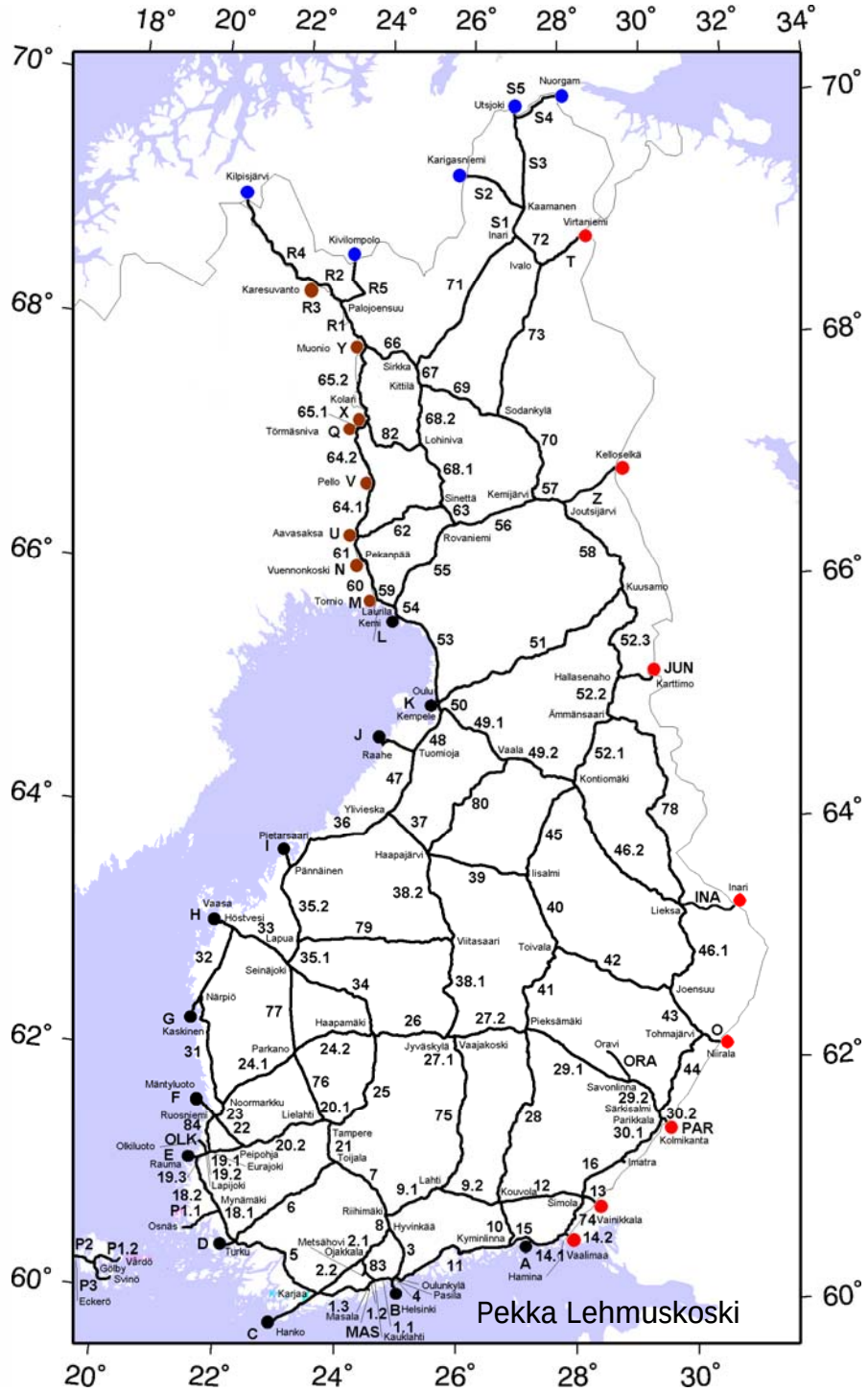
National Report of Finland

by

Markku Poutanen

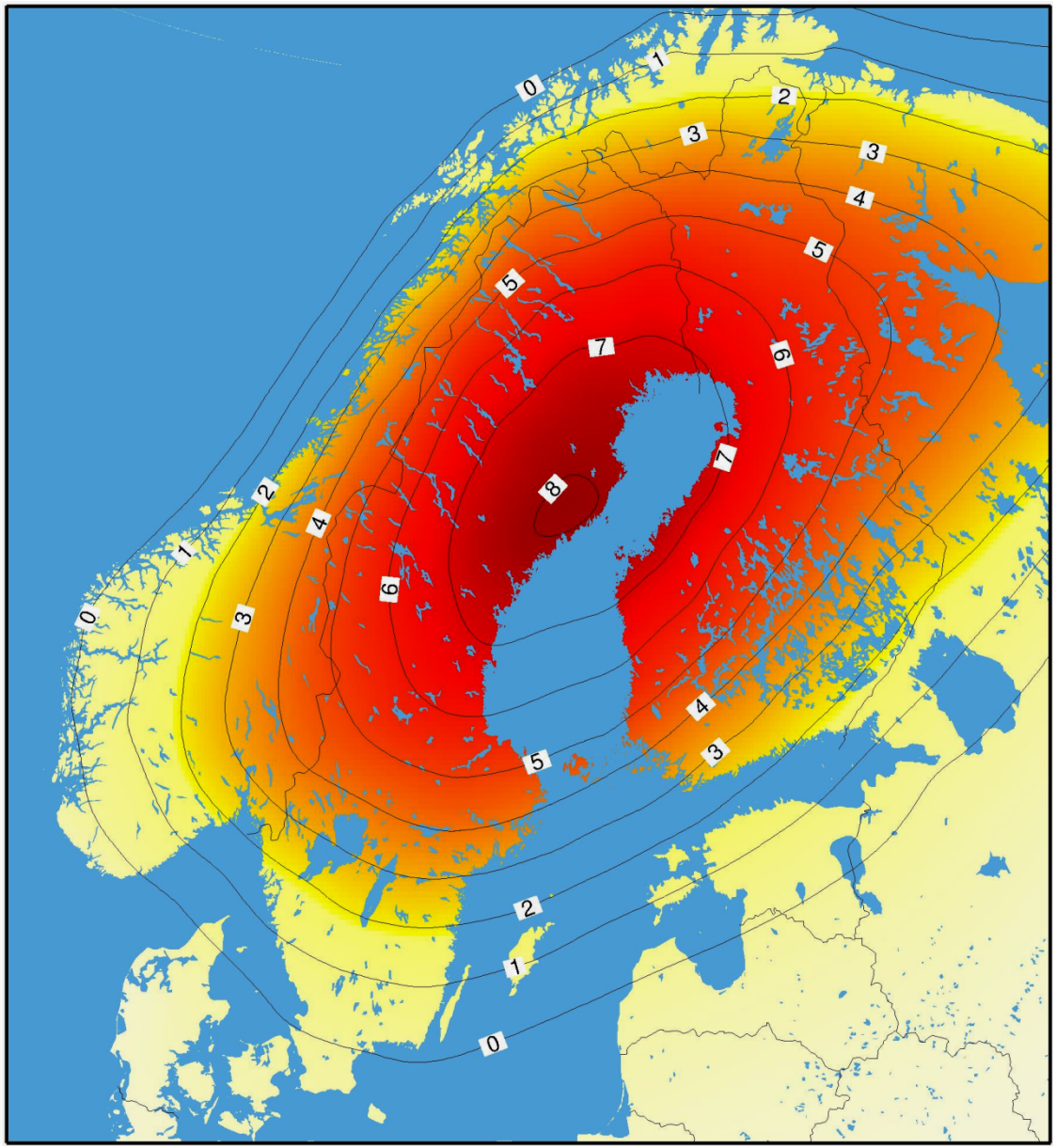
Finnish Geodetic Institute

New Height system N2000



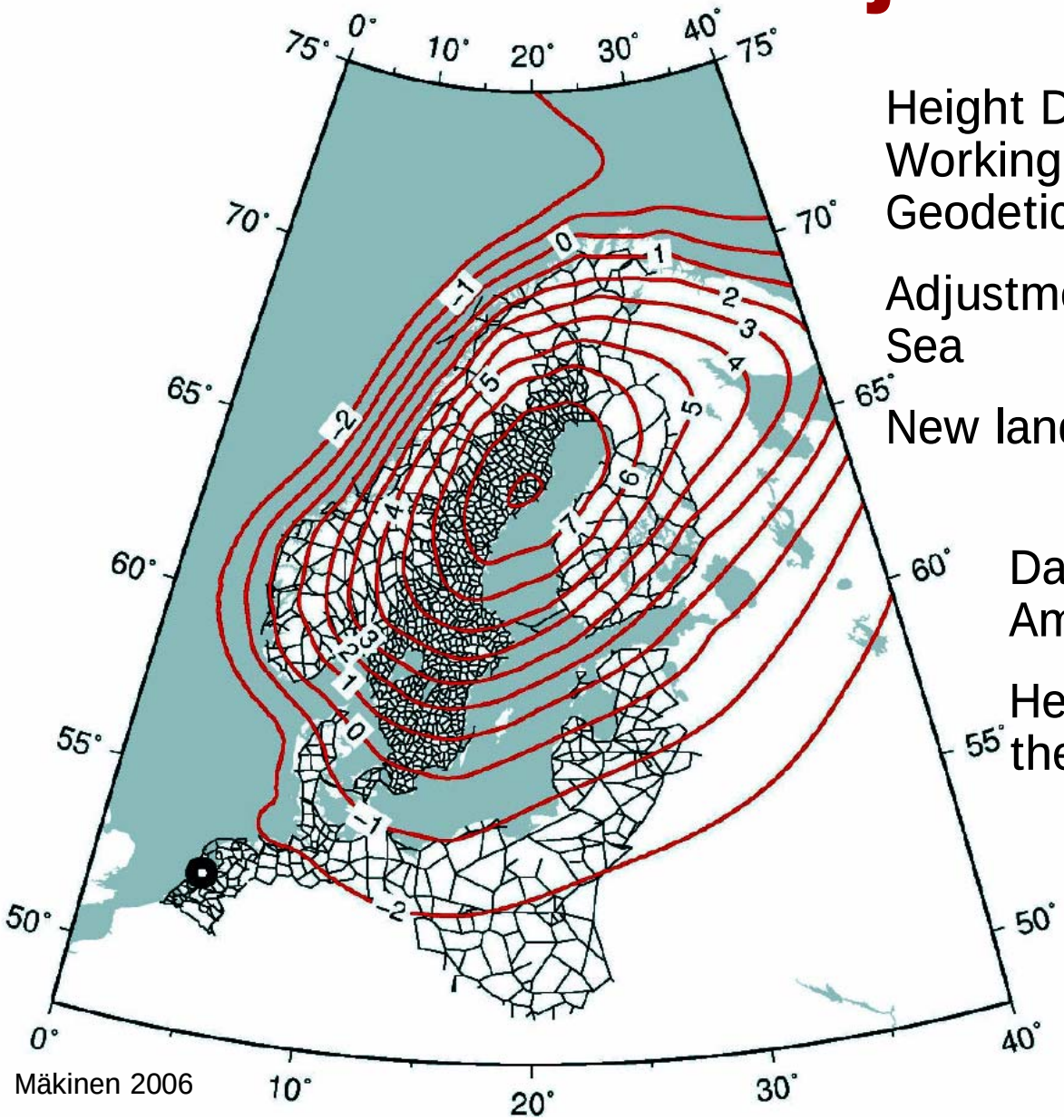
- 1978-2004, 2006
- 10 observers
- About 800 field assistants
- Double measured lines 9158 km,
- 6092 benchmarks
- Data to UELN
- Joint publication with Roskartografia / TsNIIGAiK on Russian-Finnish border crossing

Land uplift changes heights



- Since 1960 at the West coast more than 40 cm, at the SE Finland ca 20 cm
- Practical importance e.g. waterways
- GPS-height determination requires uplift corrections

The Nordic Adjustment



Mäkinen 2006

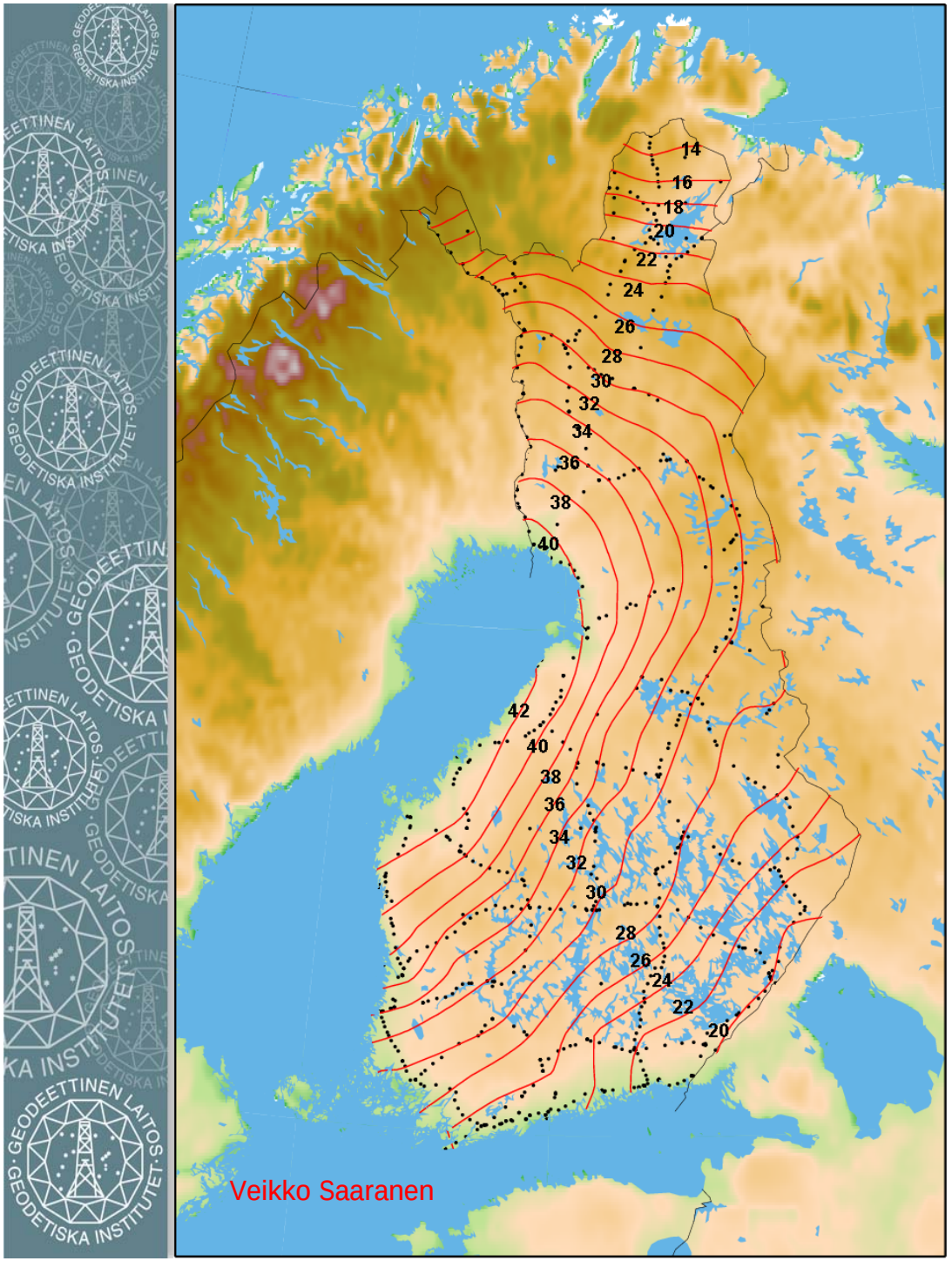
Height Determination Working Group of the Nordic Geodetic Commission

Adjustment around the Baltic Sea

New land uplift model

Datum: NAP (Normaal Amsterdams Peil)

Heights computed to the epoch 2000



Difference between N60 and N2000 is mostly due to the land uplift

Metsähovi was selected as the datum point

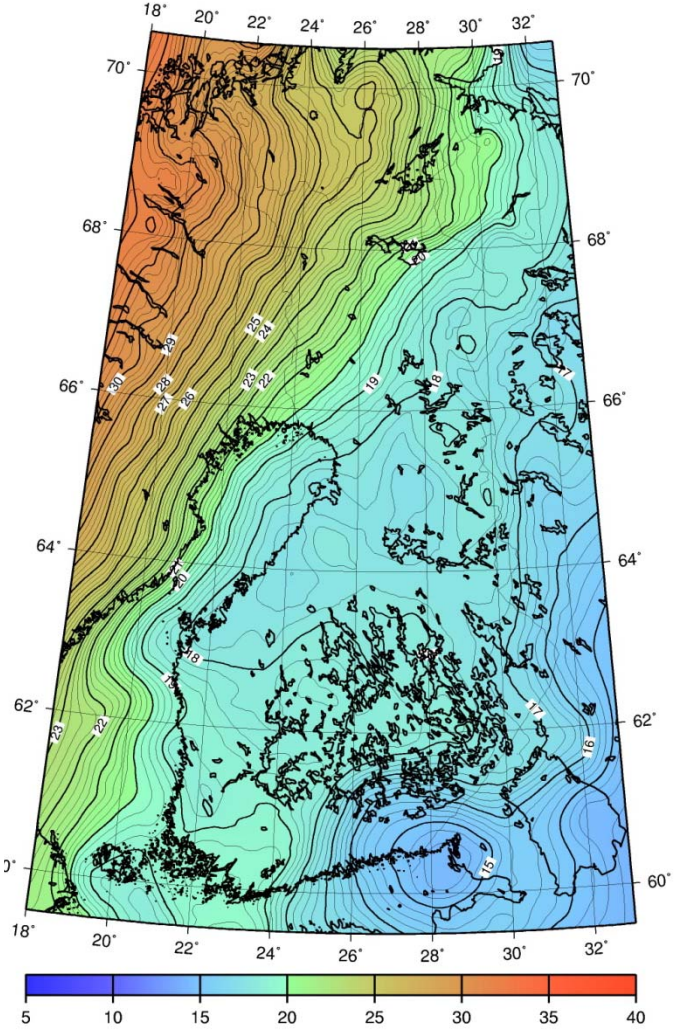
Geopotential value for Metsähovi benchmark was taken from the Nordic Adjustment

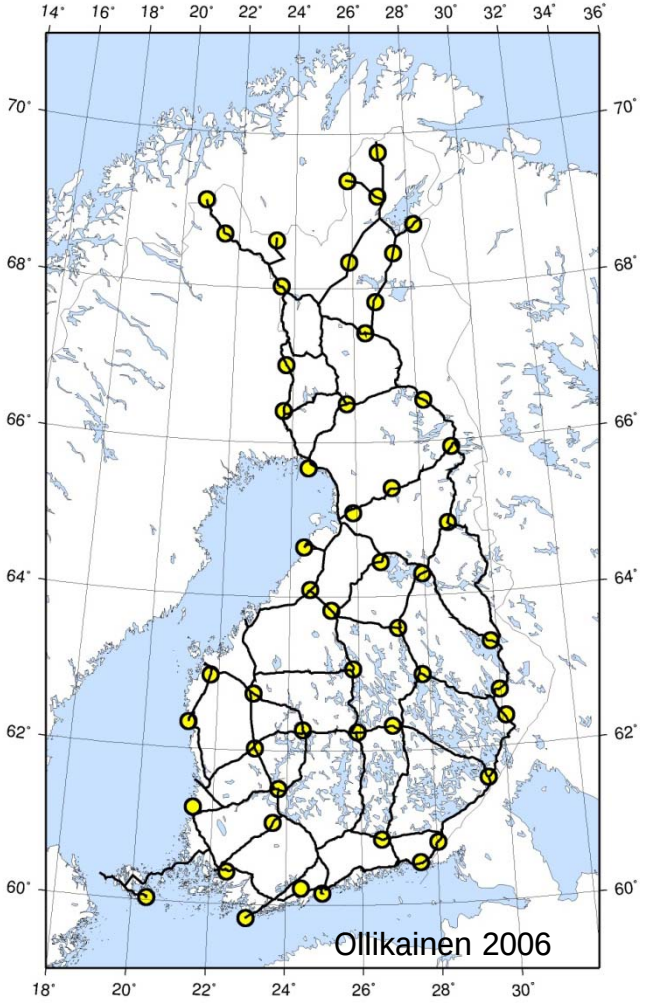
Difference to the Swedish RH2000 less than 2 mm at the border

Implementation of N2000

- Recommendations for the public administration (JHS recommendations)
  - FGI and the National Land Survey
  - N2000 description and realisation
  - N60 and N2000 related geoid models -> $H = h - N$
  - JHS draft now circulated for comments
- Publishing in Autumn 2007; joint effort of FGI, NLS, Finnish Maritime Administration and Finnish Institute of Marine Research

FIN2005 geoid model

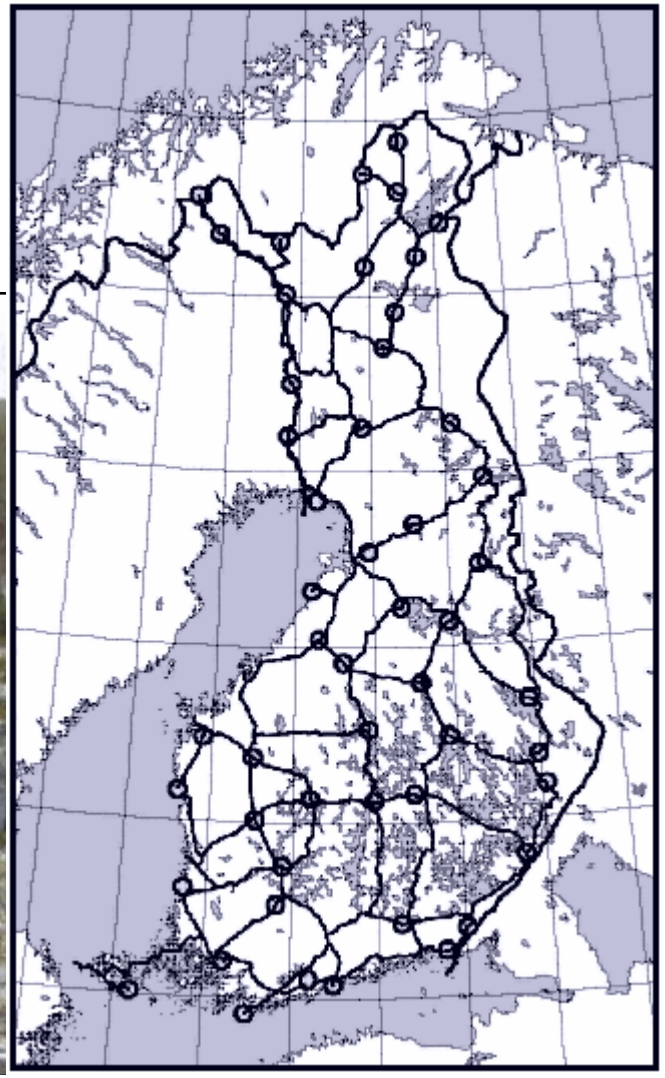


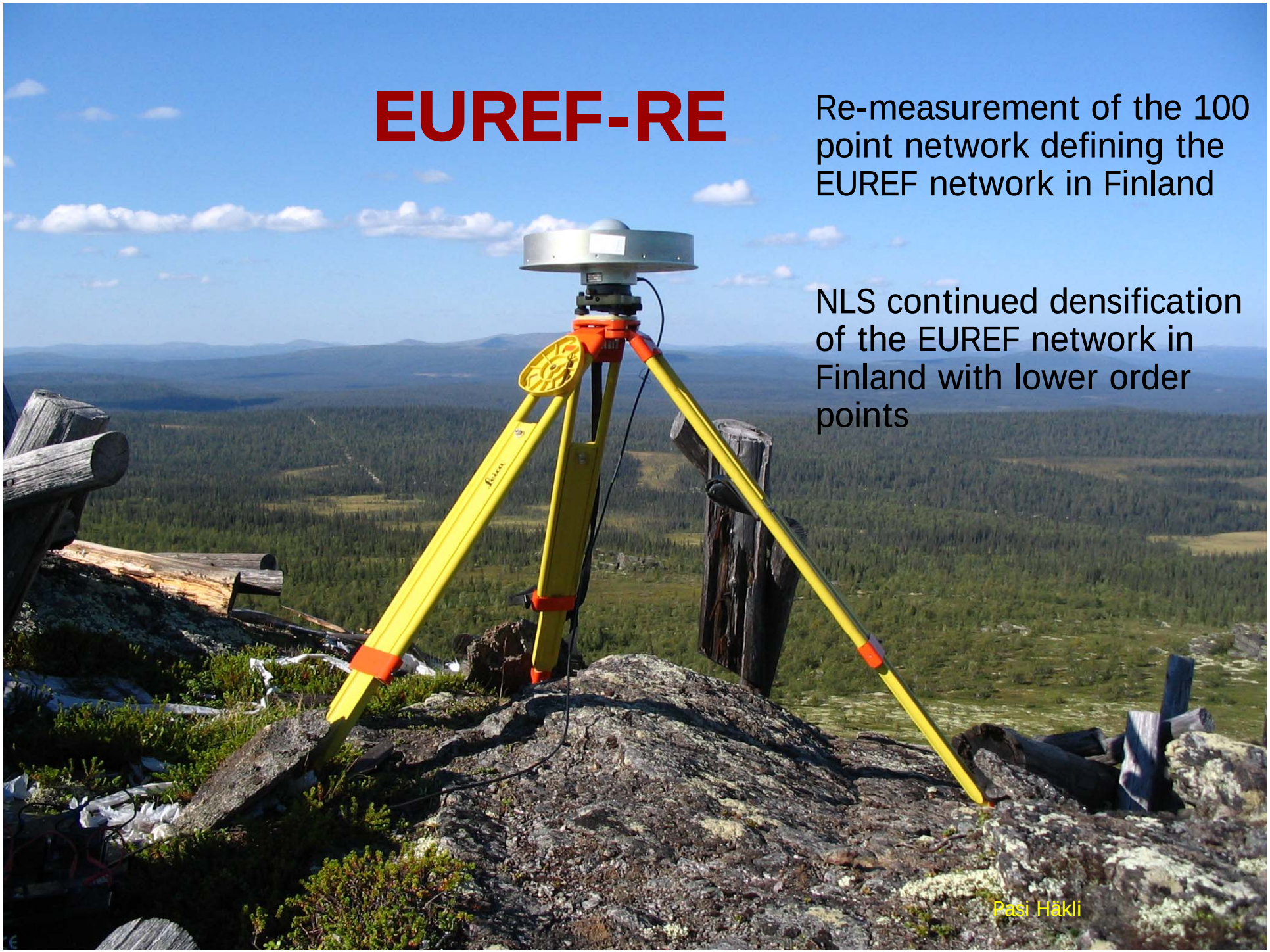


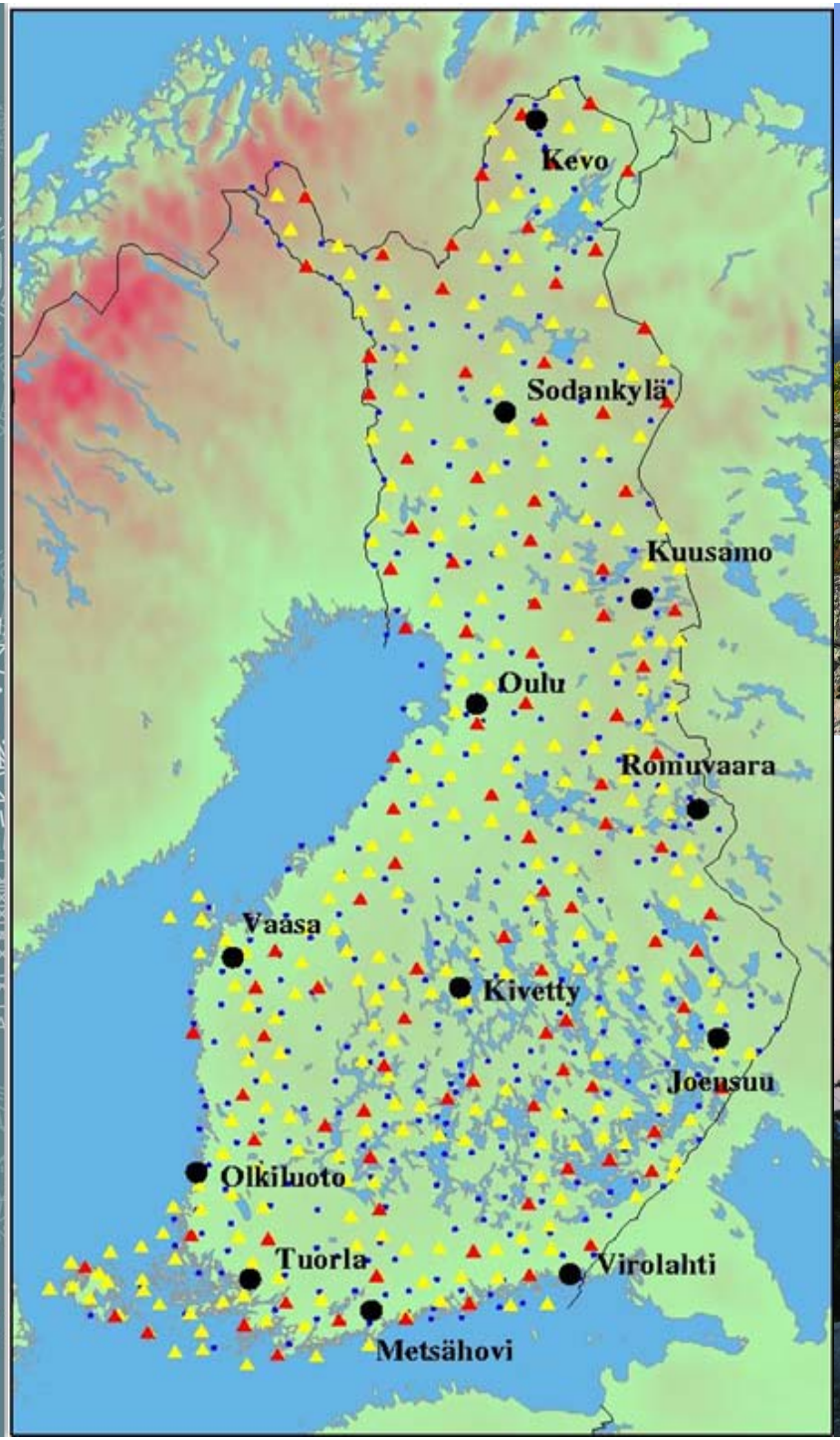
FIN2005 geoid model is based on Nordic NKG2004 geoid, which is adjusted on the precise levelling network and GPS levelling (EUVN-DA points) ; to be published 2007

European Unified Vertical Network (EUVN), EUVN-DA

- EUVN-DA (Densification Action); measured 2005; Published in 2006




EUREF-RE
Re-measurement of the 100 point network defining the EUREF network in Finland
NLS continued densification of the EUREF network in Finland with lower order points
Pasi Häkli


Kevo
Sodankylä
Kuusamo
Oulu
Romuvaara
Vaasa
Kivetty
Joensuu
Olkiluoto
Tuorla
Virolahti
Metsähovi


Hannu Koivula


Pasi Häkli


Permanent GNSS Network
FinRef
13 stations, 4 in EPN, 1 in IGS
Data download (ADSL) hourly
Real time started (2007) Metsähovi, Sodankylä

Participation on GGOS steering Committee

NGOS project of the NGK; start planning of the structure

Gravity plan; regular repeated gravity observations

Metsähovi

geoVLBI

8 campaigns in 2006 & 2007

IVS, EURO campaigns

SLR

New laser 2007

2 kHz pulse rate

Renovation 2007-2008

GPS, GLONASS, SCG

DORIS