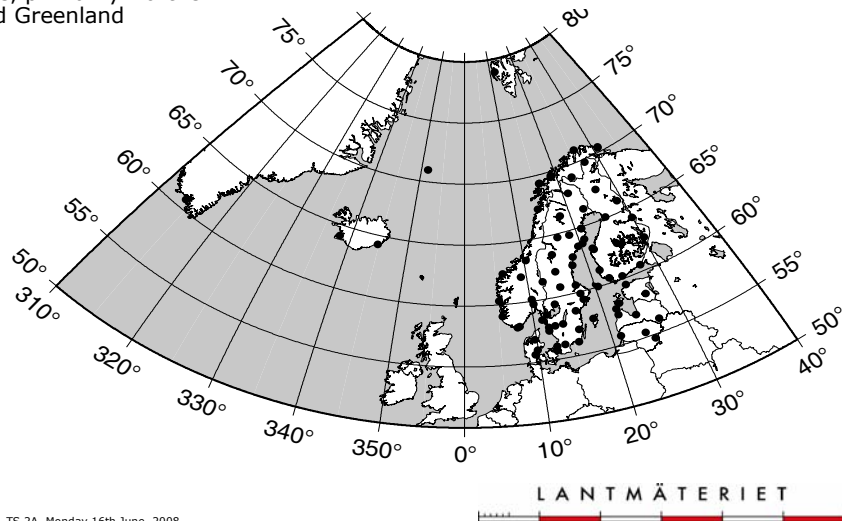
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NGOS / Geographic extent



Formerly and presently ice covered areas of the Northern hemisphere, primarily Northern Europe and Greenland



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NGOS multi technique stations

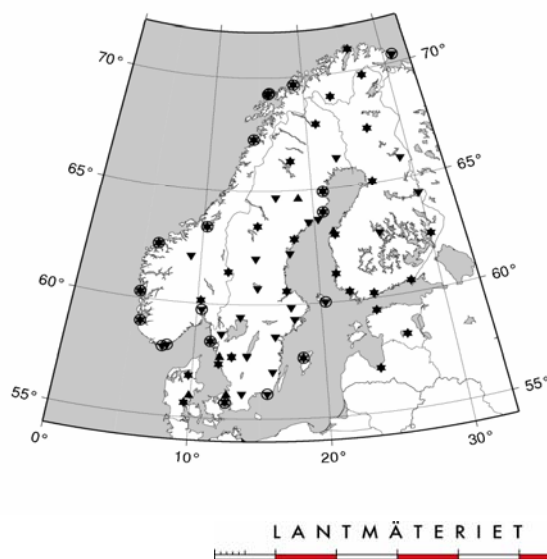
NGOS plan

Absolute gravity points (triangles)

Nordic permanent GNSS network (upside down triangles)

Tide gauges (circles).

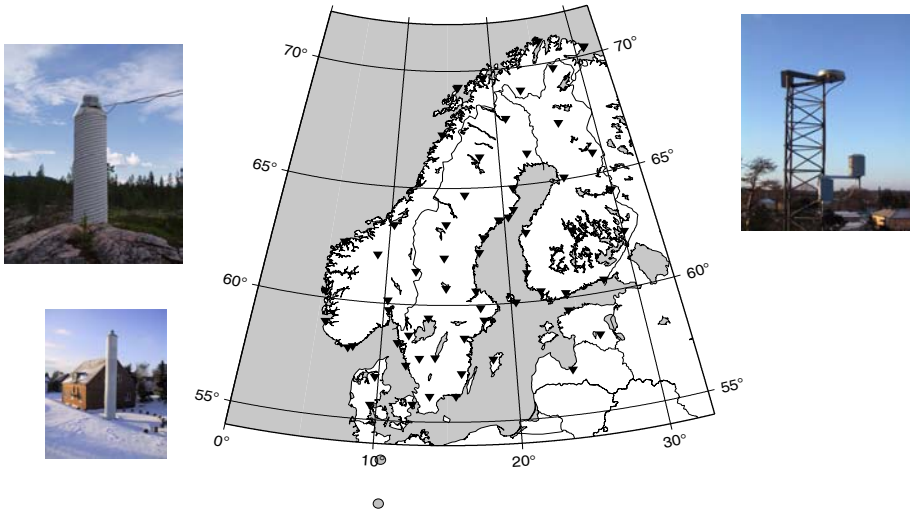
All absolute gravity points are occupied with a GNSS instrument



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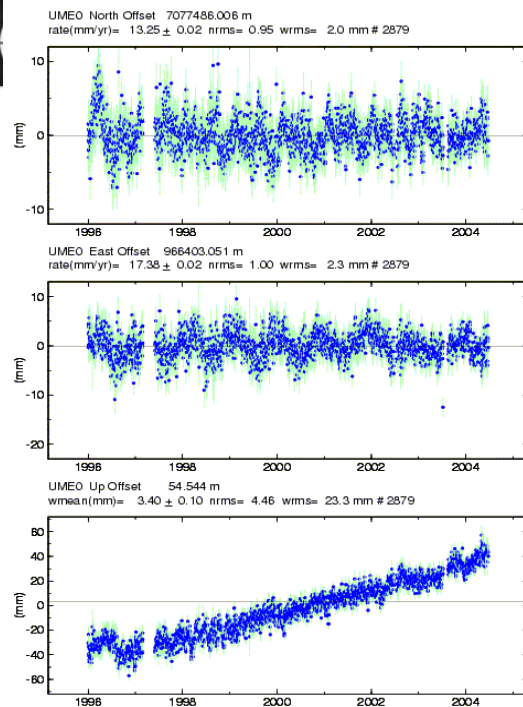
Nordic Permanent GNSS Network



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Annual and secular variations



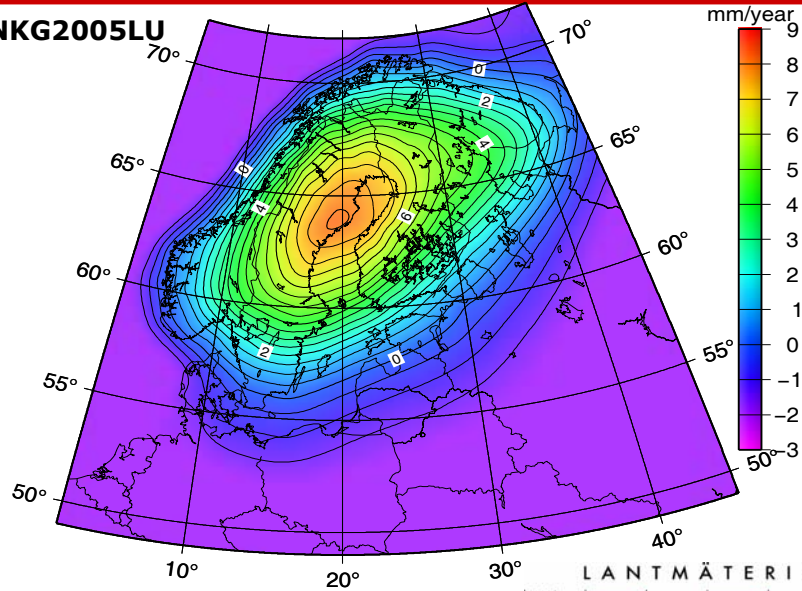
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Postglacial rebound

FIG

NKG2005LU



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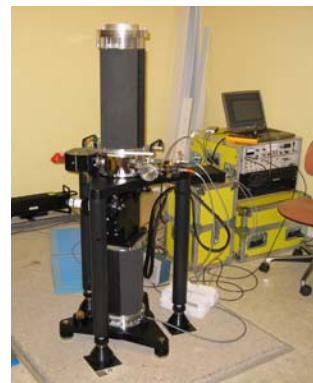


Absolute gravity stations

FIG



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Gravimetry

FIG



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Conclusions

FIG

- NGOS in line with international activities, especially GGOS
- For the Nordic countries, main focus will be on crustal motion, dynamics of glaciated areas and sea level
- Focus on col-located stations, using primarily existing geodetic infrastructure
- More work on products as well as meta data information

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