Agency for Data Supply and Efficiency

National Report Denmark

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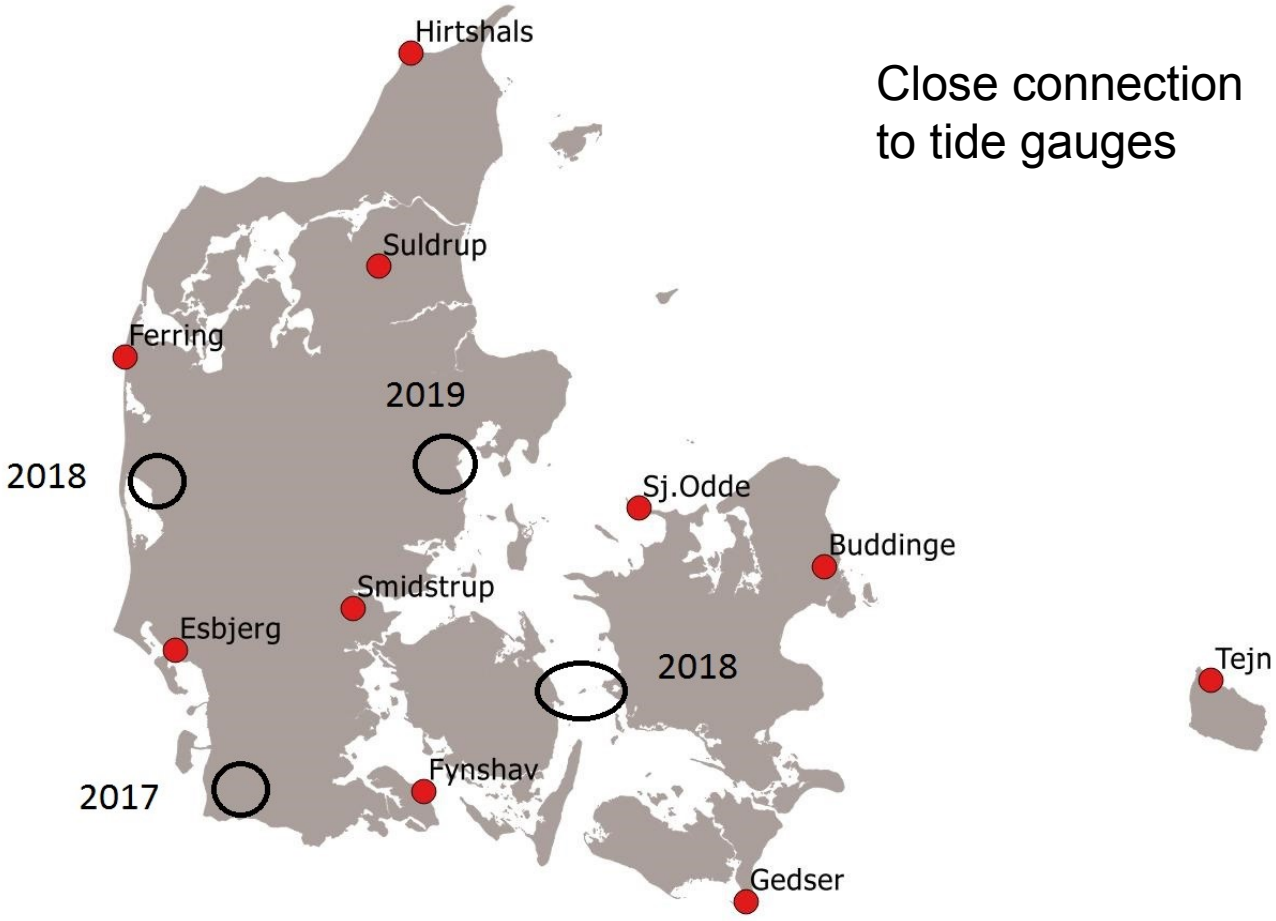
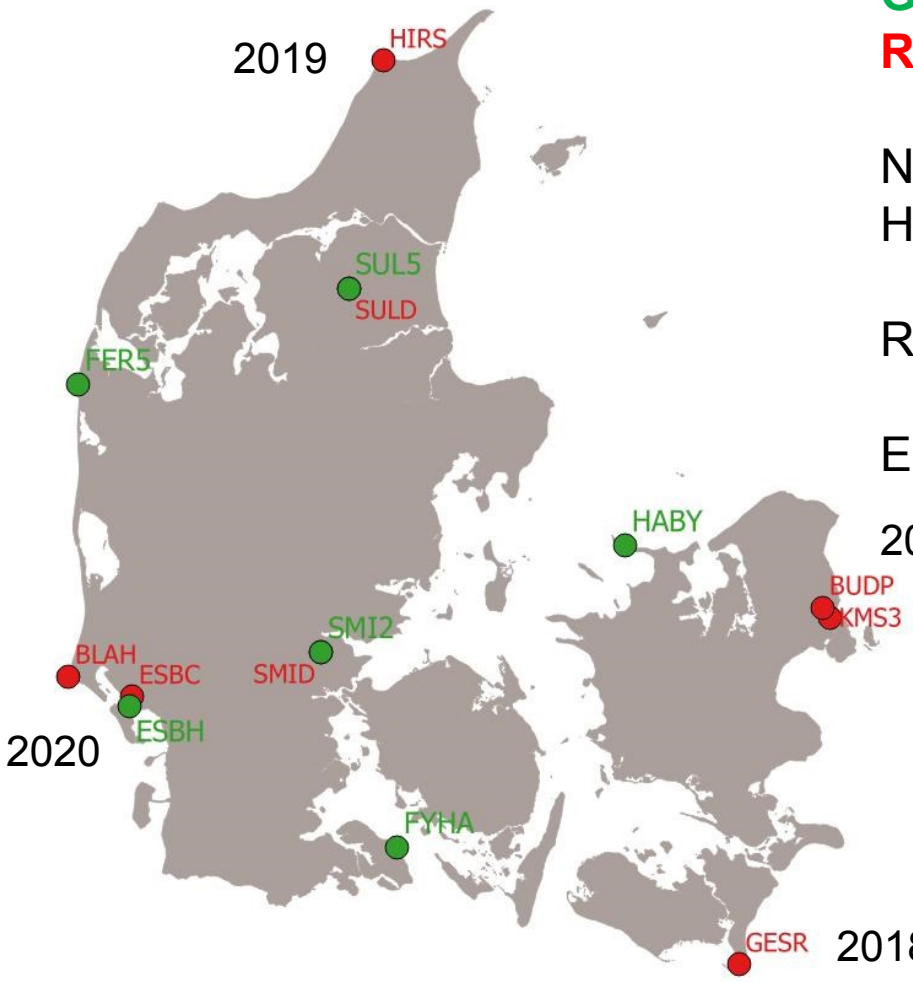
New permanent GNSS stations



Close connection
to tide gauges

New GNSS twin stations



Green: Ready for Galileo
Red: Only GPS and GLONASS

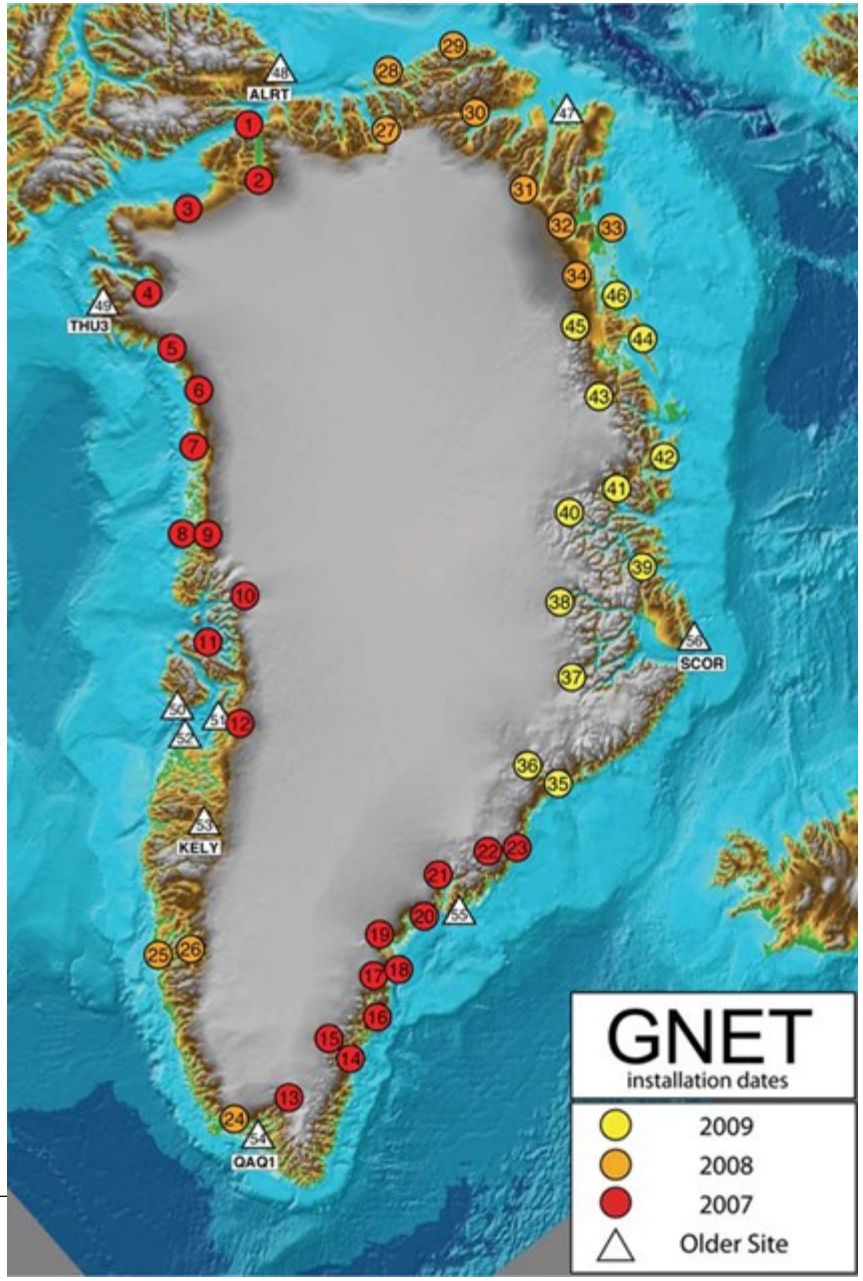
New twin stations at BUDP, GESR, HIRS, ESBC

Rinex3 – to be implemented

EPN densification (app. 15 stations)

GNET (Greenland)

- 15 DTU/SDFE GNSS-stations
- 45 GNSS stations funded by National Science Foundation (NSF) until 1/1 2016
- Jan 2017: Meetings with NSF + GNET workshop
- Plans: Consortium (USA/DK)
- Goal: **keep GNET running!**



Greenland: new geoid model and height system

- Release December 2016 by DTU Space
- The geoid is fitted to MSL in Nuuk
- The geoid defines the height system
- 5-10 cm accurancy expected (where gravity campaigns has been carried out.)
- User workshop in 2017 in Greenland

Plans for a 5 mm geoid model in Denmark

Initial thoughts:

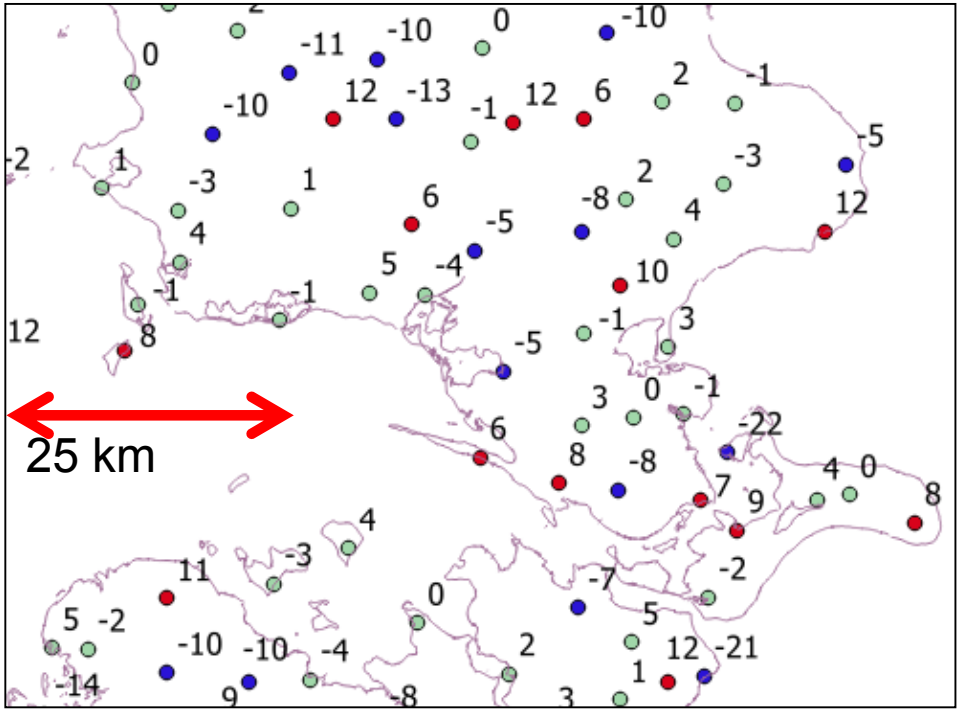
Re-evaluate existing gravity, GNSS and levelling data ->

- Possible re-measurement of selected fix points; GNSS, levelling and gravity
- Possible additional gravity measurements in coastal areas

Differences in mm.

Gravity geoid heights
and
'observed' geoid heights
(Levelling – GNSS).

Some large fluctuations…



New transformation software

- PROJ.4 will replace the in house developed transformation software
- Too demanding to maintain KMSTrans2 and TrLib
- Part of a larger modernization process of the in house geodetic software packages
- Better support to GIS users
- 4D coordinates – temporo-spatial coordinate transformation

New adjustment software

- GNU Gama will replace the in house developed adjustment software
- Implementation of GNU Gama is synchronized with a complete reorganization of the database
- New functionalities will be added (e.g. extrapolation of heights to a given epoch)
- Full implementation of GNU Gama is not expected before 2018

New setup for motorized trigonometric levelling (MTL) with robot instruments

- Total station with 0,5” angular accuracy
- Old MGL surveying team: 4 persons, 1 instrument, 2 surveying cars and 1 car for instrument
- New MTL surveying team: 2 persons, 2 instruments and 2 cars
- In production for height measurements in municipalities since November 2016:

  Old MGL: 2 km per hour

  New MTL: 2-3 km per hour

Subsidence monitoring using Sentinel 1(PSI and InSAR)

Climate change adaptation

Maintenance of sewerage