REPUBLIC OF ESTONIA
LAND BOARD

National report of Estonia

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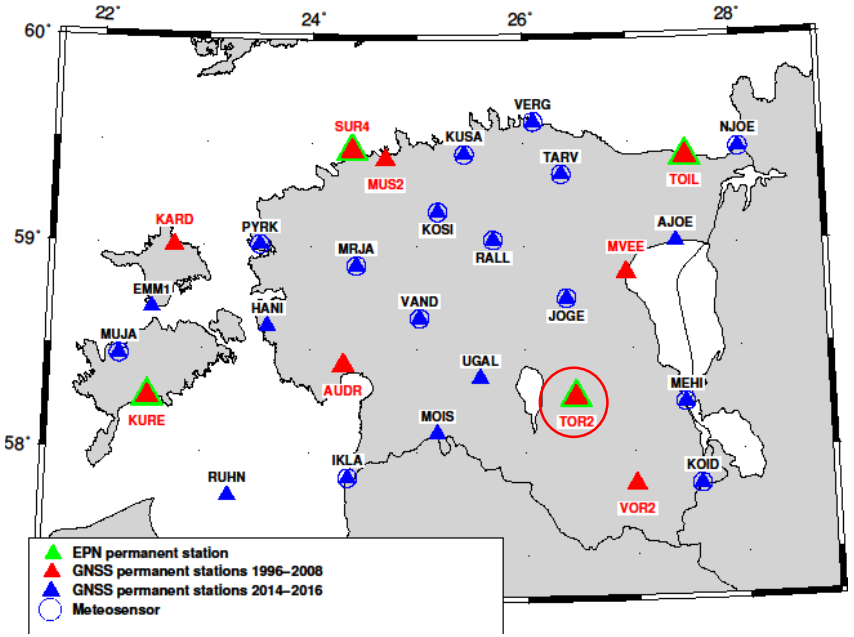
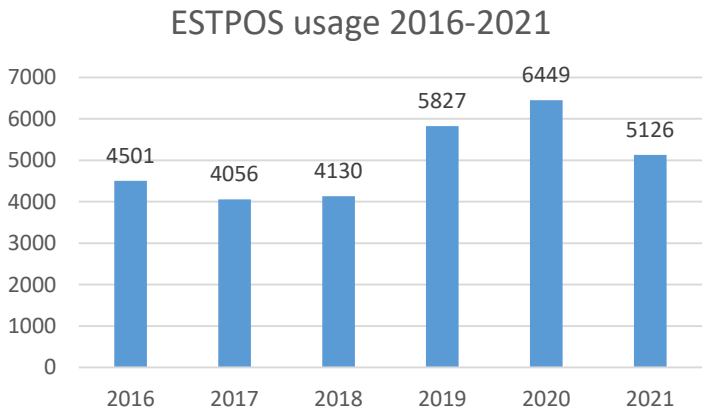
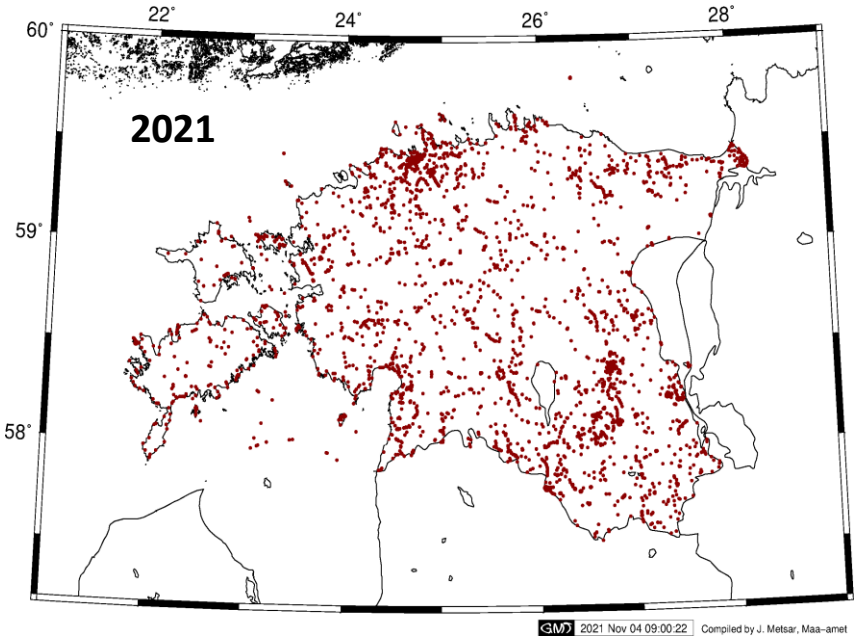
Estonian Land Board

NKG General Assembly, 5-8 September, Copenhagen, Denmark

- ESTPOS management
  - Equipment
  - Two receivers with signal interference detection option
  - Antenna spike
  - Users and services
- GNSS computations for NKG-AC in time, scripts semi-automatic
- ESTPOS vision by Kollo, Rüdja, Metsar, Ellmann 2021
- EPN and EPOS site TOR200EST was decommissioned on 31.08. New site, ca 40 m south from old site position, is almost ready.



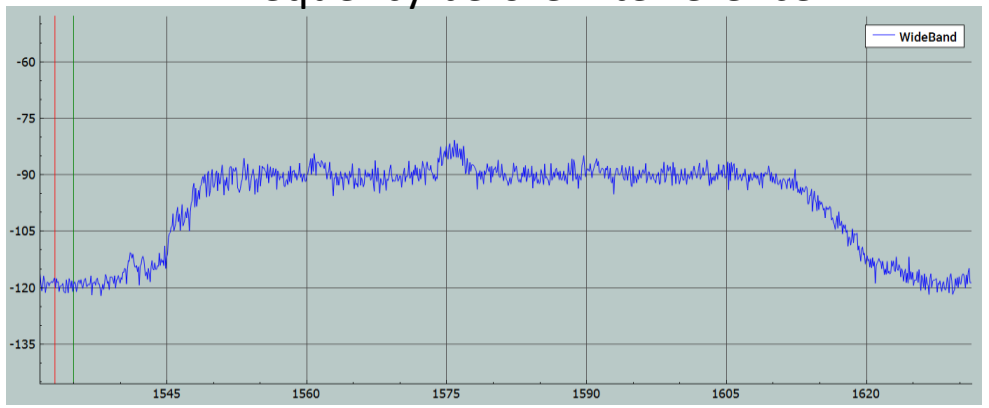




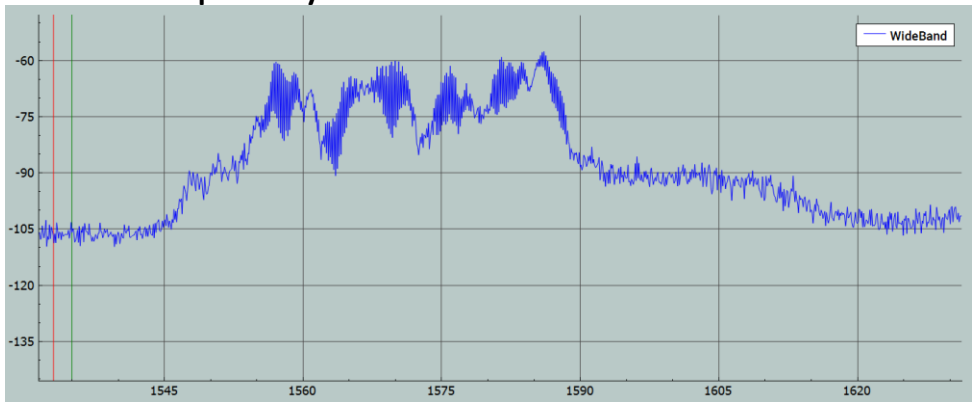
Signal interference investigations

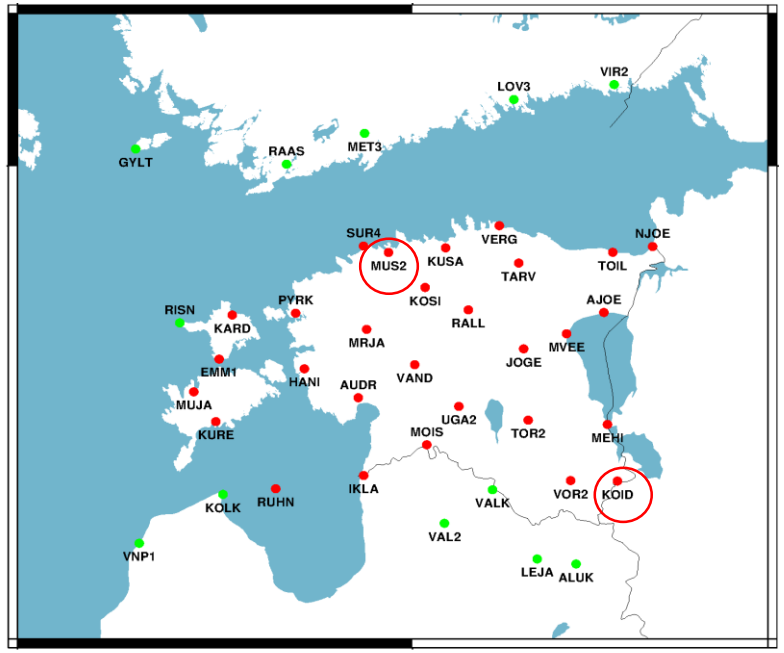
- Two Leica GR50 receivers with Interference Detection option and Interference Toolbox support.
- With the Interference Toolbox it is possible to monitor and analyse interference in real-time. It is also possible to record data for later analysis.
- The Interference Detection option notifies about any detected interference via event email, event email gives information about the time, frequency and power of detected interference

L1 frequency before interference



L1 frequency after interference has started



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1834655 - Eventlog - (GMT+02:00) Helsinki, Kyiv, Riga, Sofia, Tallinn, Vilnius

2022-08-17 19:16:45.06 | Interferences on RF Paths: L1 have ended
2022-08-17 19:11:46.06 | Interference detected - RF Path: L1, Cent. Freq: 1593.07 [MHz], Bandwidth: 0.29 [MHz], Est. Power: -63.98 [dBm], Highest est. power spec. density: -113.16 [dBmHz]
2022-08-17 16:58:37.03 | Interferences on RF Paths: L1 have ended
2022-08-17 16:53:38.03 | Interference detected - RF Path: L1, Cent. Freq: 1586.18 [MHz], Bandwidth: 0.29 [MHz], Est. Power: -59.07 [dBm], Highest est. power spec. density: -107.96 [dBmHz]
2022-08-17 16:53:07.03 | Interferences on RF Paths: L1 have ended
2022-08-17 16:48:10.03 | Interference detected - RF Path: L1, Cent. Freq: 1586.15 [MHz], Bandwidth: 0.51 [MHz], Est. Power: -60.27 [dBm], Highest est. power spec. density: -109.68 [dBmHz]
2022-08-17 16:43:07.02 | Interference detected - RF Path: L1, Cent. Freq: 1586.18 [MHz], Bandwidth: 0.44 [MHz], Est. Power: -59.16 [dBm], Highest est. power spec. density: -108.52 [dBmHz]
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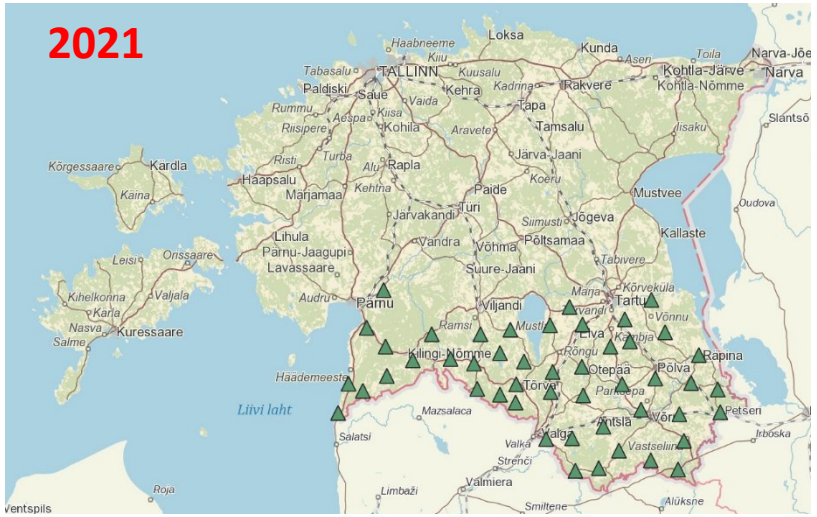
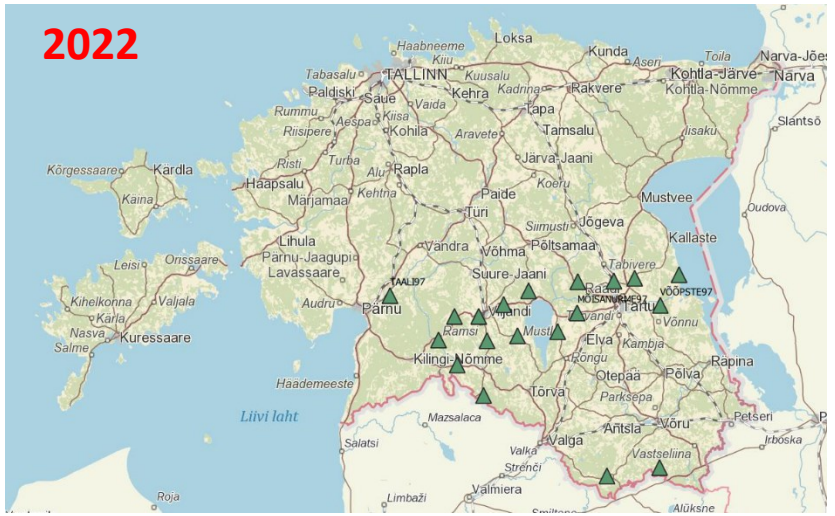
Remeasurement of national geodetic network

- AIM: quality assessment, transformations, CORS integration
- 2020, 2021 (GeoRefAct), 2022
- Static GNSS
- 6h sessions
- 7 campaigns performed





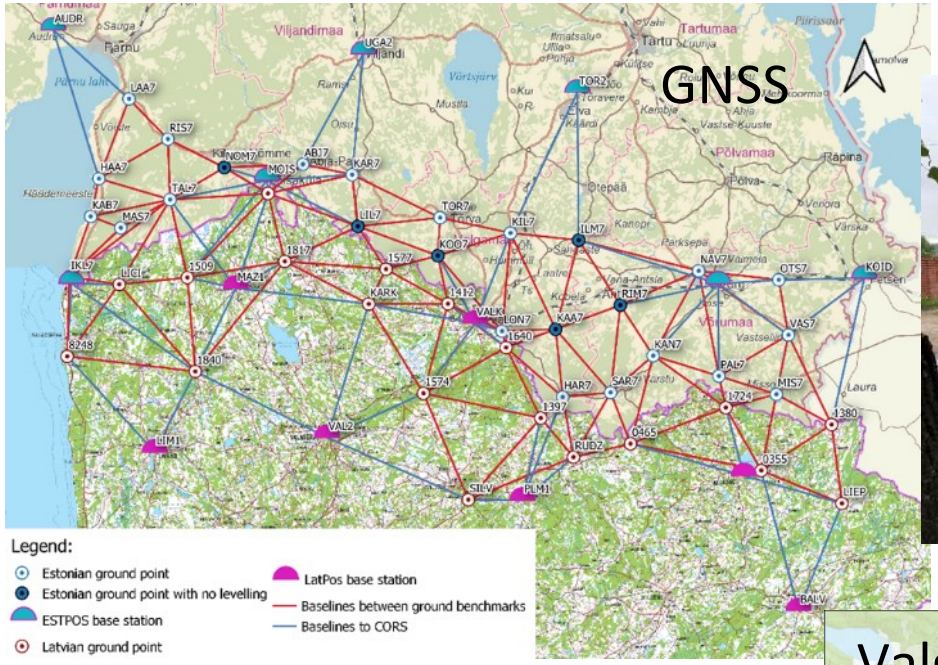
Estonian-Latvian cooperation

- Interreg V-A Estonian-Latvian programme
- Project „Harmonization of Estonian and Latvian geodetic systems in border areas“ (GeoRefAct)
- Project period 2021-2022
- Estonian Land Board and Latvian Geospatial Information Agency
- Activities:

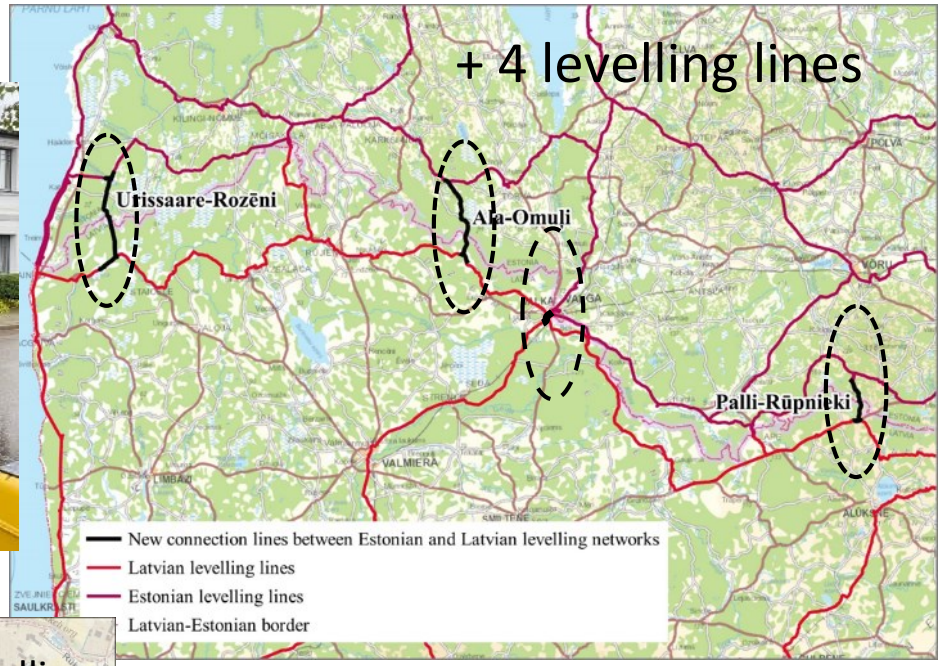
  Measurements and computations of national GNSS and levelling networks in border area, local network of twin-city Valga/Valka and gravity survey in Northern Latvia

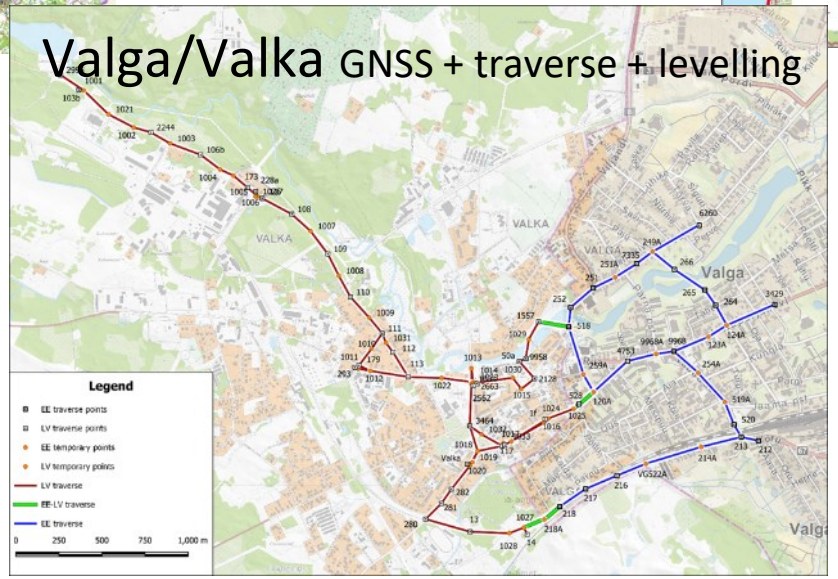
  Results: coordinate and height transformation models including web-based services

GeoRefAct 2021



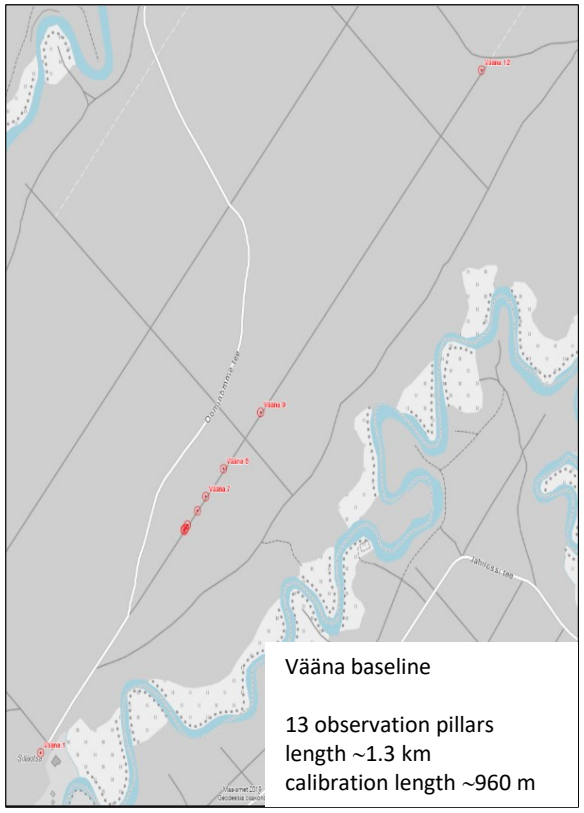
Directors-General in Valga/Valka





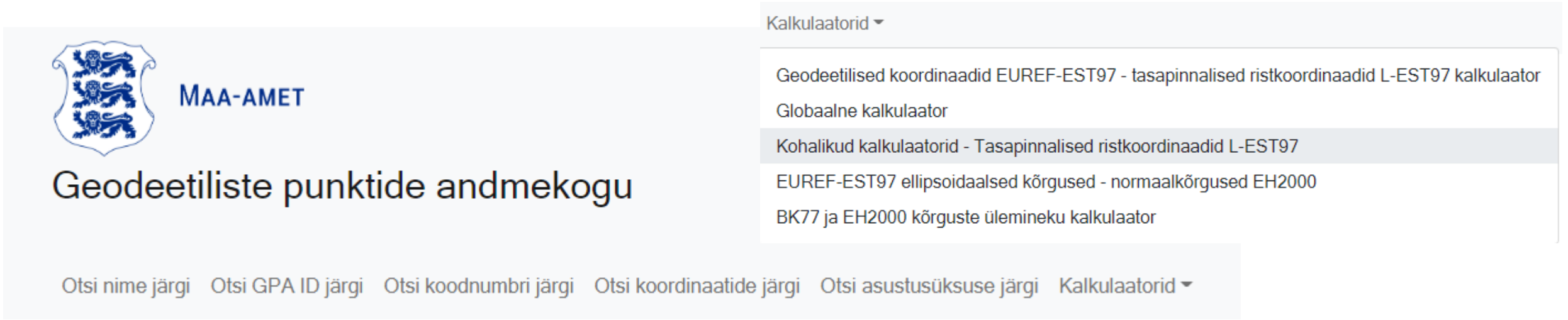
Geodetic metrology

- Meteo instruments:
  - the devices are hardware and software assembled
  - The data processing software is updated
  - Measurement forms prepared
- Calibration measurements of LGIA equipment 01.11 - 04.11.2021, ELB equipment May 2022
- Initial consultation with the Ministry of Justice on legal analysis
- The requirements for a certified metrology laboratory have been reviewed
- Consultations with AS Metrosert regarding the Maa-amet as a legal metrology laboratory began
- Consultations in FGI (Nov 2021)



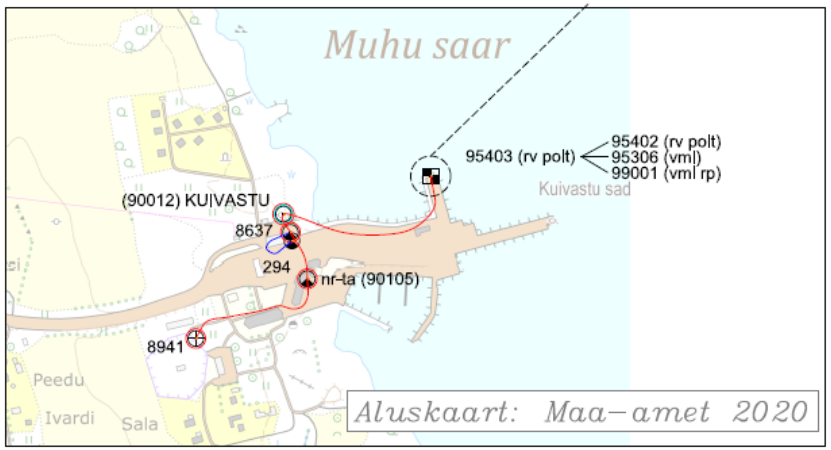
Geodetic Point Database

- 35 000 geodetic points in the geodetic points database
  - 45% from national networks, 55% from local networks
- Local authorities are obliged to take decisions on local geodetic infrastructure
- Legislative changes are planned
- Discussion about the rearrangement of geodetic points database
- New web interface for geodetic point database from July 2022



Other activities

- Outsourced high-precision levelling
  - 2020: 12 km (near harbours of West-Estonian islands)
  - 2021: 33 km (Kilingi-Nõmme, Meemaste, Navi)
- Revision of geodetic legislation in Estonia
  - Needs to be updated
- Maintenance of geodetic marks
  - Previously outsourced,
  - starting from 2021, ELB performs itself
- Coordination of plans and construction projects in terms of geodetic marks
- Coordination of projects and reports of geodetic works
- Updates of geodetic instruments
  - digital level Trimble DiNi, total station Leica TS60, 3 meteosensors with field computers, fieldbook for measurements, one upgraded and one new GNSS permanent station receiver Leica GR50

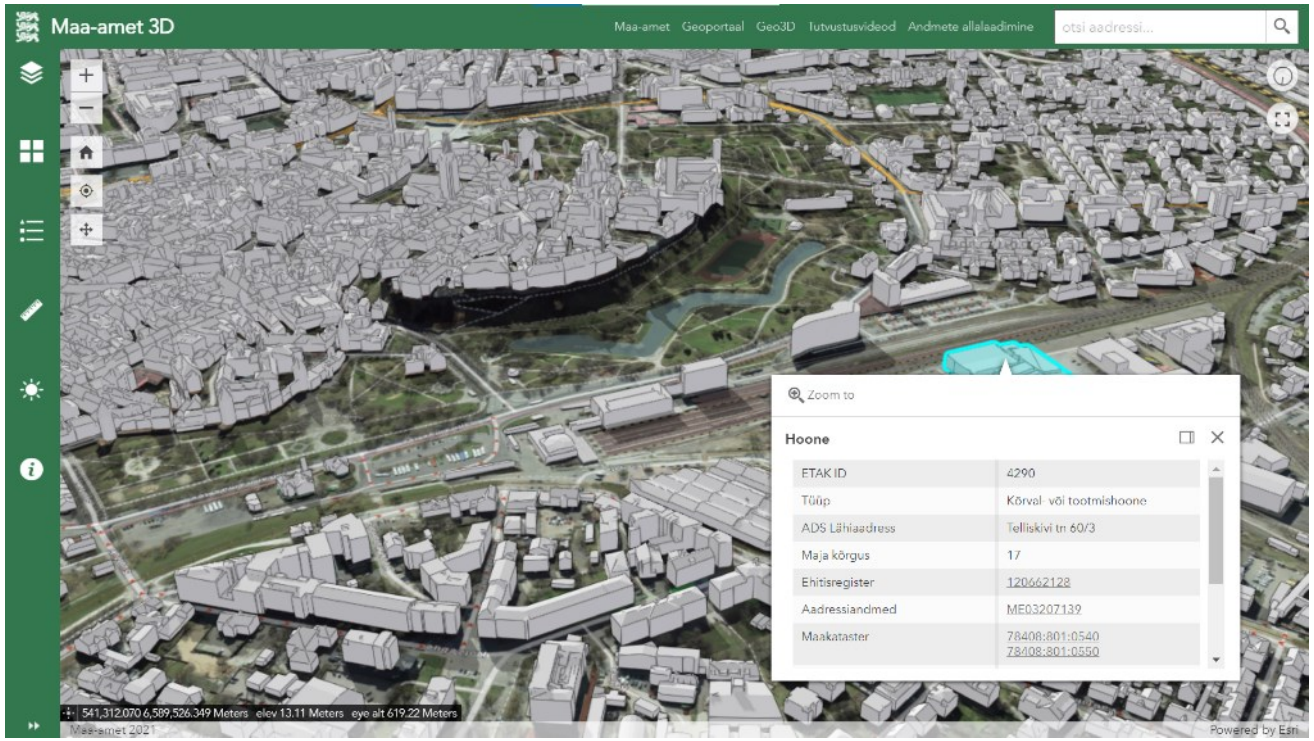


Moving Toward the Digital Twin

- 3D Estonia, country-level coverage
- Fully automated processing

31 March 2021 https://3d.maaamet.ee/kaart/

Department of Geoinformatics



Hanno Kuus

Vision: Reality and augmented reality application: 3D buildings, building information, route information

Kirke Narusk ja Andres Kasekamp