MAA-AMET
Estonian Land Board

National Report of Estonia 2008

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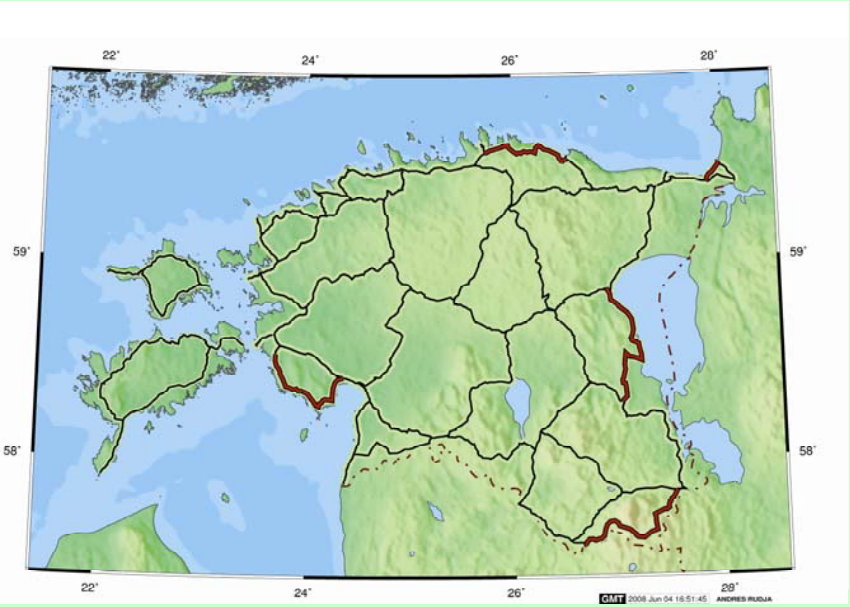
High-precision levelling

- Inspection and reconstruction of levelling lines
  - Year 2007: 331 km
  - Altogether: 2928 km
- Statistics
  - 44% of elevation marks were damaged or unfound
  - 928 new marks were placed
- High-precision levelling
  - Year 2007: 631 km
  - Year 2008: 571 km
  - Year 2009: 573 km



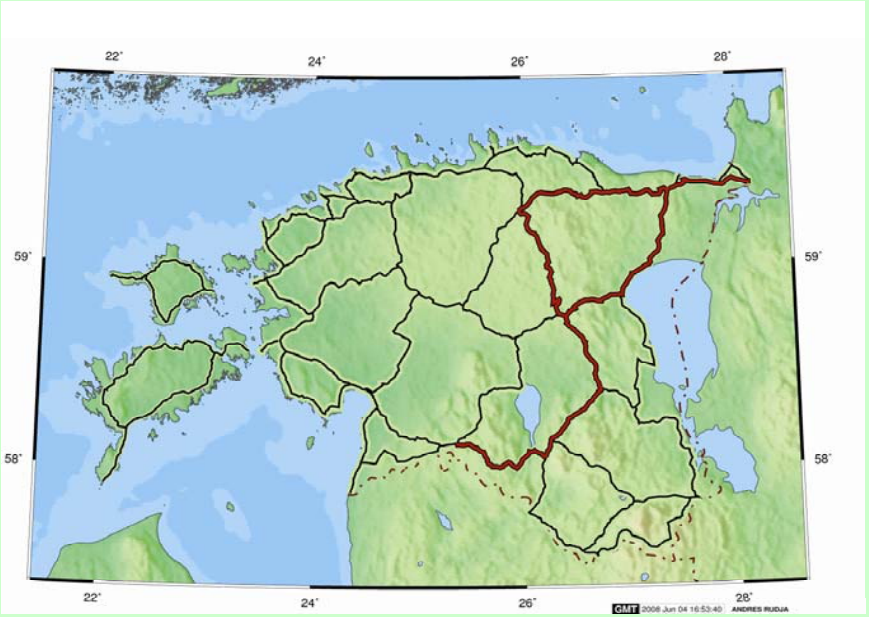
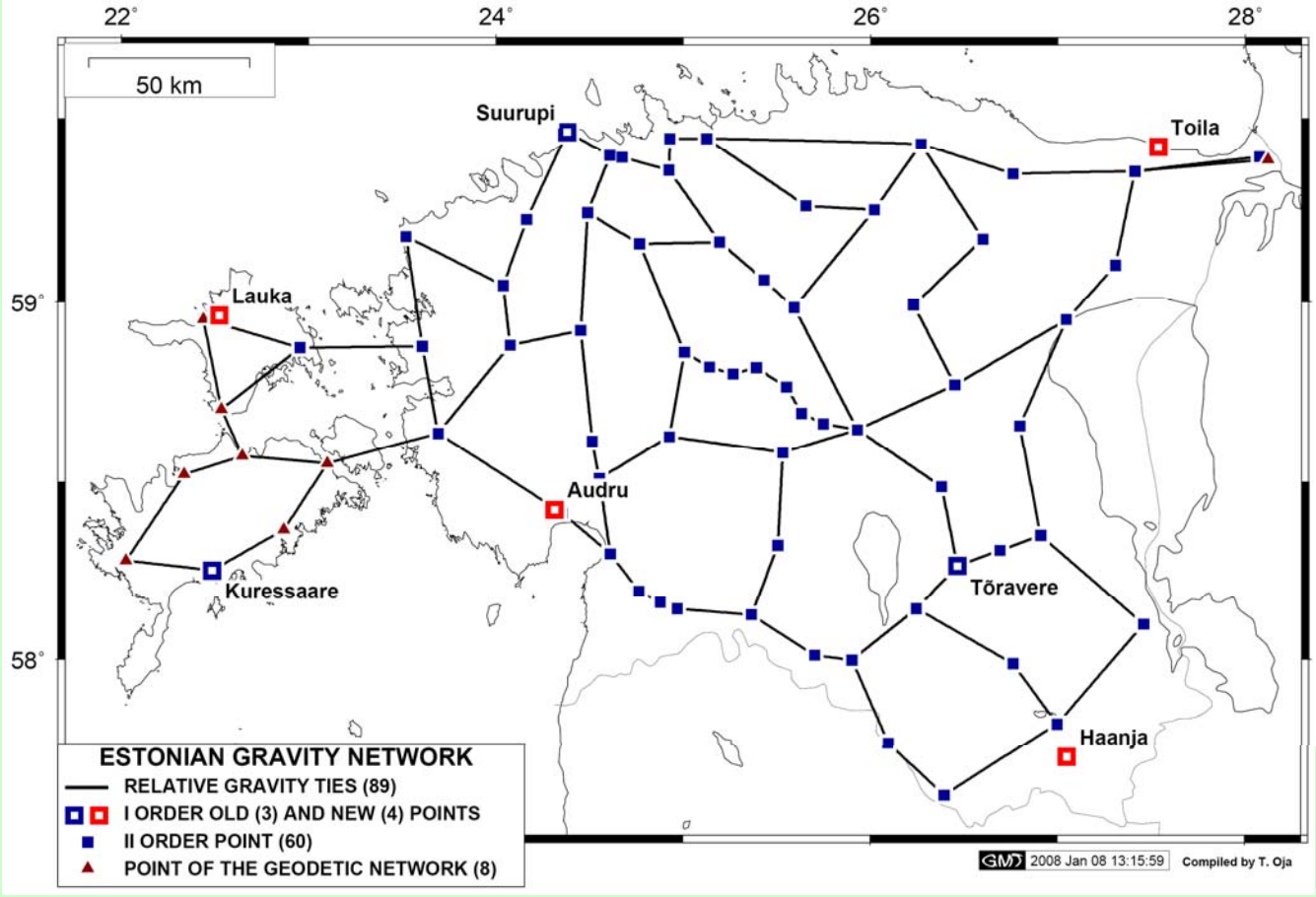


Fig. 1. Estonian Levelling Network

Levelling lines (red), reconstructed in 2007 (right); levelling lines (red), measured in 2007 (left)

Gravity networks

- Activities in 2007
  - 4 new I order points were established
  - In two points – Suurupi and Tõravere – the absolute measurements were performed (with cooperation of the Institute of Geodesy of University of Hannover)
- Activities in 2008
  - Absolute measurements on I order network points (altogether 7) in cooperation with FGI
  - New absolute points will be tied to the rest of network by relative gravity measurements
  - On all I order points the vertical gradient of gravity and its non-linearity will be determined



Estonian gravity network with relative gravimetric ties

Re-measurements of Estonian geodetic network

- Measurements of the Estonian geodetic network in 1997
- Re-measurements were planned for 2007
  - Postponed (the establishment of permanent stations network took longer than expected)
- The re-measurements will take place between July 28 and August 1, 2008 in total on 12 points
  - Length of session is planned 72 hours
  - All operational permanent GNSS stations will be included
  - Measurement methods are similar to those used in 1997
- We expect to get preliminary results by the end of September 2008

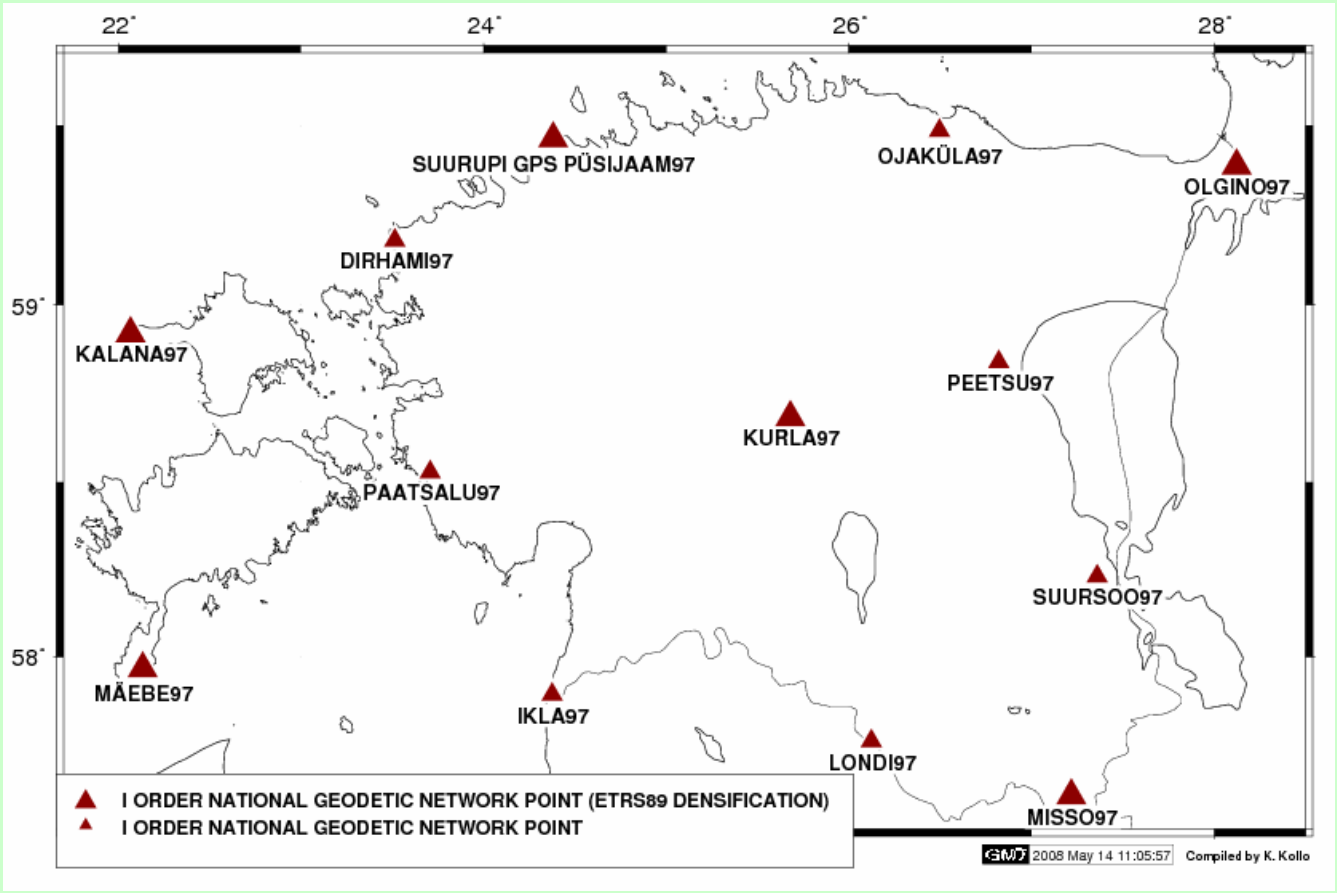


Fig. 3. I order Estonian National Geodetic Network

Geodetic networks in municipalities

- Activities before 2007
  - Geodetic networks completed in approx. 50 settlements
- Activities in 2007-2008
  - Reconstruction of geodetic networks in 12 settlements
- Activities in 2009
  - Reconstruction of geodetic networks for three major settlements in the Rae Municipality and in the city districts of Kohtla-Järve
- GPS-measurements by the staff of the Land Board
  - Check the accuracy of local networks
  - Specify the transformation parameters

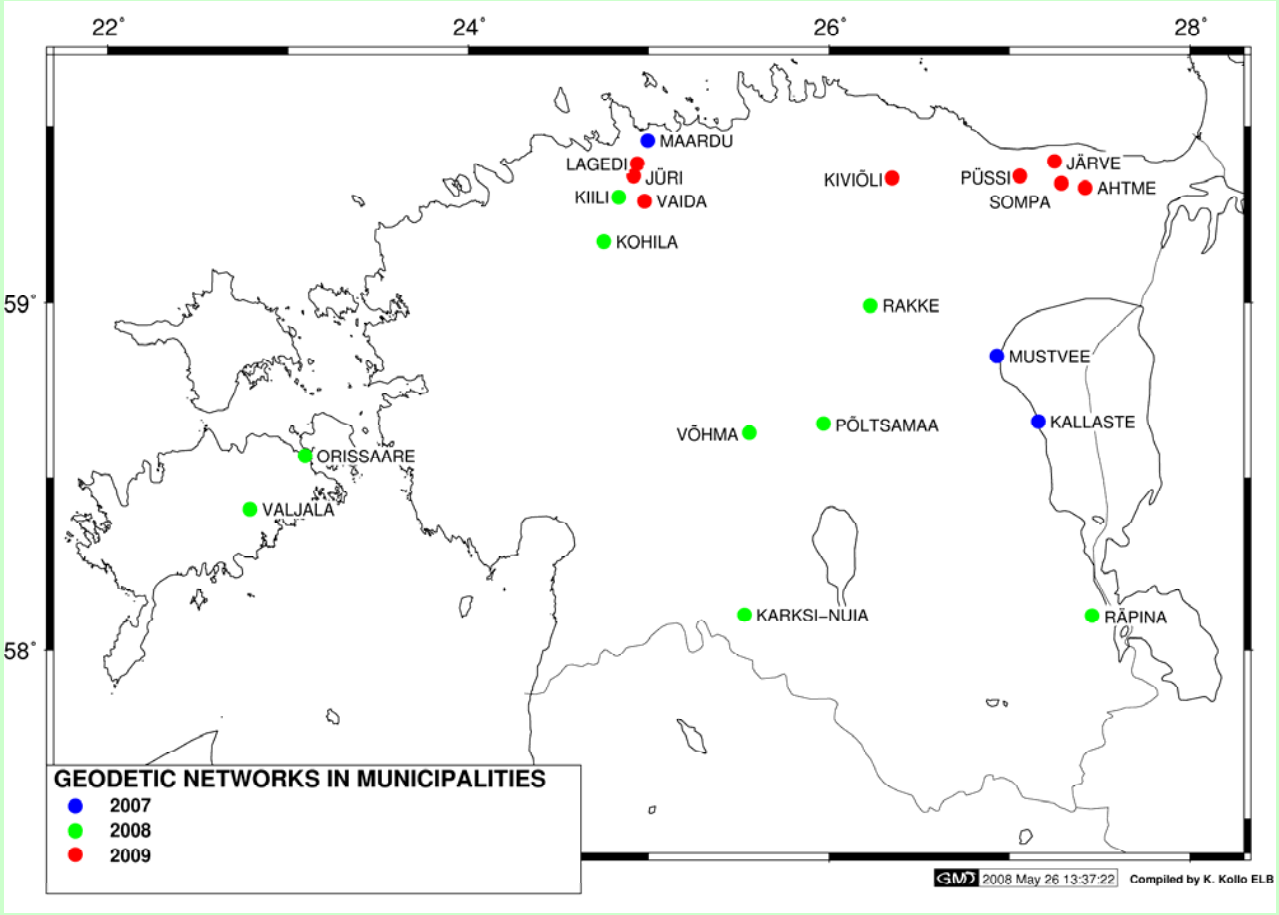


Fig. 4. Reconstruction of Geodetic Networks in municipalities (2007-2009)

Permanent GNSS networks

- Activities in 2007
  - 4 new permanent stations were established – Tõravere, Toila, Kuressaare and Audru.
  - Leica GRX1200GG PRO receivers and Leica AT504GG antennas together with LEIS dome are used
- Activities in 2008:
  - In April three new permanent stations – Tõravere, Toila, Kuressaare were included in EPN.
  - Three new reference stations will be set up – Kärdla, Võru and Mustvee
  - In these locations Leica SR520 receiver and AT504 antenna will be set up

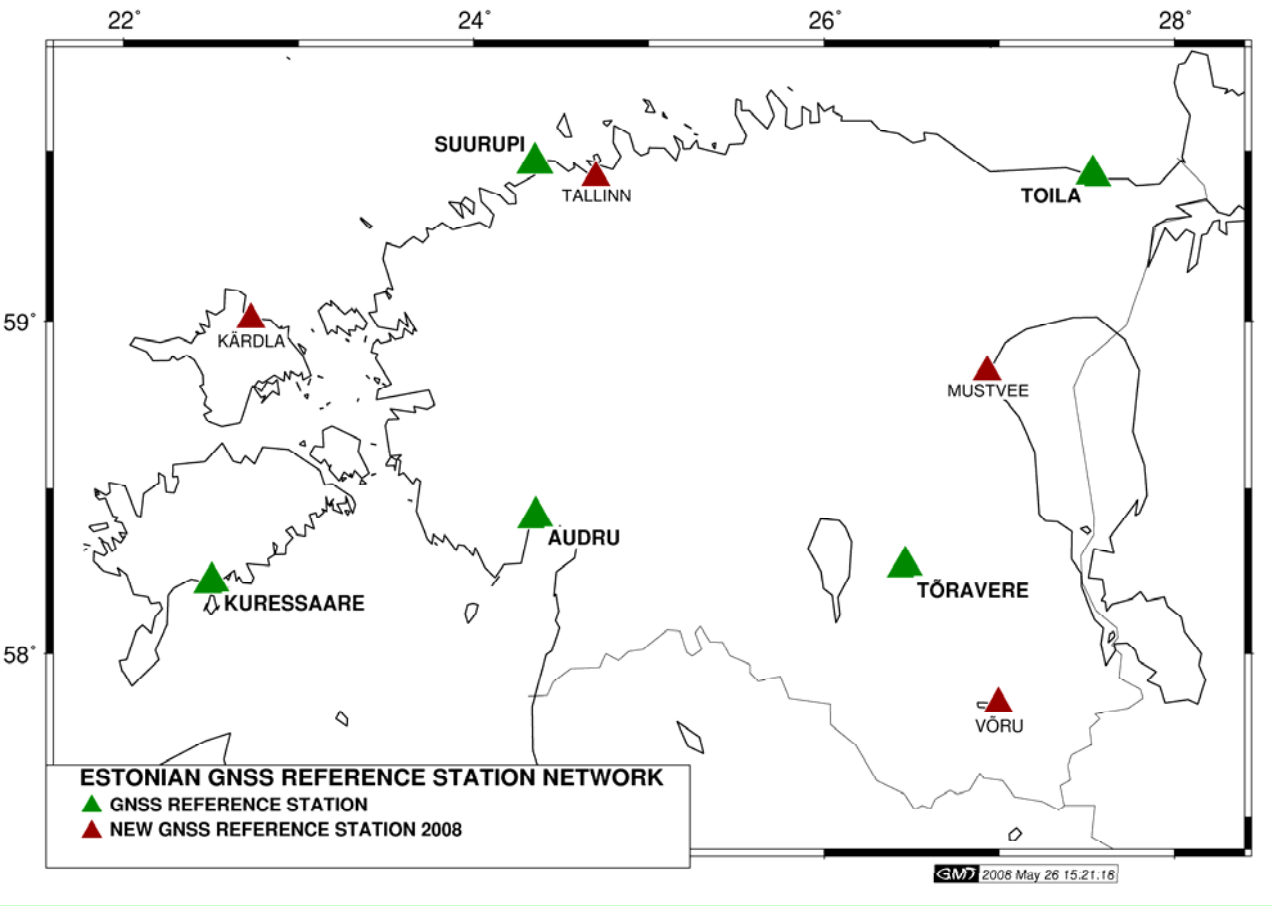


Fig. 5. Estonian GNSS Permanent Station Network

Photogrammetry

- Since 2008 in addition to the aerial camera Leica ADS40 also the laser scanner Leica ALS50II has been used
- The both equipment have been mounted on the aircraft Cessna Grand Caravan 208B

Photo 1. Leica ALS50-II Airborne Laser Scanner

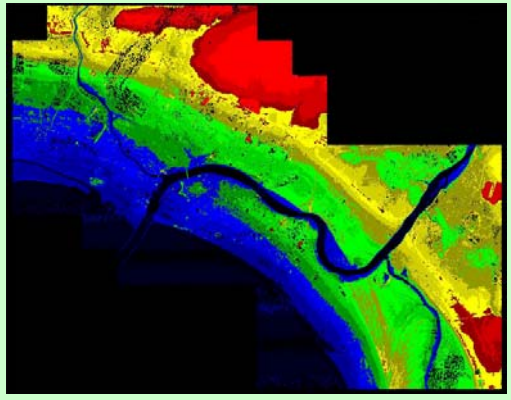


Fig.6. Elevation model of the Pärnu city