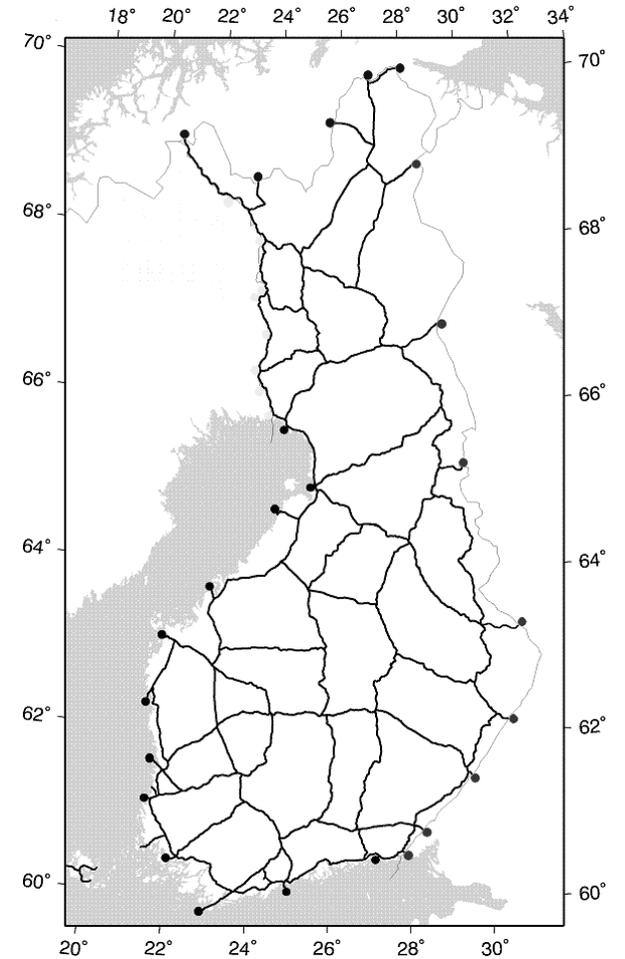
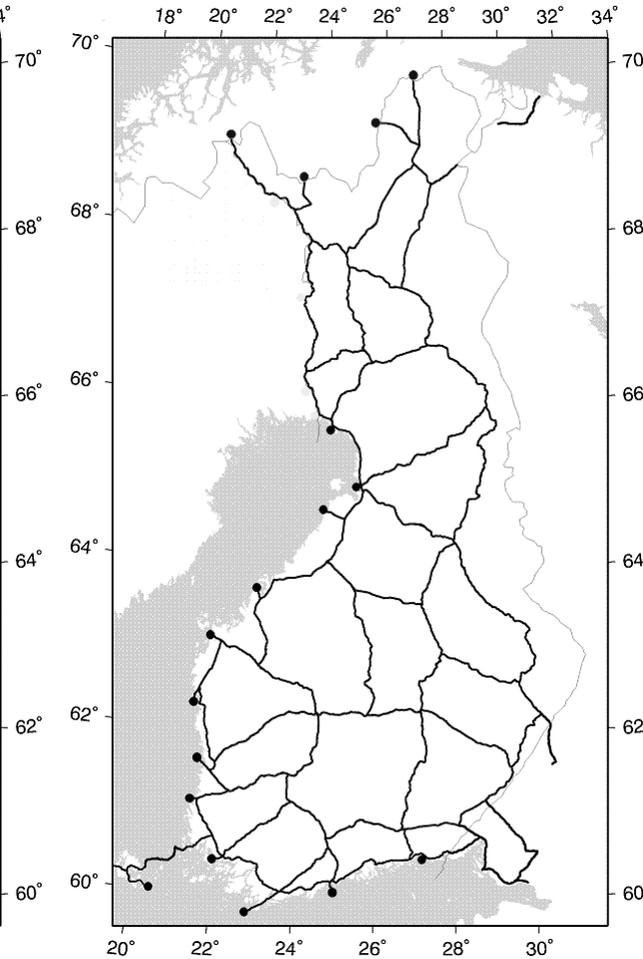
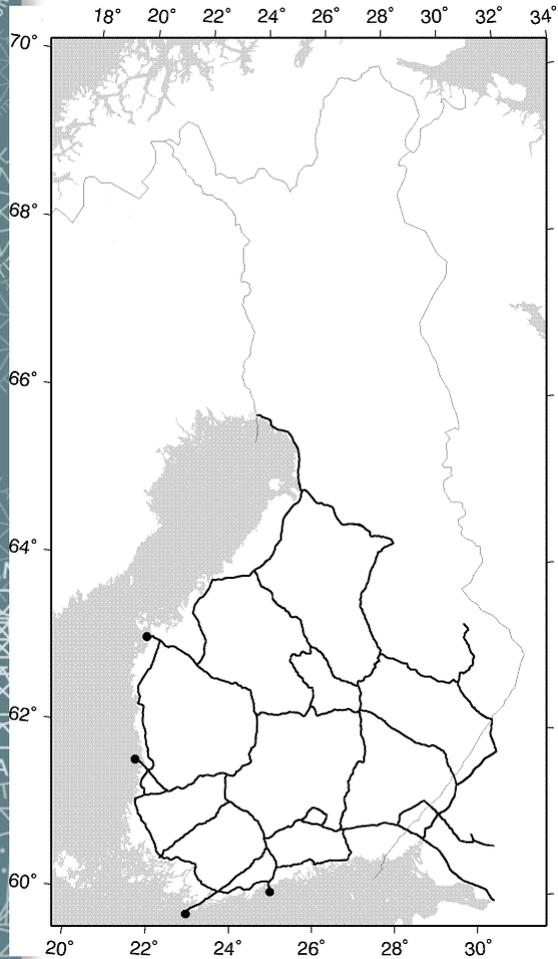
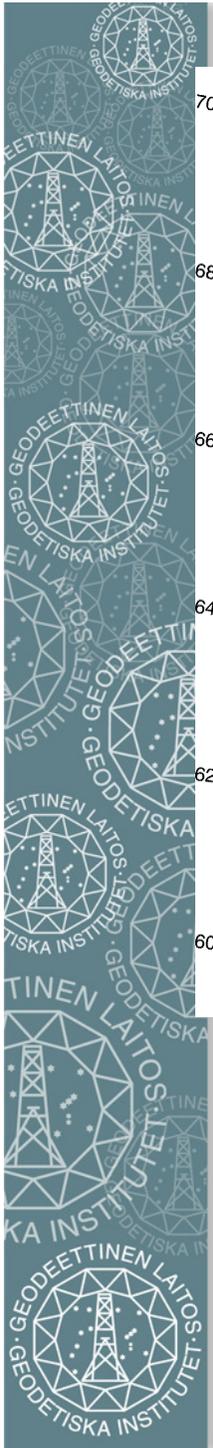


The new Finnish height system N2000

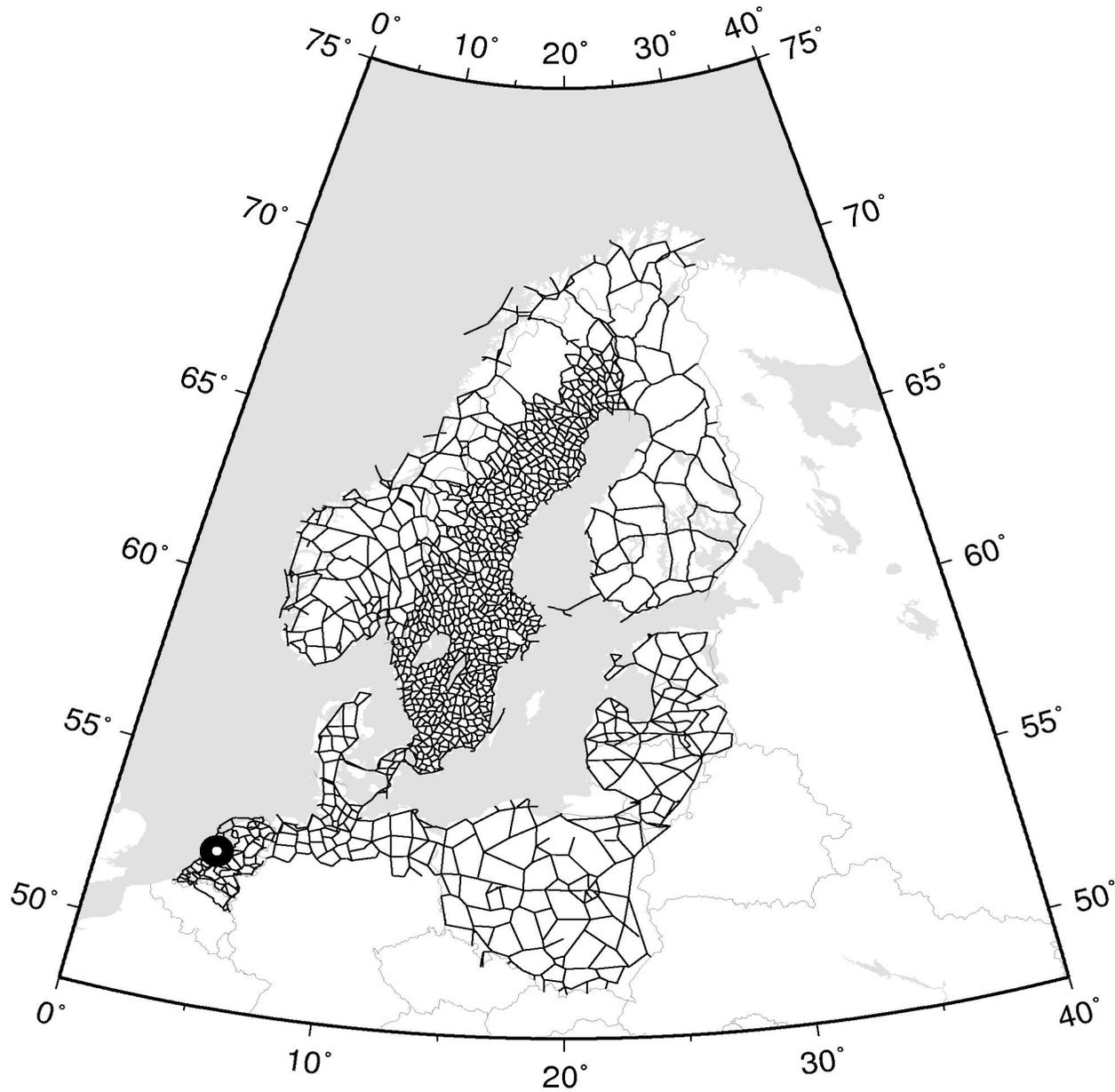
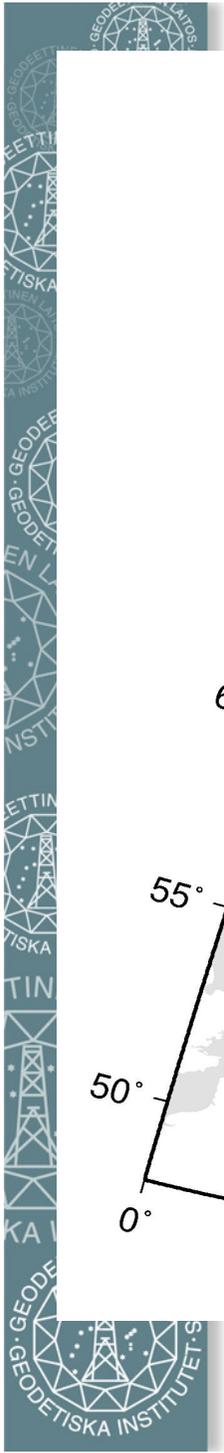
V.Saaranen, P. Lehmuskoski, P. Rouhiainen,
M. Takalo, J. Mäkinen

Finnish Geodetic Institute



First (1892-1910), Second (1935-1975) and Third Levelling of Finland

Accuracies are 1.3, 0.7, and 0.8 mm/ $\sqrt{\text{km}}$

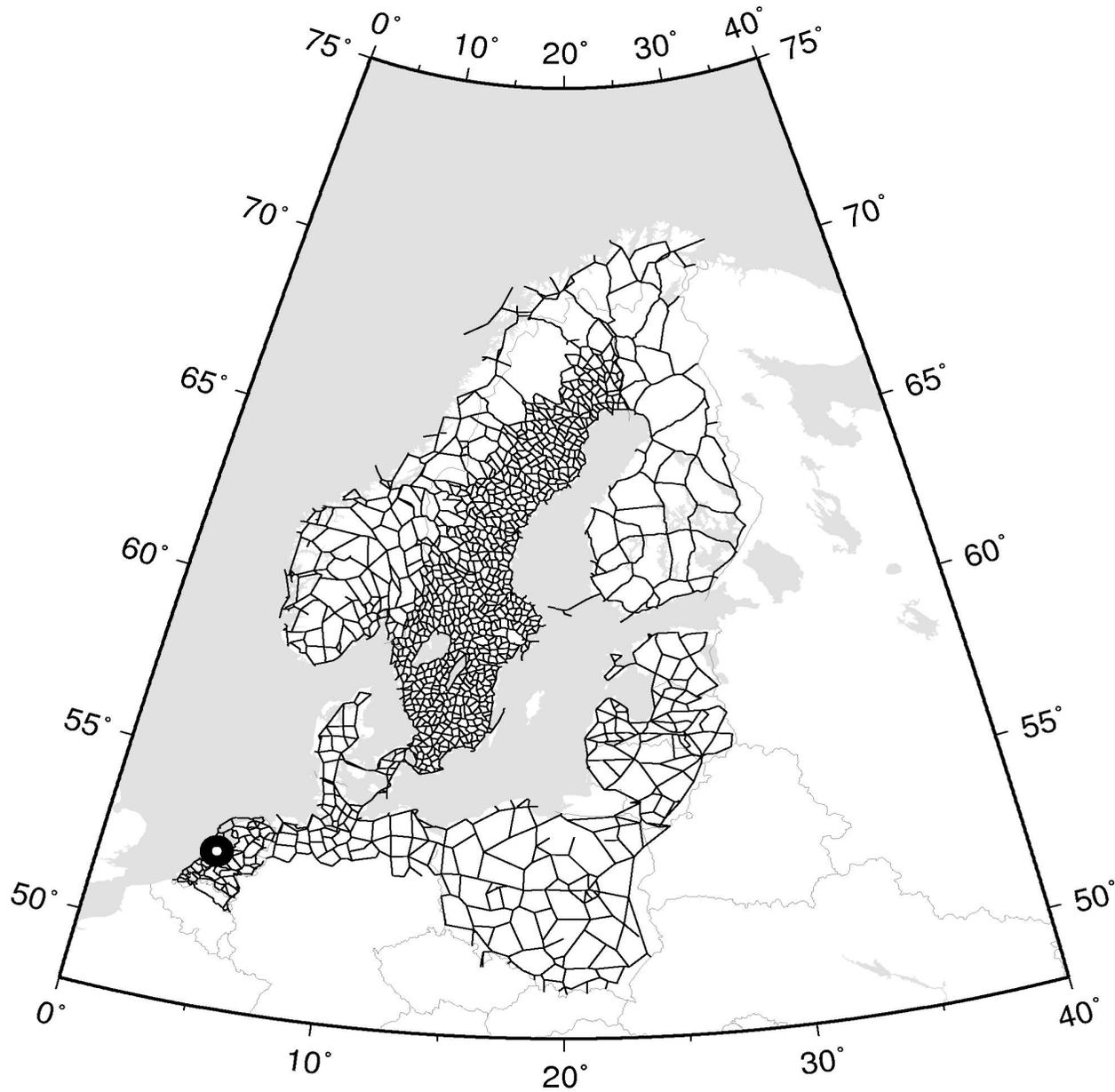


Baltic Levelling
Ring in Nordic
(NKG) and
international
cooperation

NKG2005 Land
Uplift model,

Height
differences
reduced to
epoch 2000.0

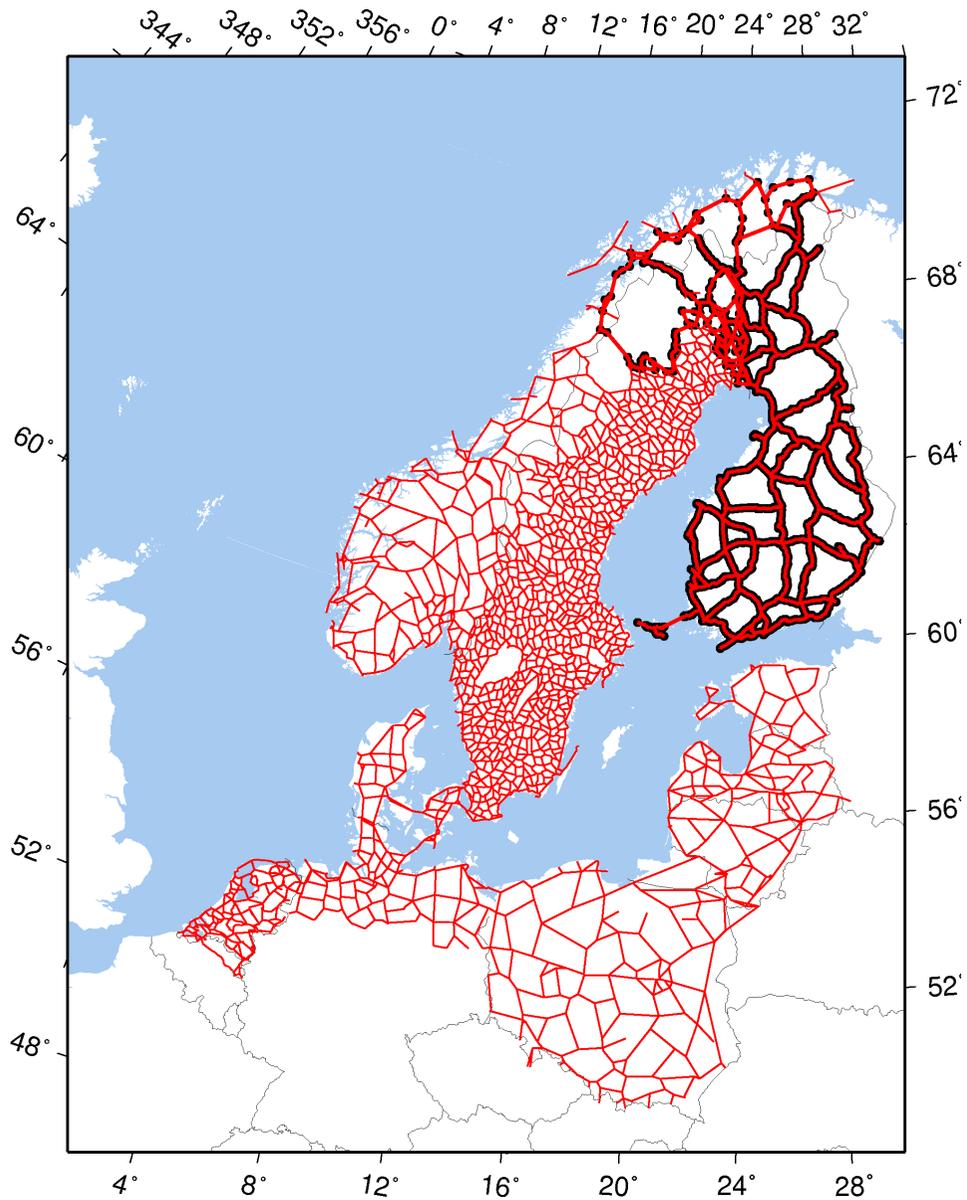
Zero system for
permanent tide



1) Finnish adjustment of Baltic levelling ring (slight differences in data in Finland)

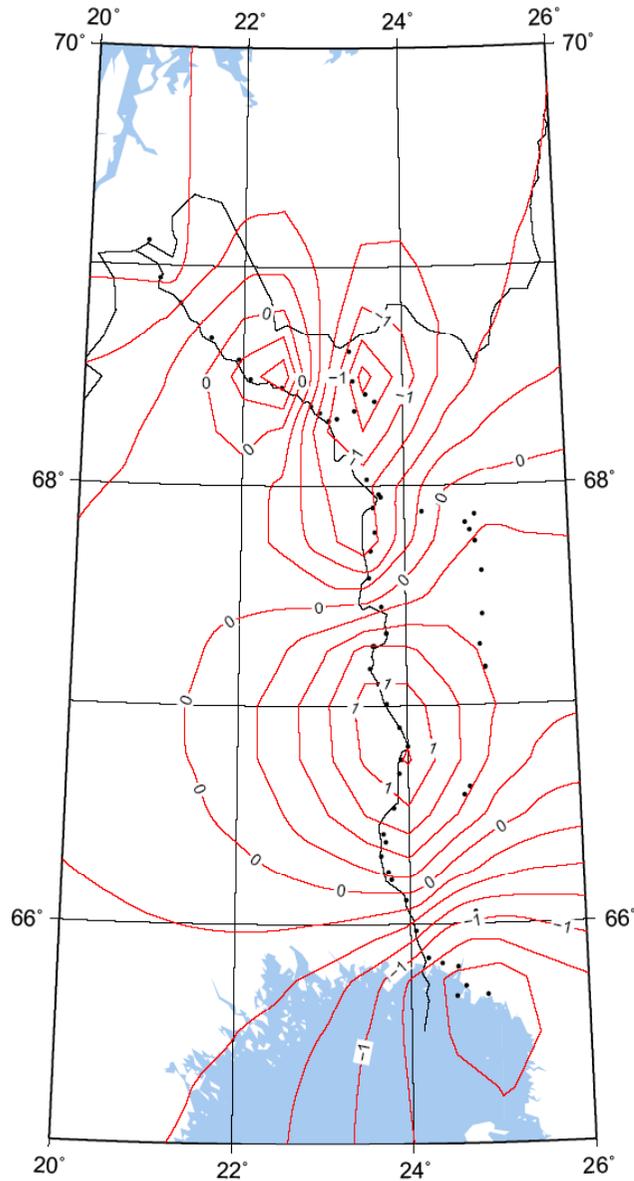
EVRF2000 datum point 13600 fixed

2) This gives value for National Datum Point in Metsähovi



3) Finnish network and neighbouring loops in Sweden and Norway are then adjusted keeping the National Datum Point fixed

4) Normal heights

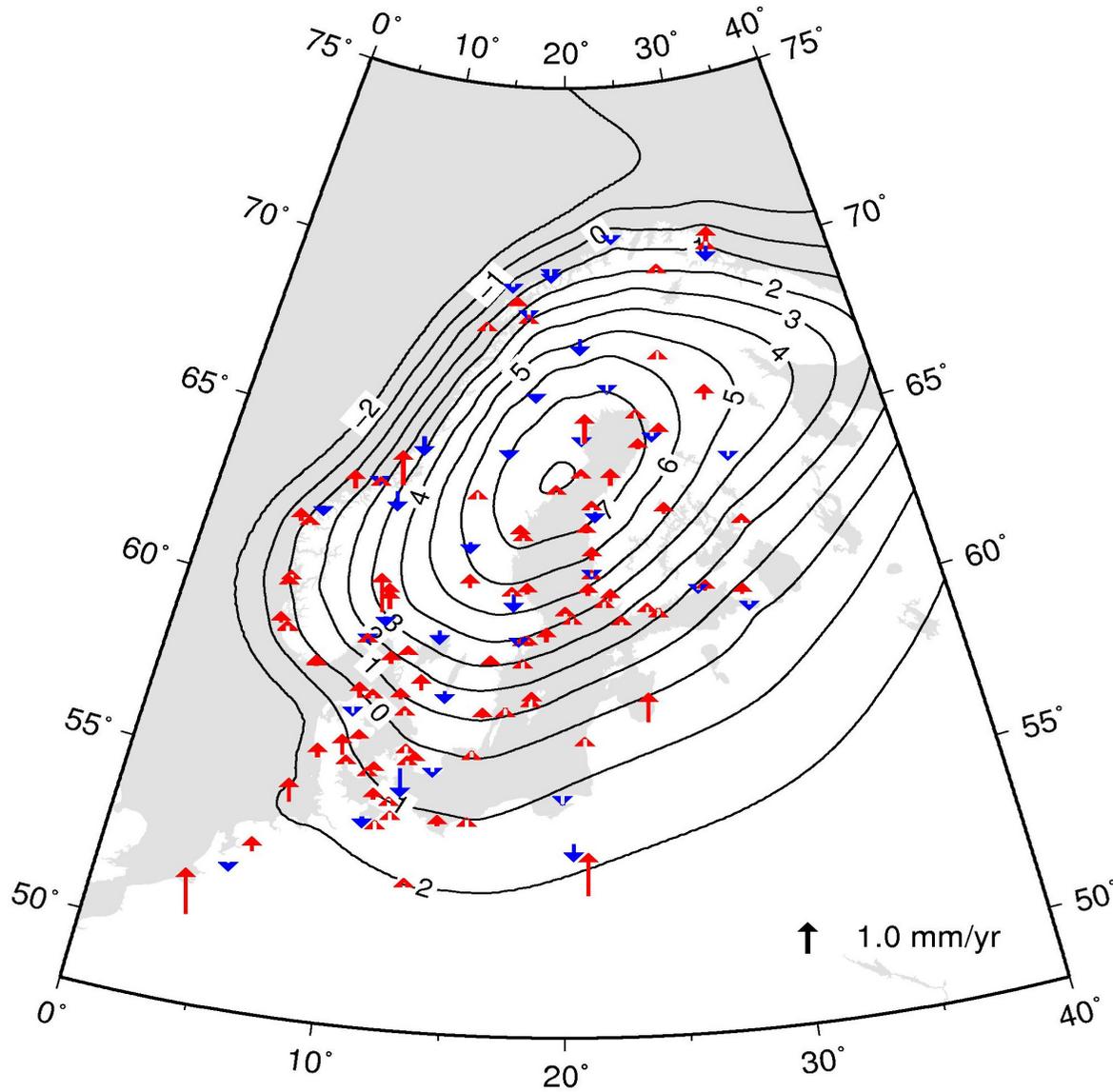
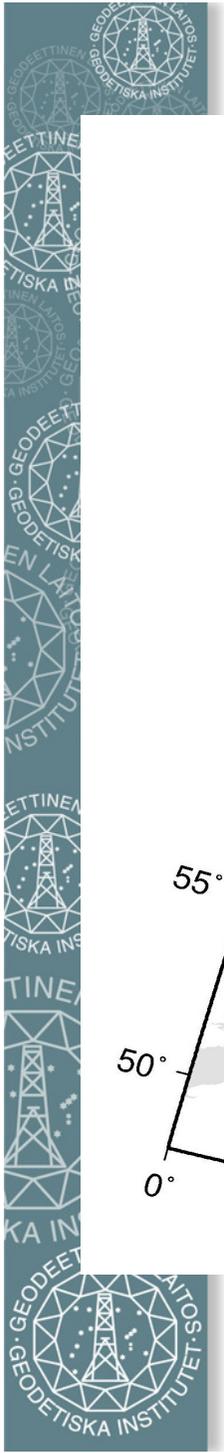


5) Differences to new Swedish height system RH2000 are negligible.

Unit is mm

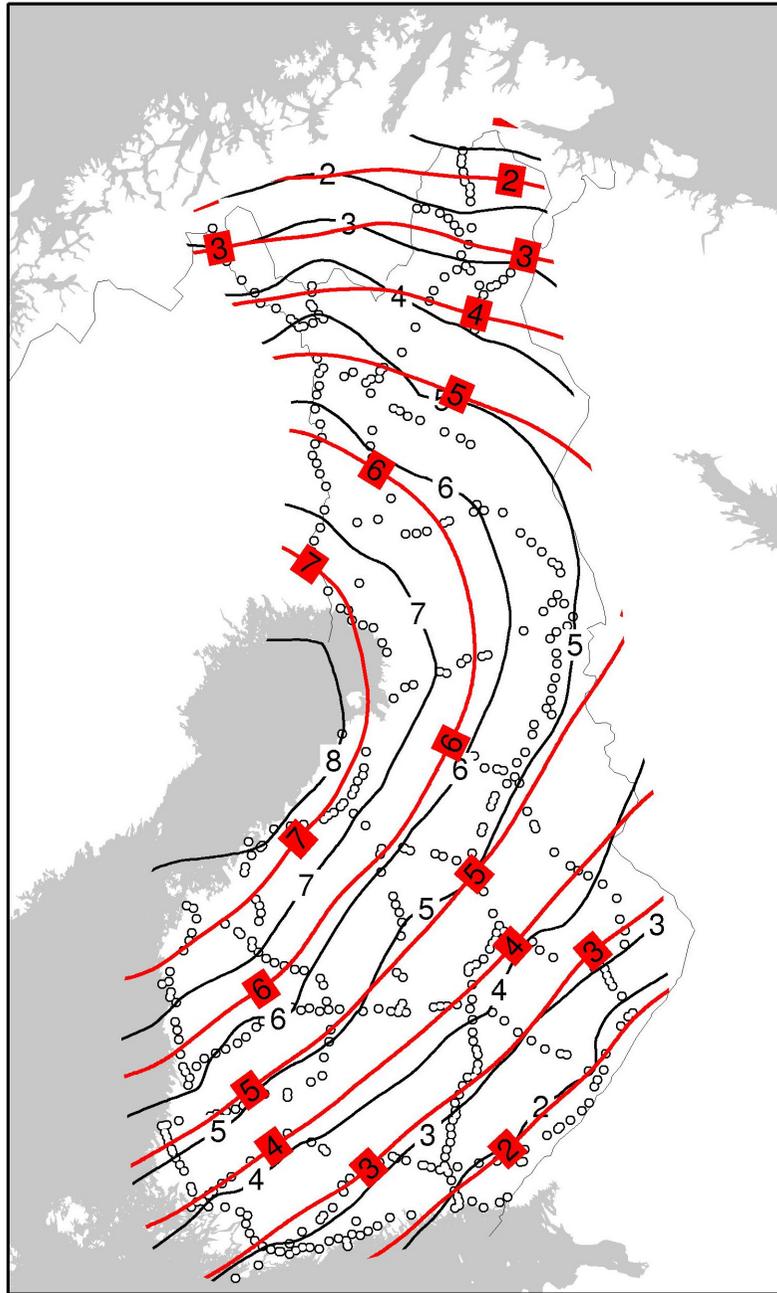


We are using the hybrid (= empirical + geophysical GIA) uplift model NKG2005 LU, although in Finland repeated levellings alone are sufficient to resolve uplift rates.



**NKG2005
Land
Uplift
model**

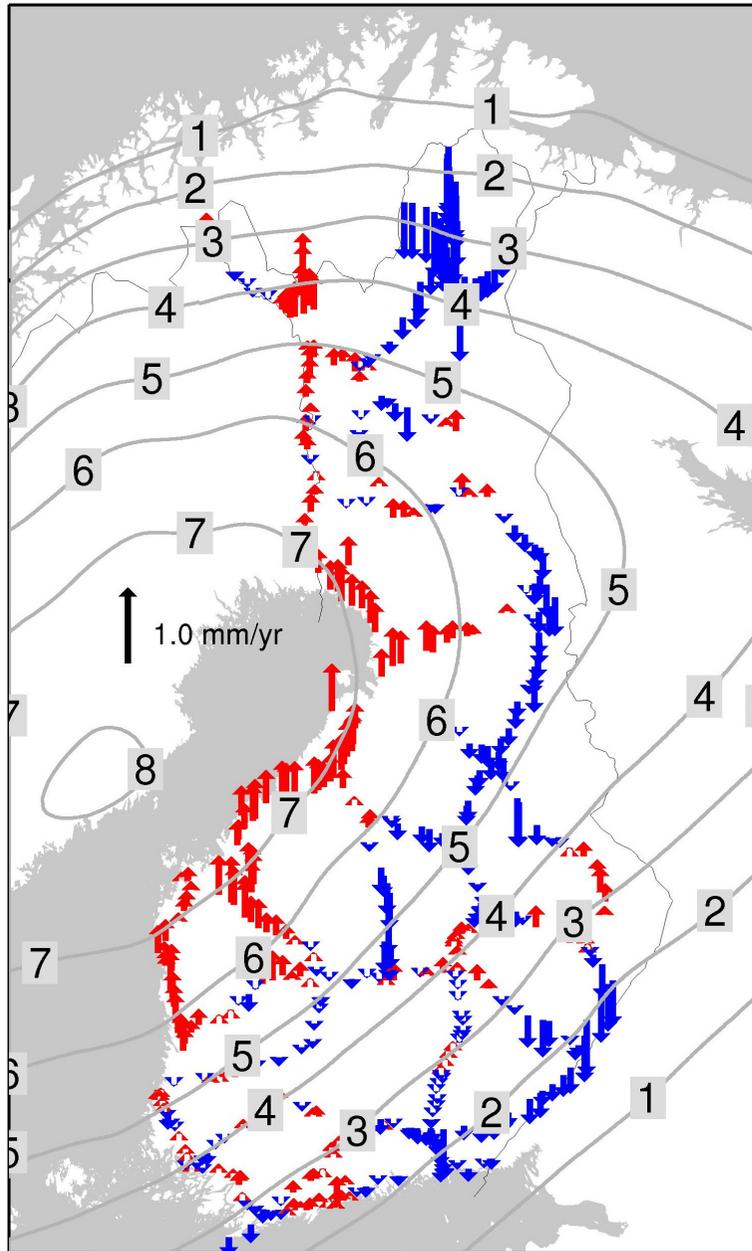
**Fit to
CGPS and
TG data**



NKG2005
Land Uplift
model
Red curves

Uplift from
repeated
levelling
Grey curves

mm/yr
relative to
MSL



Uplift from
repeated
levelling

minus

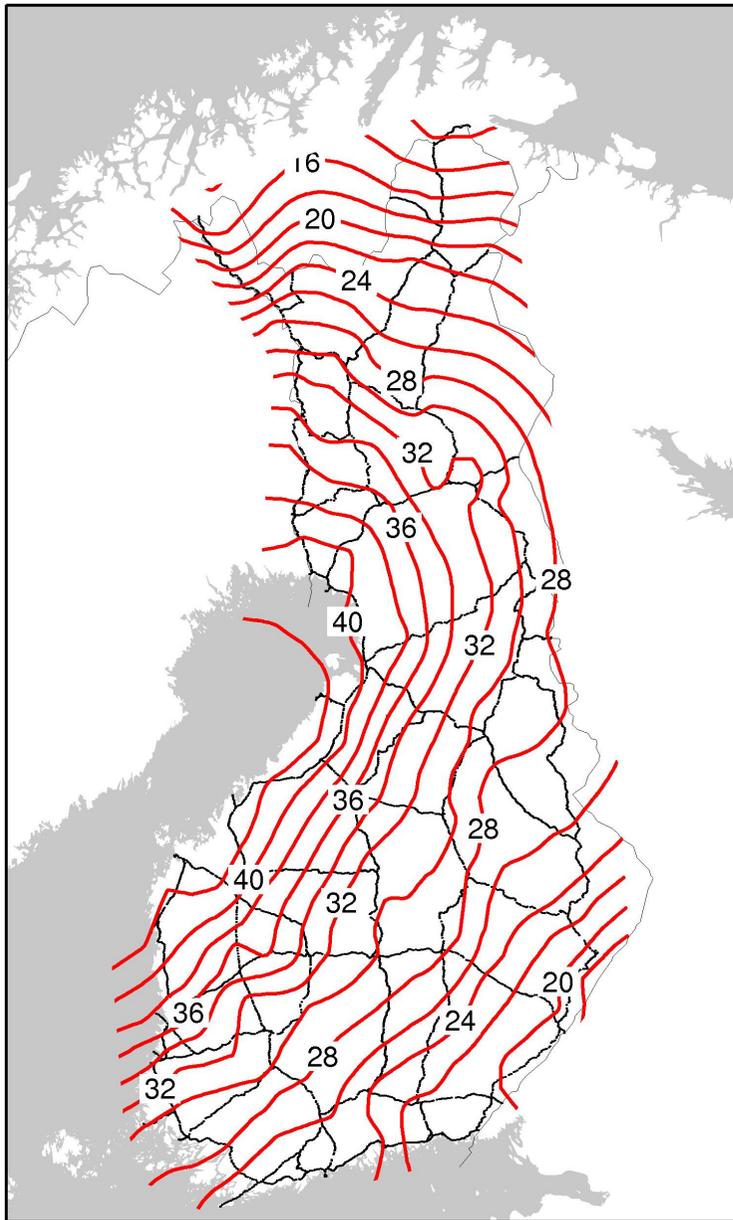
NKG2005 LU

= Arrows

Grey curves=
NKG2005 LU

Old height system in Finland is N60

- Datum is MSL in Helsinki 1960.0
- Orthometric heights
- Mean tidal system

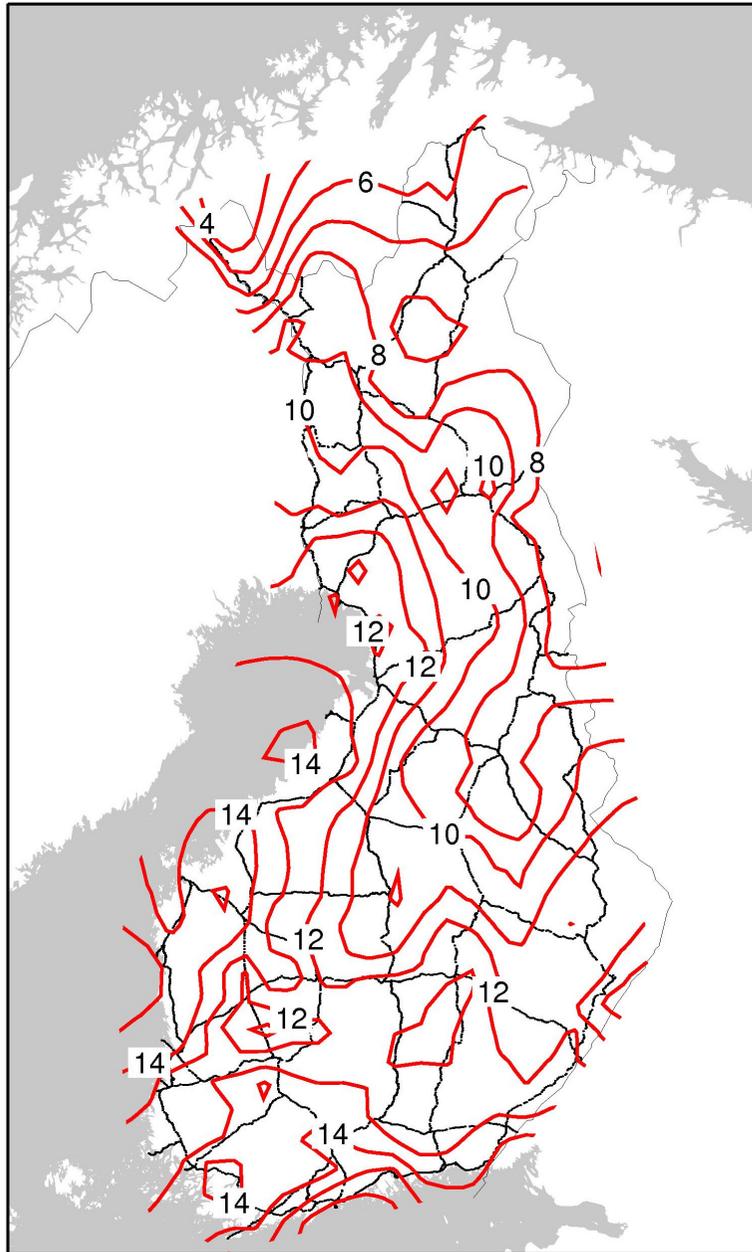


Difference

N2000 heights
minus
N60 heights

in cm

contours 2 cm



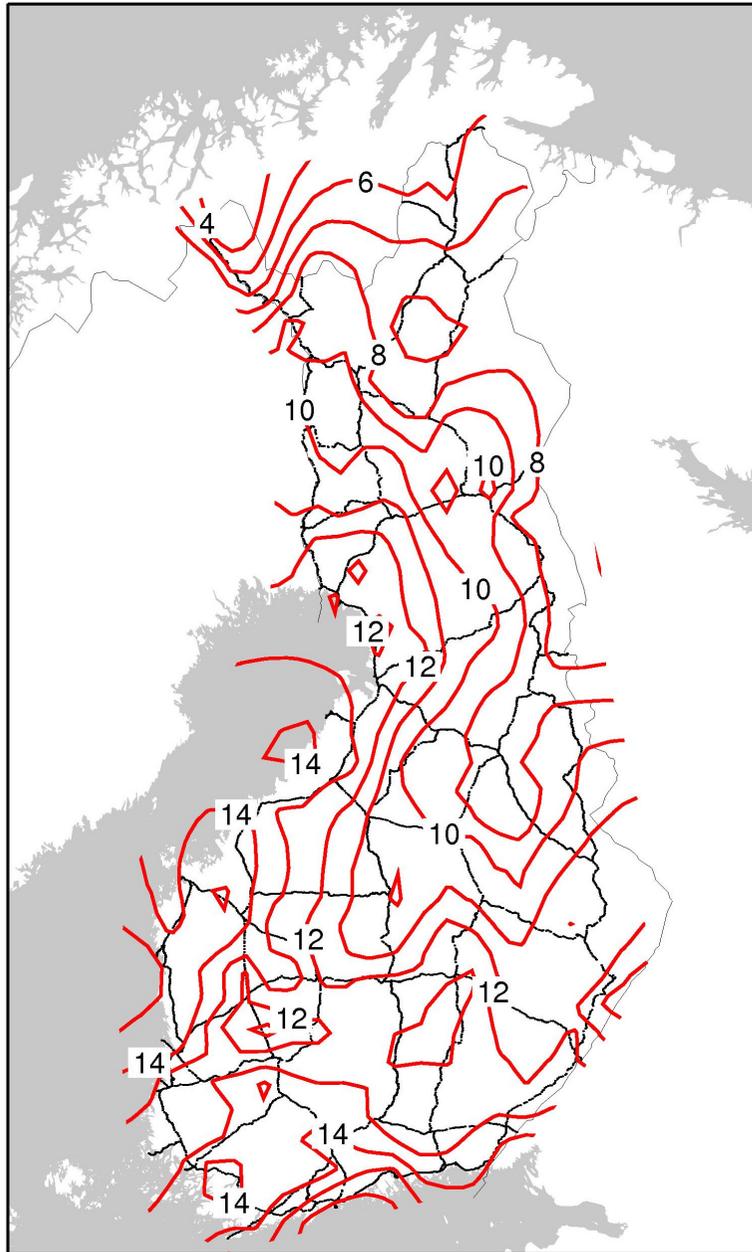
Difference

N2000 heights
minus
N60 heights

when 40 years of
uplift are
eliminated

in cm

Contours 1 cm



N-S tilt is to large extent due to the different systems for permanent tide

E-W differences would be diminished if the repeated levelling model for the land uplift had been used

Summary

- New Finnish N2000 height system released this summer
- Height differences refer to 2000.0, NKG2005 Land Uplift model
- Zero tidal system
- NAP "transported" to National Reference Point from 13600 using BLR, also in 2000.0 and in zero tidal system
- Normal heights
- Minimal differences to RH2000 of Sweden