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Geomatics in the Estonian Land Board

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Land Board

- 16.01.1990
- 308 employees
- 19 departments

- www.maaamet.ee

- geoportaal.maaamet.ee
- inspire.maaamet.ee

Estonian Land Board

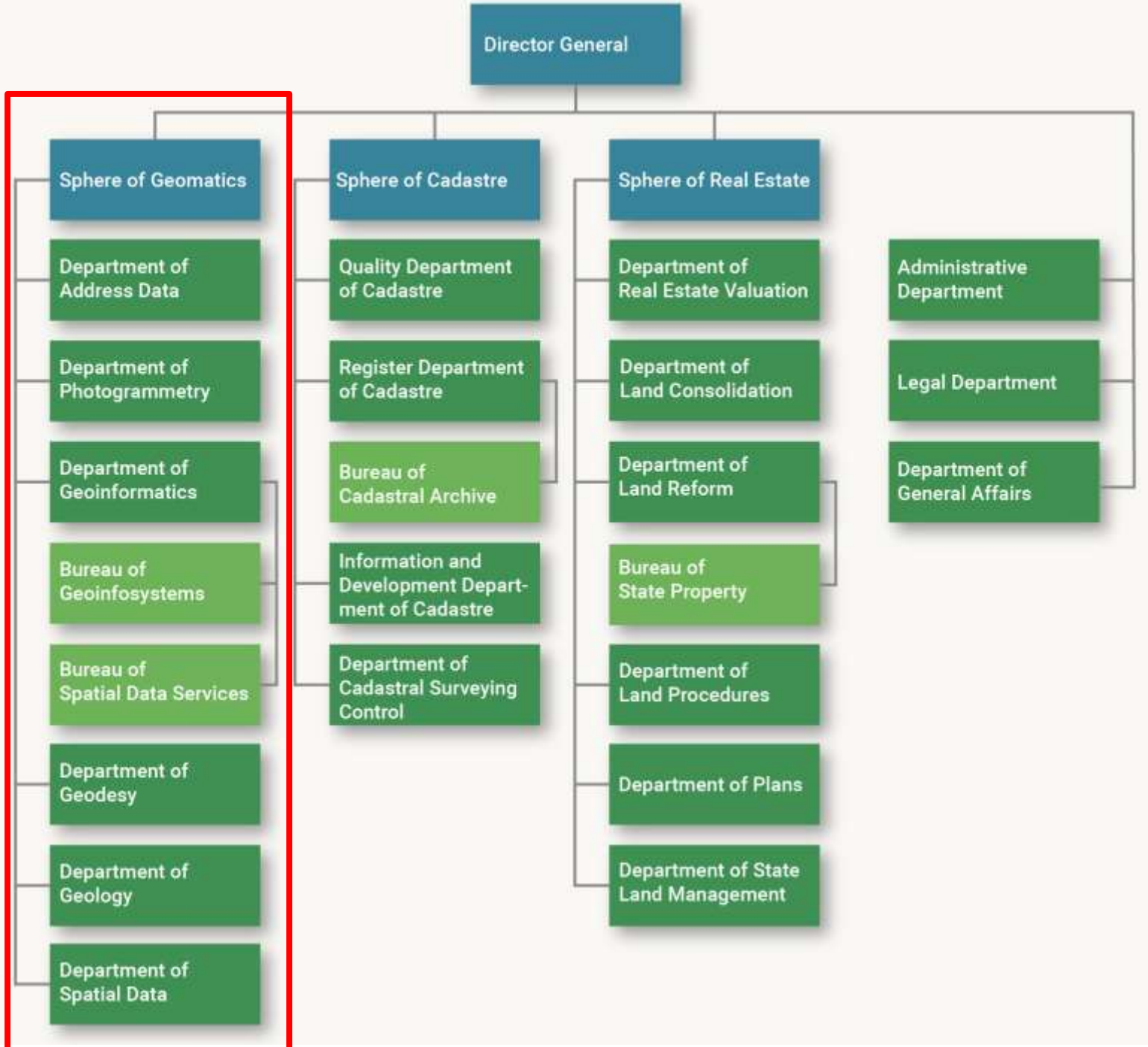
- Governmental agency responsible for the national geodetic infrastrucuree
- National centre of competency in land related issues
- Largest producer, manager and distributor of spatial data
- Biggest provider of spatial data services
- Cadastral registrar

Focus on:

Spatial data acquisition and dissemination.

photogrammetry, geodesy, geology & topography (national geodetic networks, mapping, providing national topographic data and maps to the society)

geoinformatics (management of spatial data, provision of spatial data services)



Geodetic infrastructure

National geodetic GNSS network

Densification (GNSS) network

High-precision levelling network

Gravimetric network

GNSS permanent station network

Geodetic networks in municipalities

Geodetic network

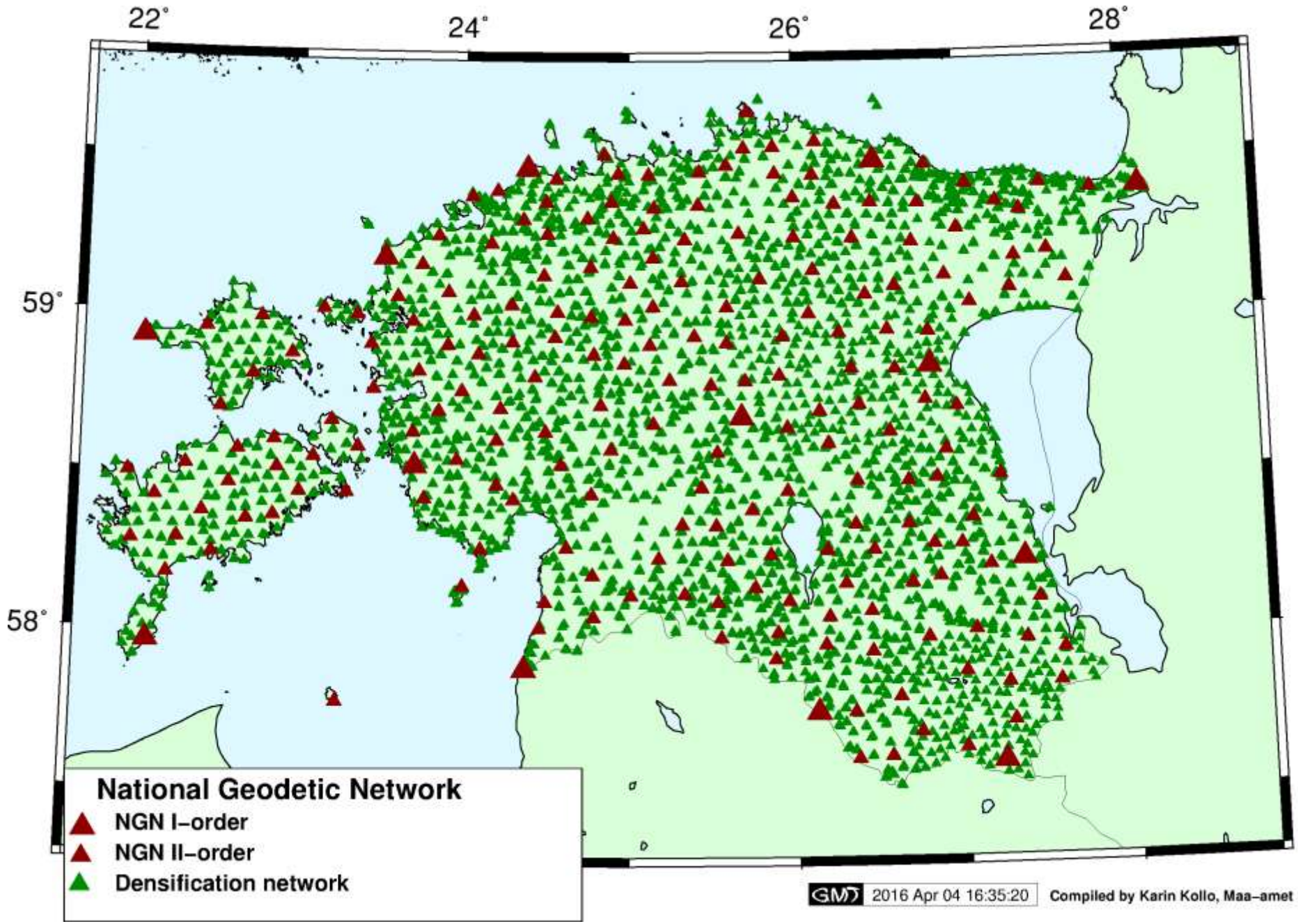
Established 1997-1998, altogether 212 points

I order network corresponds to the B class standard by the EUREF classification

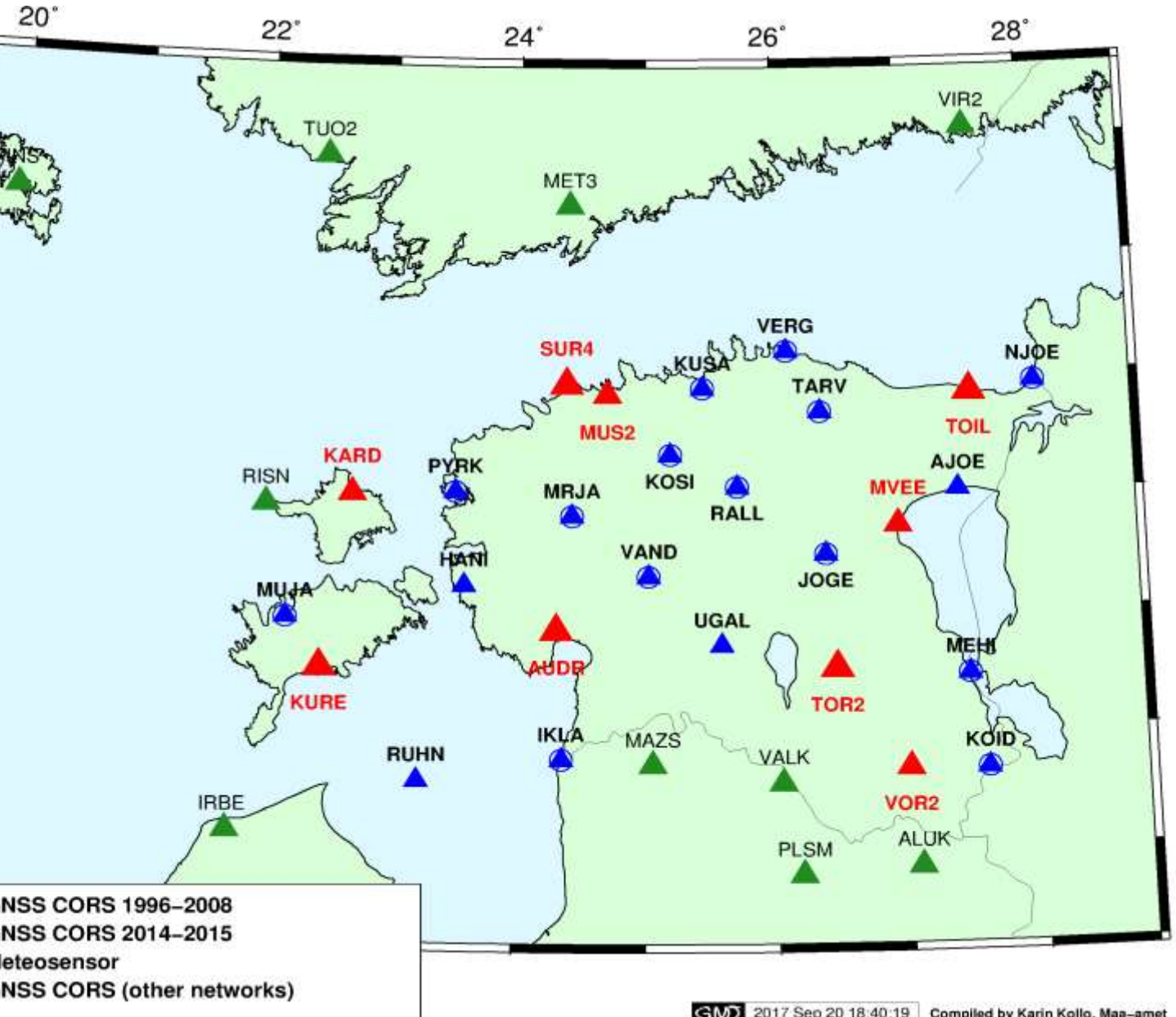
Densification network: established 1992-2001, altogether 3900 points

Geodetic network

Accessible via GPDB – free!



GNSS-CORS Network ESTREF / ESTPOS



2014-16: reconstruction of GNSS-RTK permanent station network, Estonian-Swiss cooperation programme

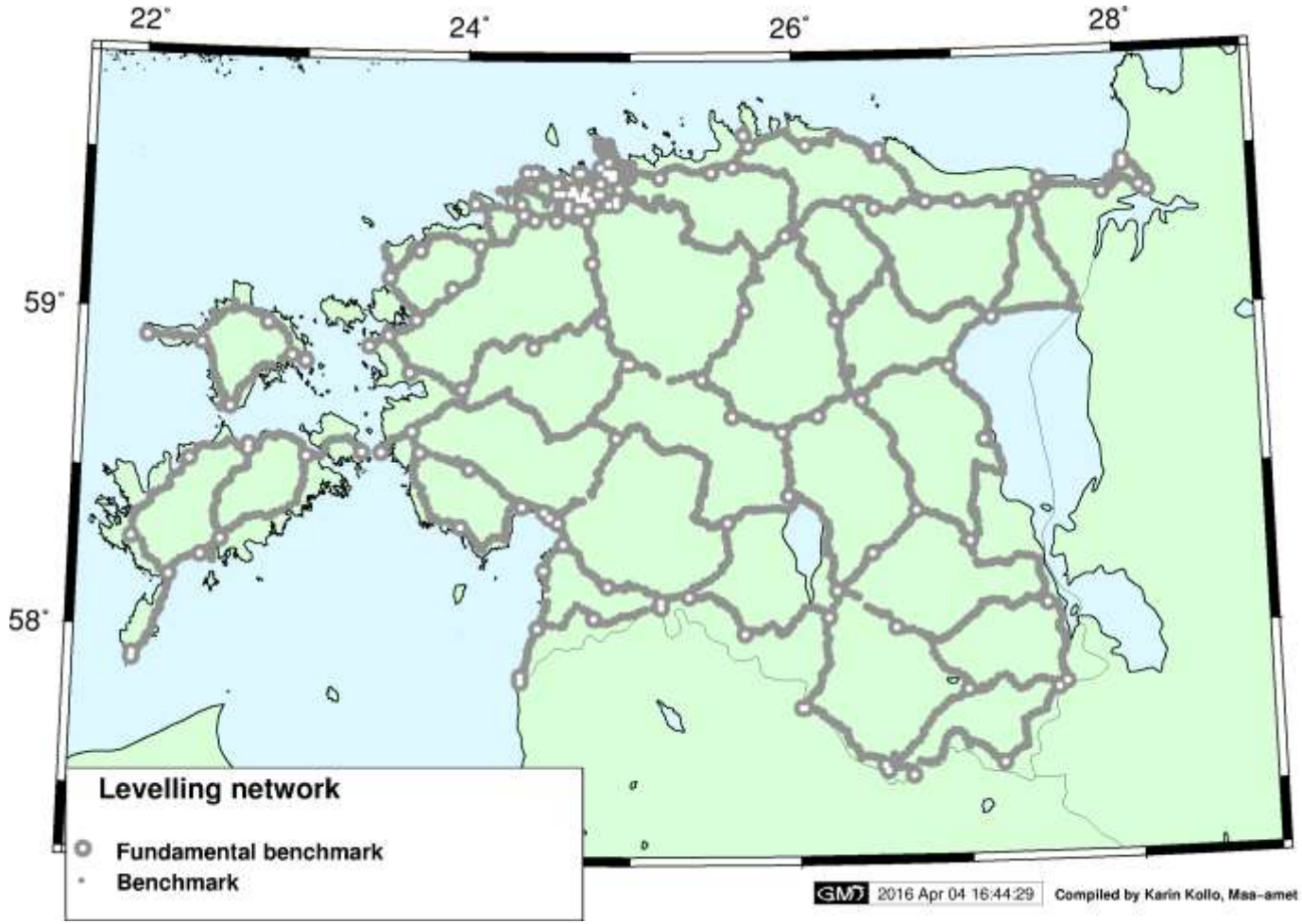
Offers RTK-GNSS corrections for a small number of authorised users

24 stations, EPN (4)

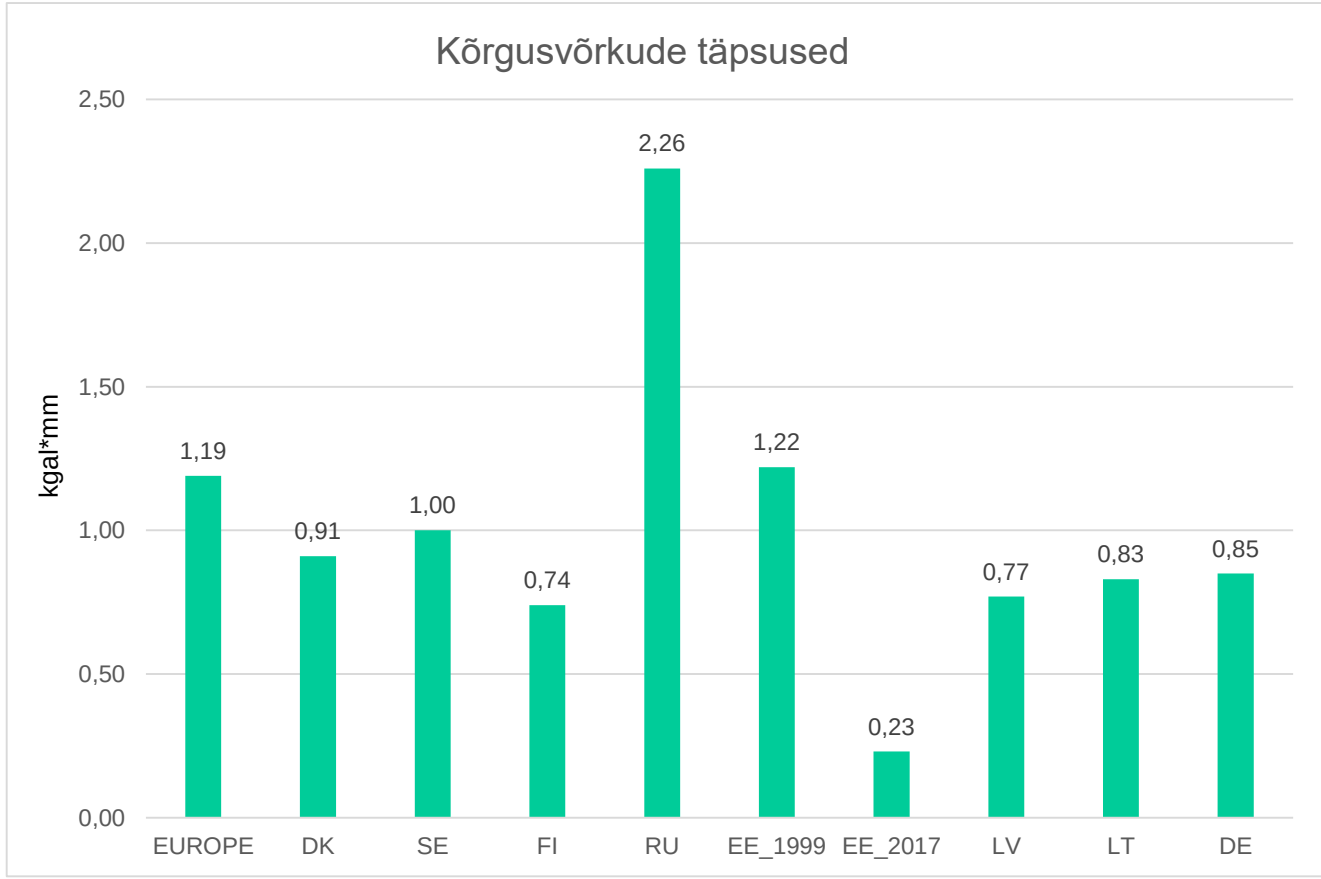
gnss-rtk.maaamet.ee/SpiderWeb

Levelling Network – renovation 2003-2016

- Levelled about 4000 km, 3100 benchmarks with distance 1,4 km, 45% new benchmarks
- Accuracy: difference in heights 0.23 kgal*mm from free network adjustment
- Included: points from gravity network, NGN and tide gauges

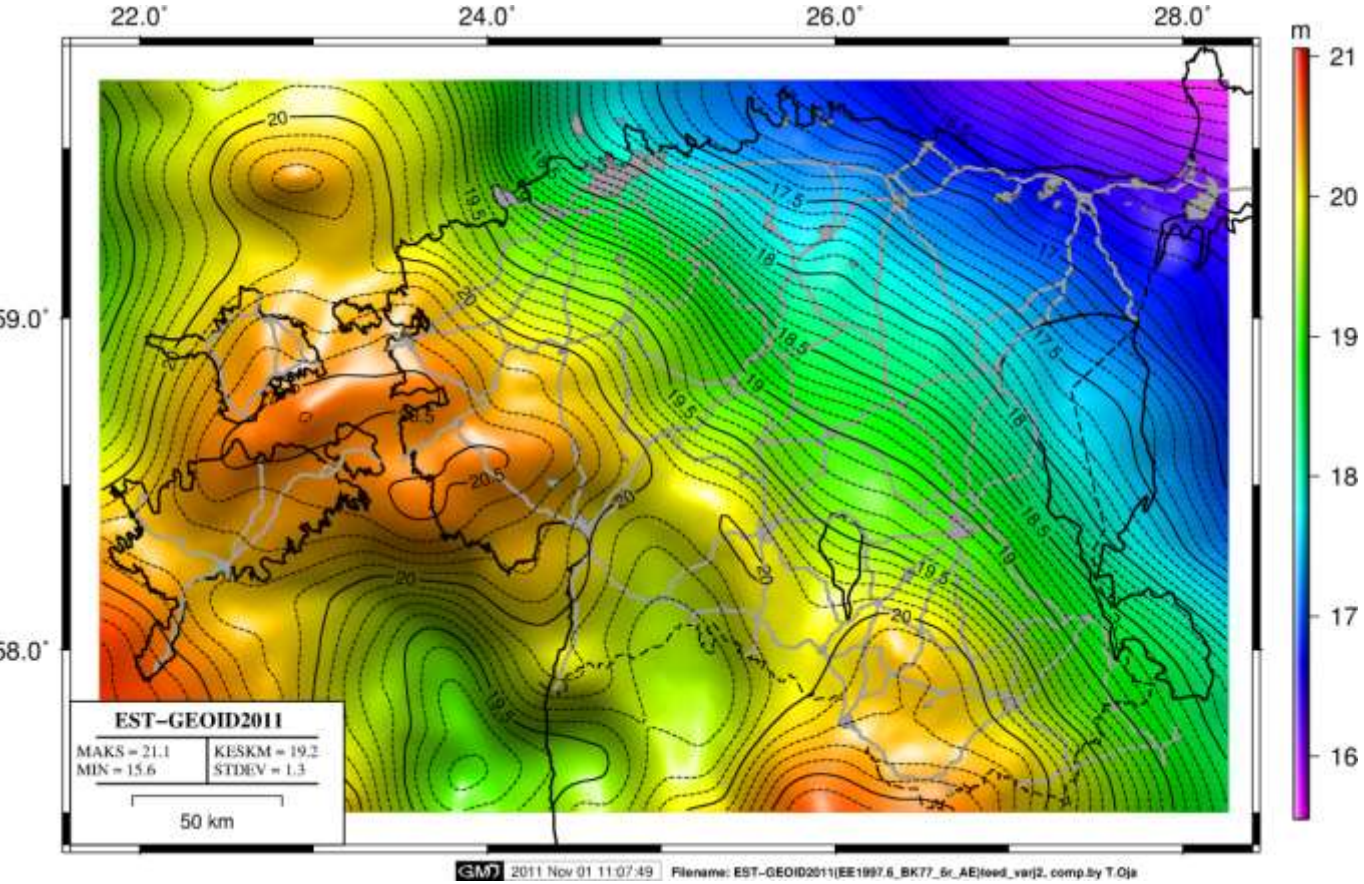


Accuracy (wrt to other countries)

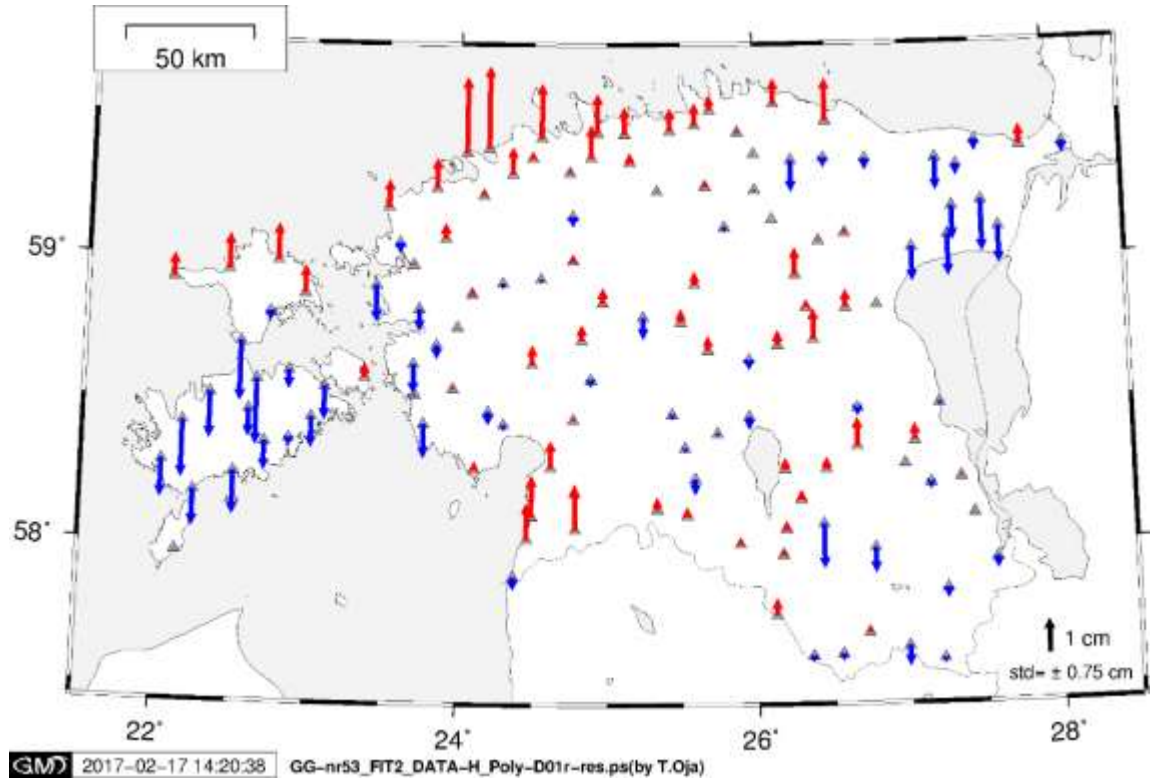


Sacher, 2012

EST-GEOID2011



Post-fit residuals, std 0.75 cm

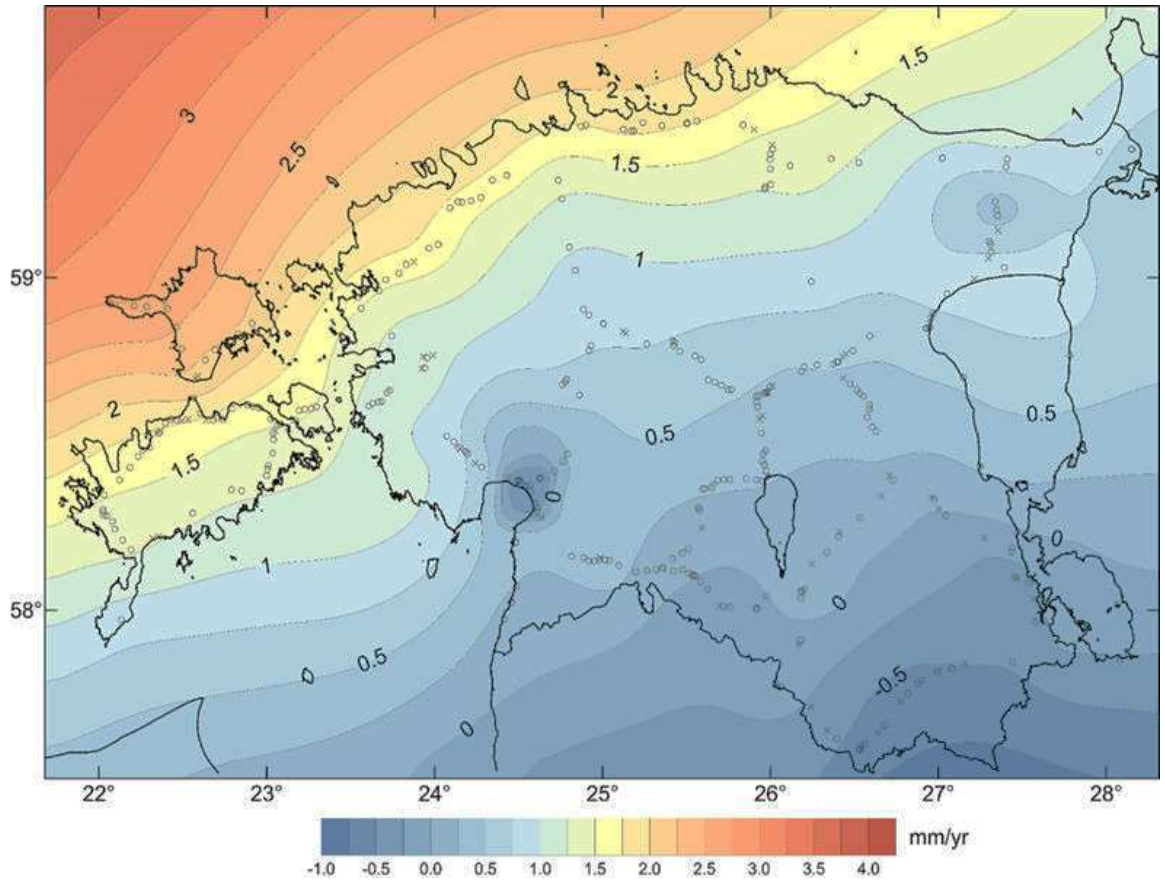


Transfer to European EUVN height system (Amsterdam) from the obsolete Kronstadt tide-gauge zero, 01.01.2018

BK77 – EH2000

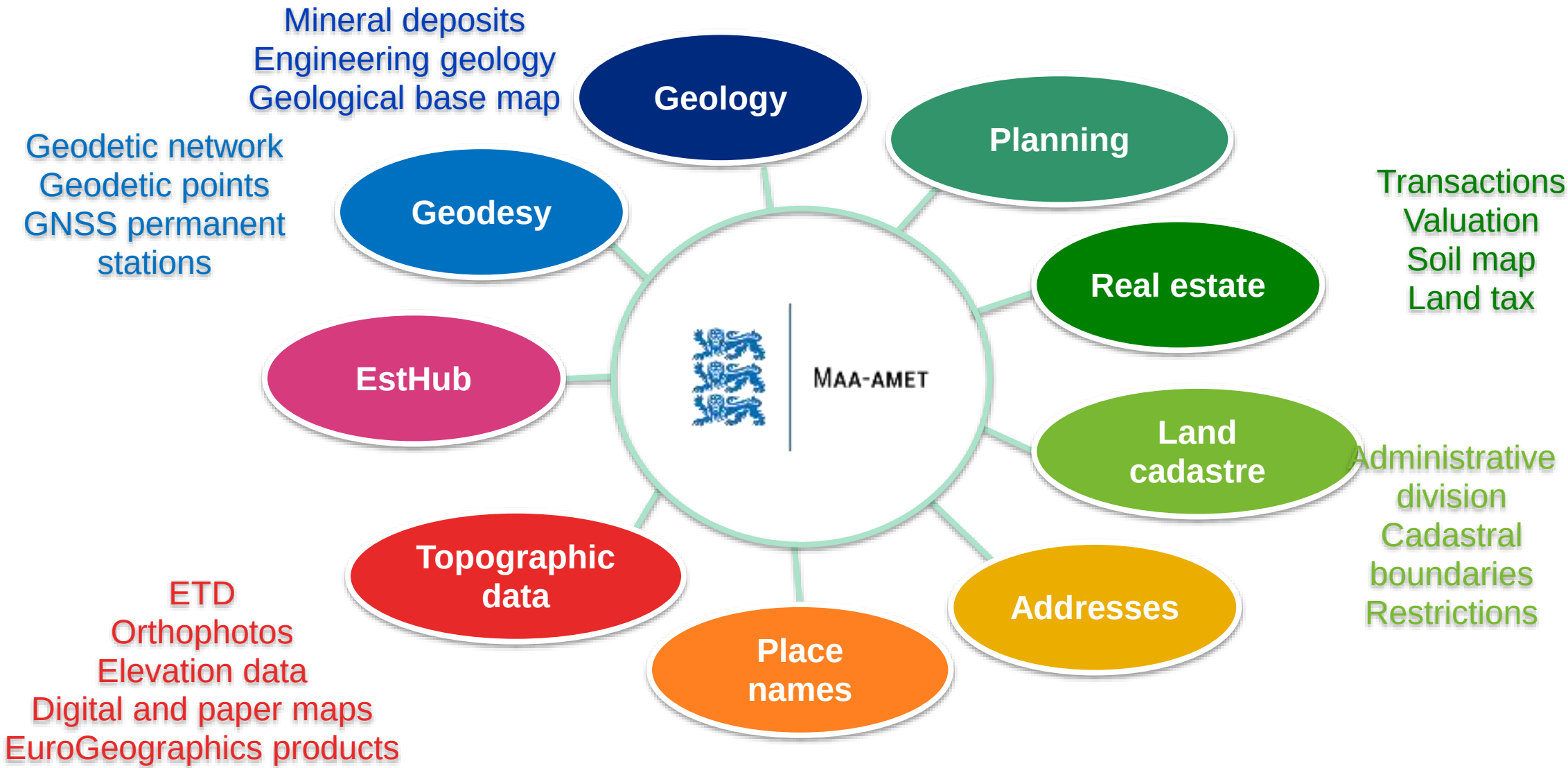
Kaart Karin Kollo

Correlates with the EST2015LU Land Uplift model



Kall, T., Liibusk, A., Wan, J., Raamat, R. (2016) Vertical crustal movements in Estonia determined from precise levellings and observations of the level of Lake Peipsi. Estonian J. Earth Sci., 65 (1)

Land Board as a data producer and manager



EUREF2019 symposia in Tallinn 22-24 May 2019

Everyone is welcome!!!

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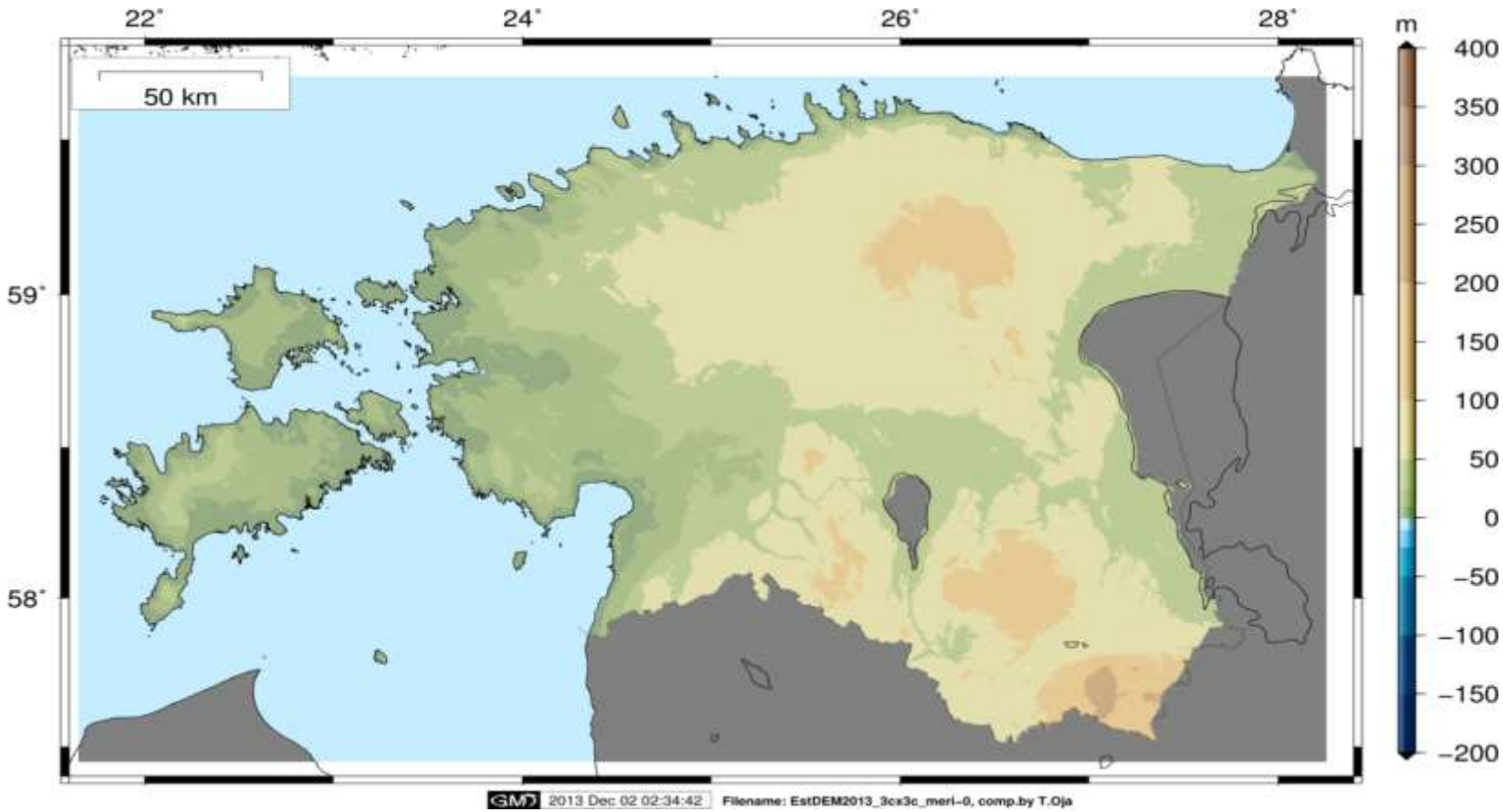
EUREF2019 Symposia

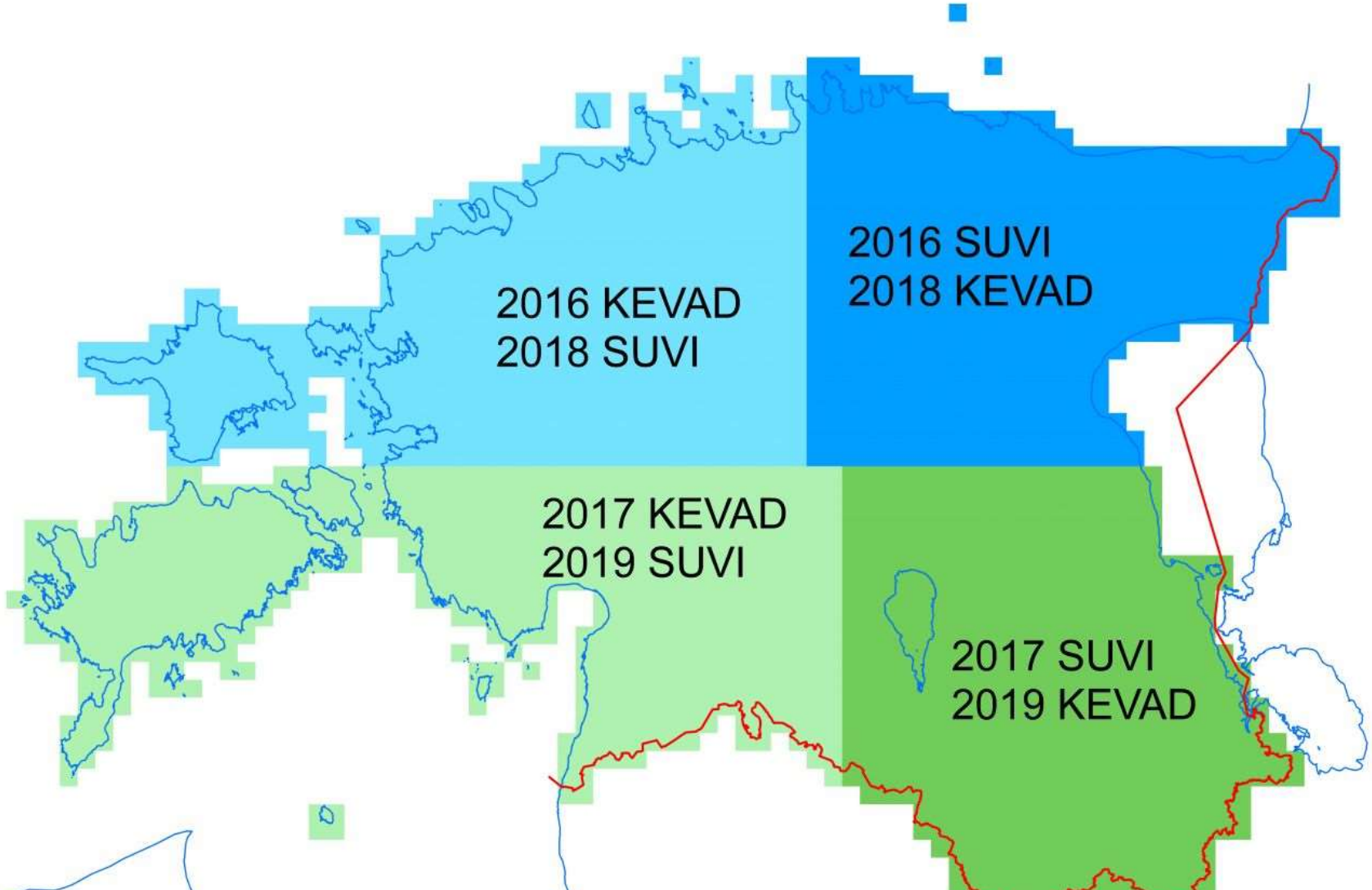
Photogramm-metric and Lidar surveys

EstDEM2013


22°
24°
26°
28°
59°
58°
50 km
m
400
350
300
250
200
150
100
50
0
−50
−100
−150
−200
GMT 2013 Dec 02 02:34:42
Filename: EstDEM2013_3cx3c_meri-0, comp.by T.Oja

New vs. old

Flight plan


2016 KEVAD
2018 SUVI
2016 SUVI
2018 KEVAD
2017 KEVAD
2019 SUVI
2017 SUVI
2019 KEVAD

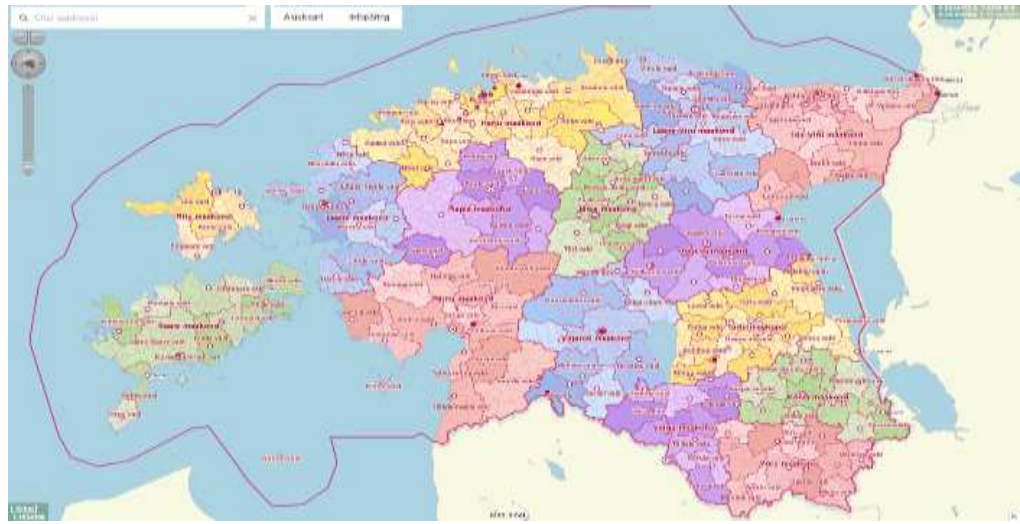
Land Board's challenges

New aerial sensor already acquired, new airborne laser scanner in the stage of implementation

Transition to a new height system

Administrative reform

EstHUB



Land Board and GIS

Geoinformatics in Land Board

Land Board as the centre of spatial data

Land Board’s geoinformatics is of great benefit to state agencies and local governments, companies and citizens

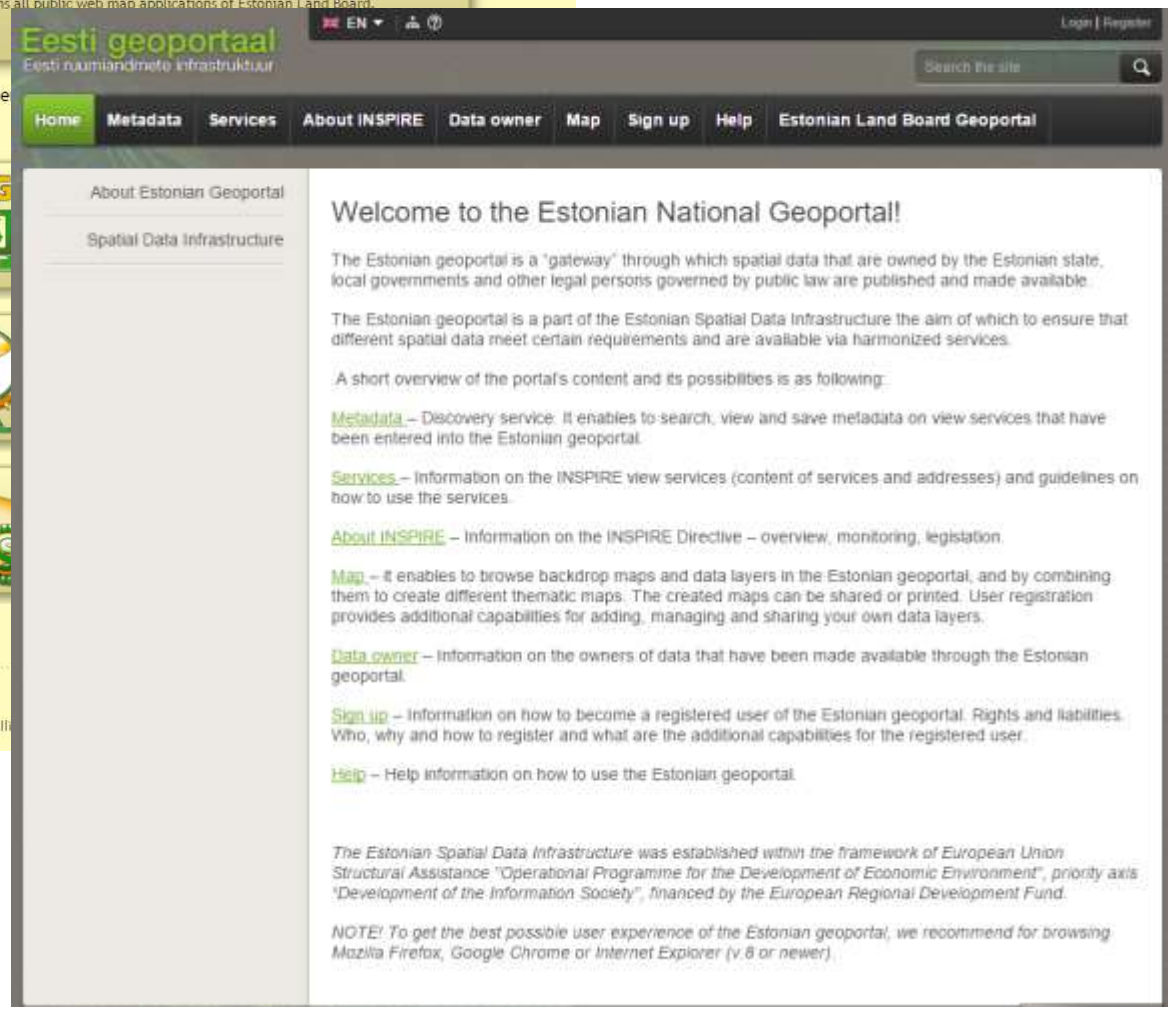
Geoportals

- Today Land Board manages two geoportals
  - Land Board geoportal (geoportaal.maaamet.ee)
    - From 2009
    - Self tailored
    - Oriented to Land Board data and services
    - Map application is X-GIS

  - Estonian geoportal (inspire.maaamet.ee)
    - From 2012
    - Outsourced
    - Part of first INSPIRE development project
    - Bringing together all spatial data trough metadata and services, produced by public sector, including INSPIRE compatible services
    - Gateway to metadata and spatial data. You can search (WCS), view (WMS) and also download (WFS, AtomFeed) the data
    - Part of Estonian NSDI

Land Board Geoportal

Estonian Geoportal



Usage and future

- Land Board geoportal
  - Very popular, especially map applications

- Estonian geoportal
  - Primary use is to publish INSPIRE compliant metadata and services

- In future plans is join two geoportals into one interface.
- It should be done by end of 2017

View Services

- Usage, for example in february 2017

  - Total Hits 21 715 113
  - Total Files 21 424 151
  - Total Visits 452 305
  - Total KBytes 2 222 886 644

- It makes an average of **700 487** requests per day (most of all **1 361 549** requests per day)

What about Open Data?

Not all data what we producing is Open Data but …
… many important data theme are:

- Addresses
- Place names
- Geological map
- Administrative borders
- Soil map

- Topographic database data, Cadaster data, ortophotos, height data is paid data

- All **view services** and **map applications** are **free** for use

Web Services

- View services – WMS, WMTS, map applications
- Different register services
  - Cadaster
  - Address register – search, update, harmonization, …
  - Place name register
  - Geodetic points and geodesy calculators, …
  - …
- X-ROAD services – registers data is available trough X-ROAD services. Currently updating to version 6.
- Geocoding services – one address or many
- Different kind of URL based queries

View Services

- Support of WMS and WMTS protocols
- Free use for everybody
- Ortophotos (also historical), map, hybrid map, height data, relief, cadaster boundaries, restrictions, soil map, historical topographic maps, …
- Almost all data is available trough web services
- If used somewhere, only requirement is to reference to Land Board
- In Estonian L-Est97 coordinate system, but there is separate service for Google Maps.

Hybrid

Different maps from view services

Ortophoto

Raster map

Vector map

Height map

View Services

- Used in most public sector web map applications
  - Public transportation portal http://www.peatus.ee/
  - Forest register http://register.metsad.ee/
  - Tallinn map service http://kaart.tallinn.ee/
  - Agricultural Register web portal https://kls.pria.ee/kaart/
  - Portal for local authorities https://www.kovtp.ee/
  - … and much more smaller portals
- And also in privat sector map portals
  - Delfi news portal map: http://kaart.delfi.ee/
  - Number of mobile applications
  - … (and counting)

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Thank you!

www.maaamet.ee
geoportaal.maaamet.ee

Data timeliness in web services

- Data is updated once in day
  - Buildings
  - Roads
  - Hydrography: rivers, lakes, …, but coastline is fixed for 8 years
  - Cadaster data
  - Restrictions
- Data is updated once in week
  - All other topographic database data
- Data is updated once in year
  - Ortophotos
  - Rasterized base map in 1:10 000