



Danish Ministry of the Environment  
Danish Geodata Agency

# National Report

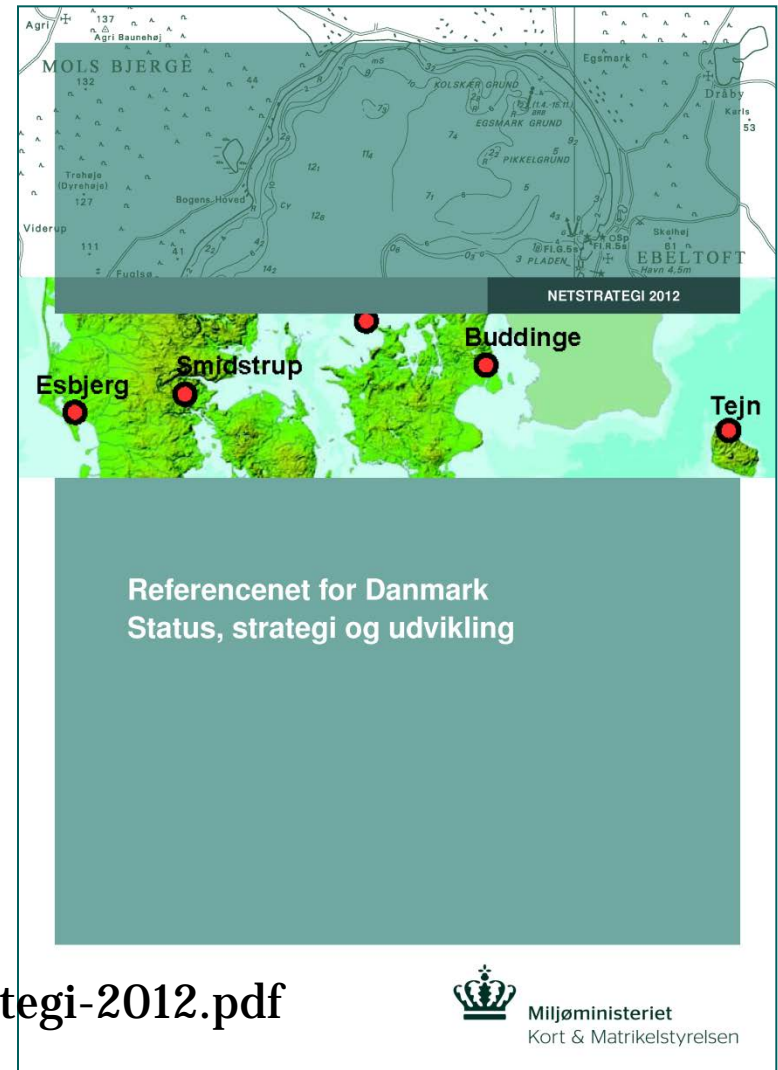
# Danish Geodata Agency Denmark (formerly KMS)

By: Casper Jepsen, Mette Weber, Kristian Keller, Kurt Madsen and  
Thomas Knudsen.



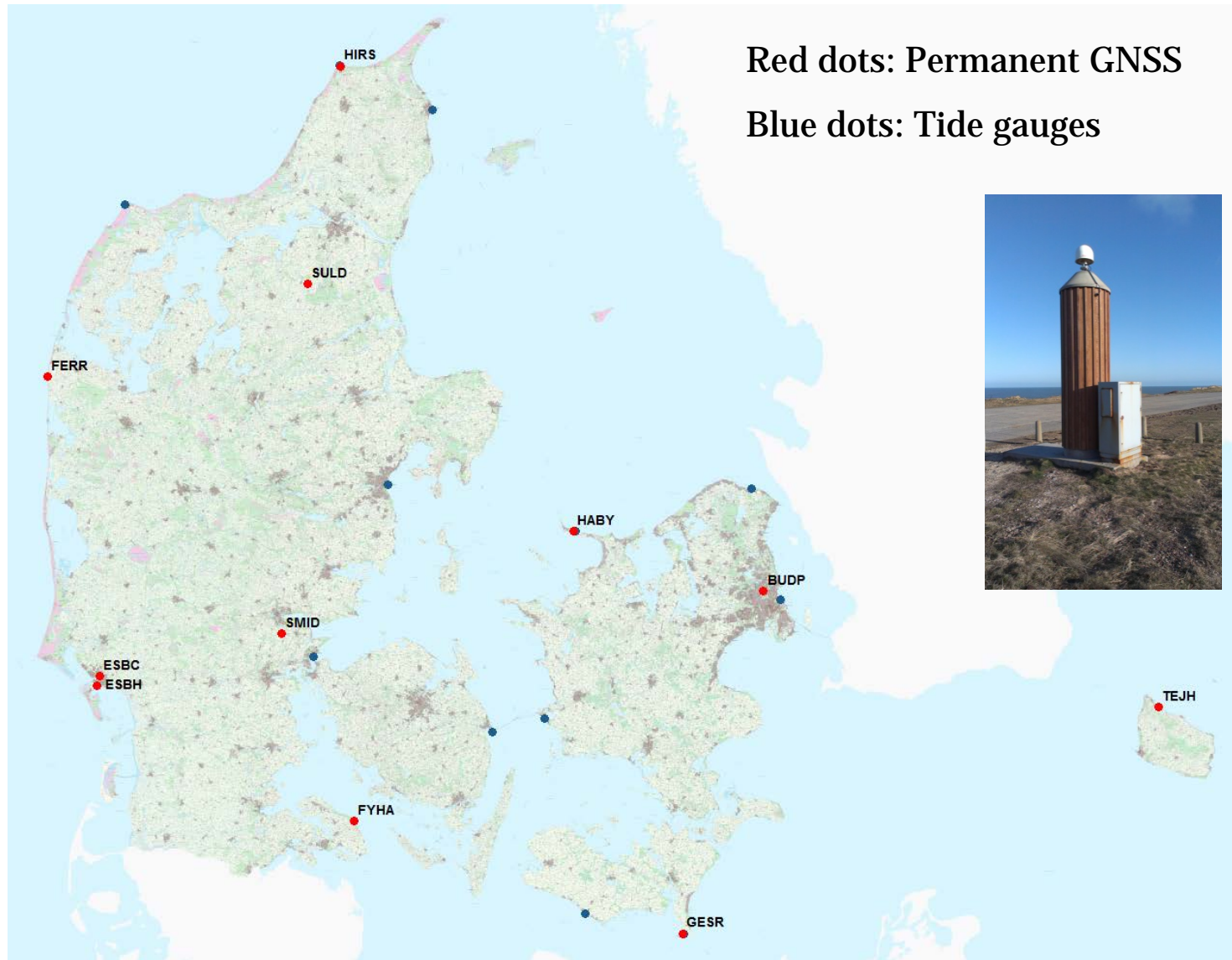
# Strategy for reference networks 2012

- Permanent GNSS stations
- Tide gauges
- GPS reference networks (REFDK and 10 km net)
- Levelling networks
- Gravity network
- Future reference network – "5D network": will define both the future 3D reference system and height system

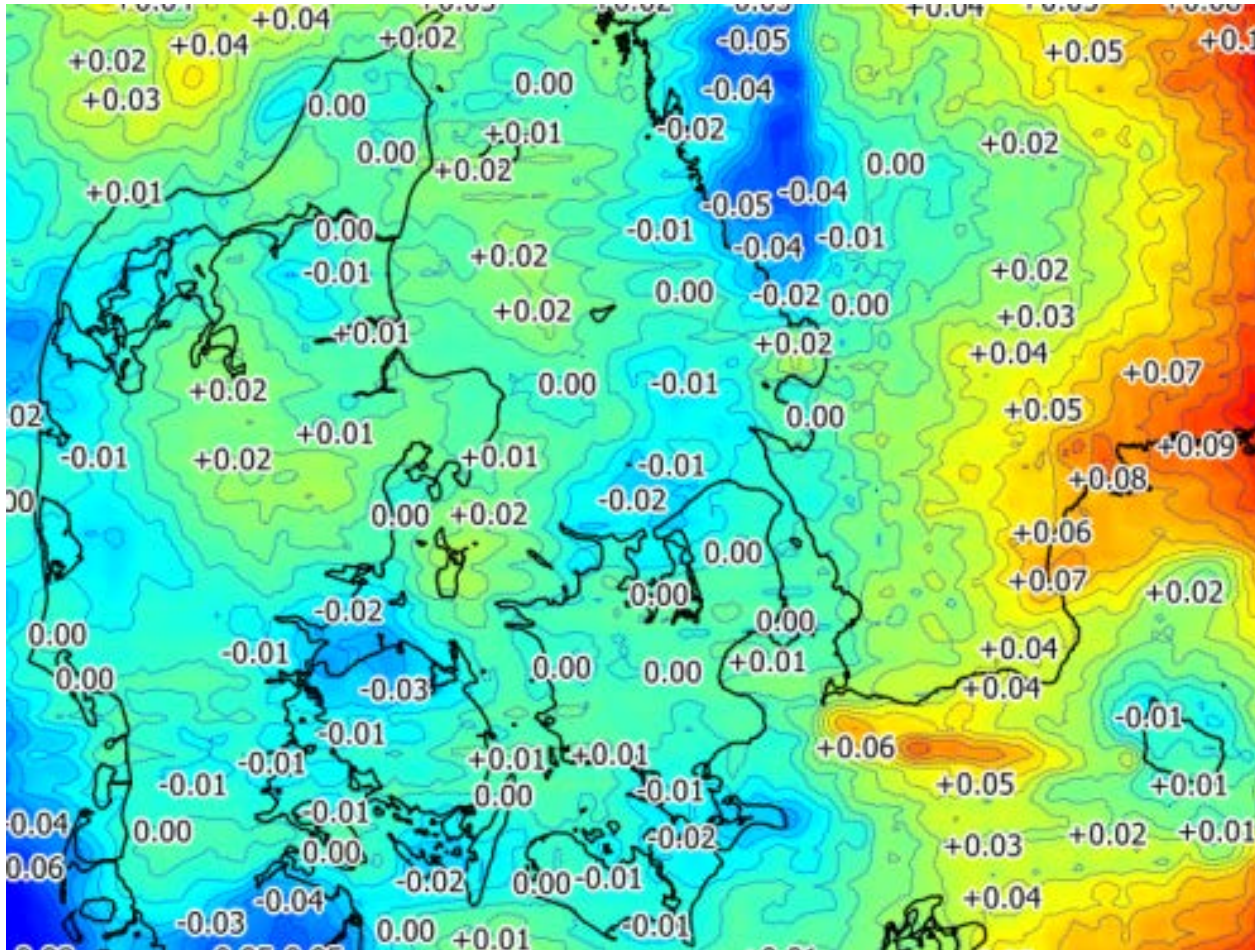


<http://gst.dk/media/gst/65227/KMS-netstrategi-2012.pdf>

# Permanent GNSS stations and tide gauges



# New sub-cm geoid model for Denmark 2013

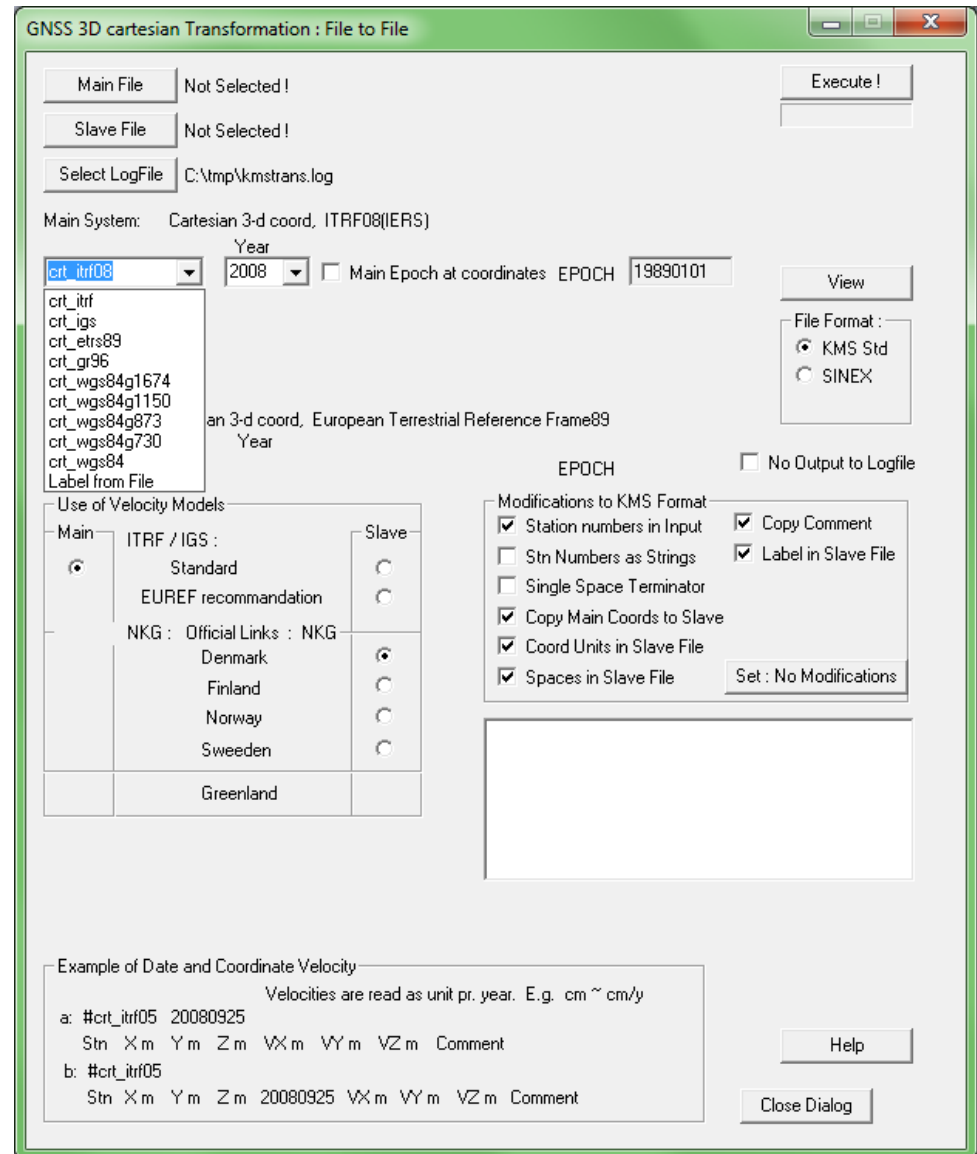


Differences in m between new and old model; new minus old



# KMSTrans & GNSSTrans

- Transformation between international reference frames at various epochs and ETRS89
- Including national transformations for DK, Finland, Norway and Sweden
- Including transformations recommended by EUREF
- Combined 7-param transformation as output
- Public version "soon"

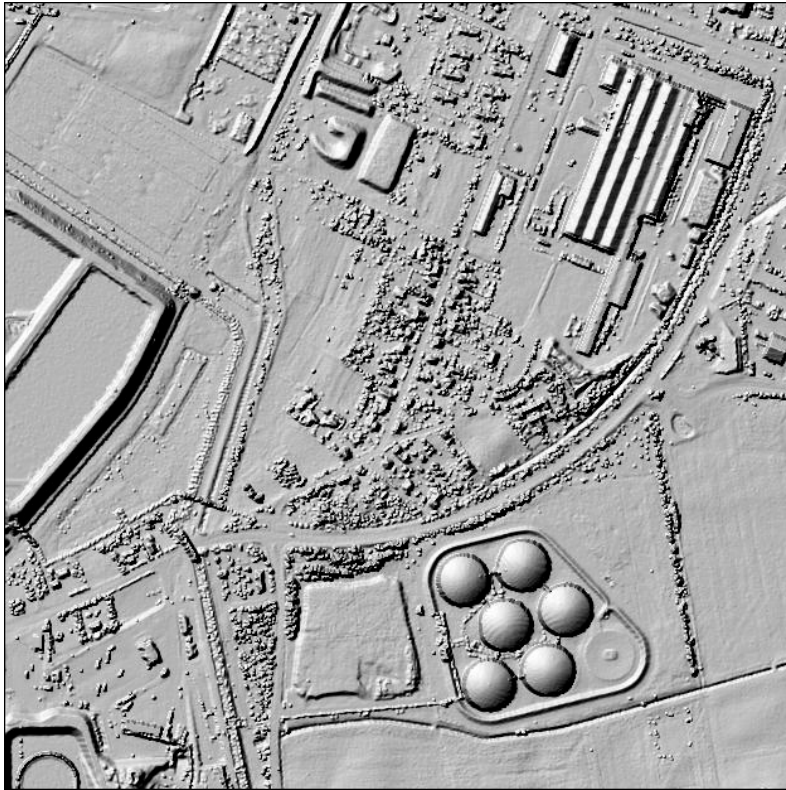


# Motorized Geometric Levelling

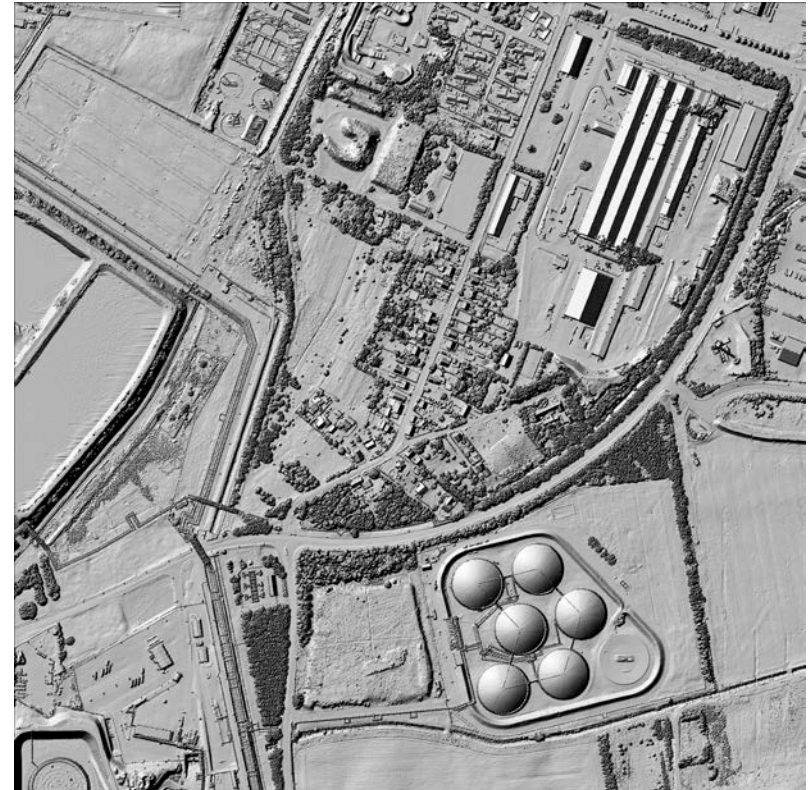
	2010	2011	2012	2013	2014
MGL	880 km	687 km	1209 km	1754 km	343 km
MTL	1427 km	931 km	31 km	1 km	0 km



# New Danish Height Model



DSM – 2007 (0.5 point/sqm)

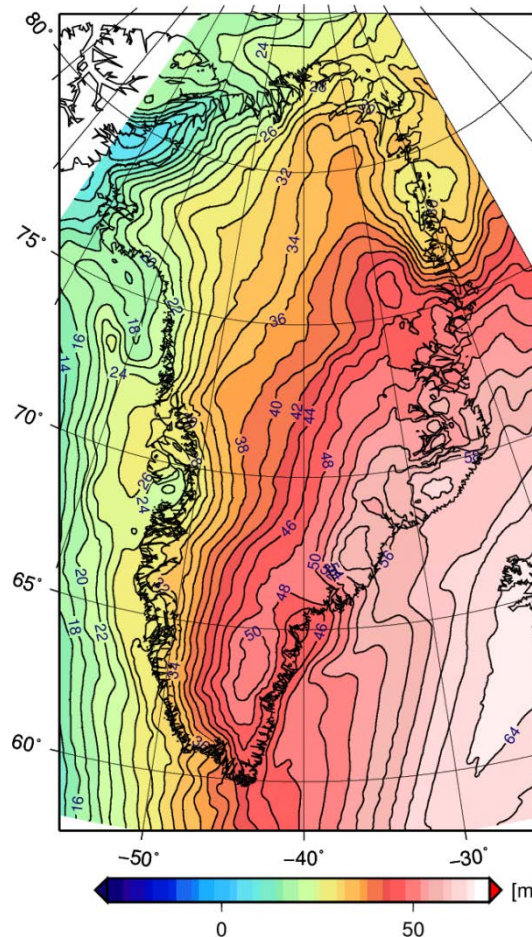


DSM 2014 (4 point/sqm)



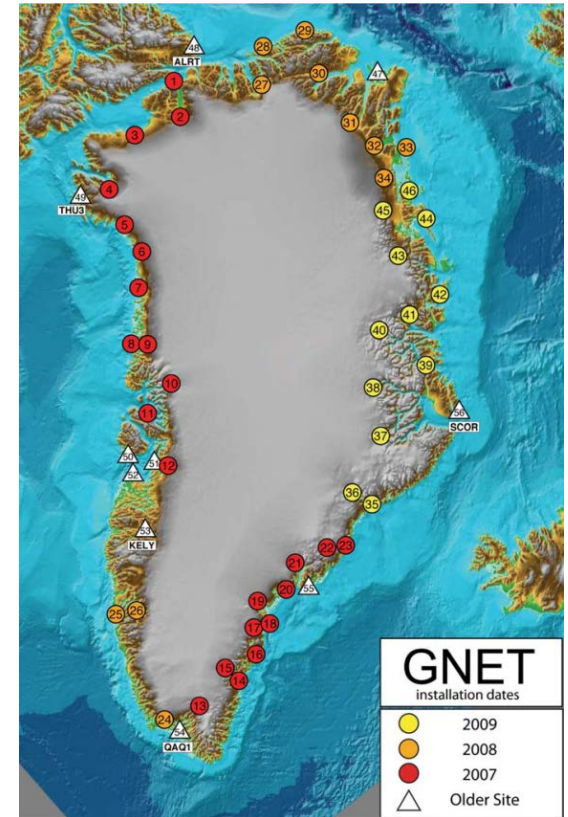
# The reference in Greenland

- DTU Space and GST are preparing a strategy for the reference in Greenland
  - new geoid model
  - new height system
  - uplift model
  - transformations



The geoid height surface in Greenland (GGEOID14)

From René Forsberg, DTU Space



Permanent and semi-permanent GNSS stations for studies of crustal deformations