



Kartverket

Inputs to TWCWG2



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Norwegian Mapping Authority

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6.4: Long term data sets for study of global sea level rise

- Document with results to date has been provided
- Some on-going work and studies
- Project for visualization of future sea level rise

6.8: Determining ellipsoidal height of MSL

- Reminder of on-going project presented last year
- Some challenges and open questions so far

8.1: Update on IOC/GLOSS programme

- Highlights from EuroGOOS TG TT International workshop on sea-level measurements, see also the uploaded minutes.

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Sea Level Change for Norway

Past and Present Observations and Projections to 2100



Einar Egeland

Matthew J. R. Simpson, J. Even Ø. Nilsen, Oda R. Ravndal, Kristian Breili, Hilde Sande, Halfdan P. Kierulf, Holger Steffen, Eystein Jansen, Mark Carson, Olav Vestøl.

- Observed sea level from tide gauge data and altimetry
- New extreme value analysis done on long term data sets

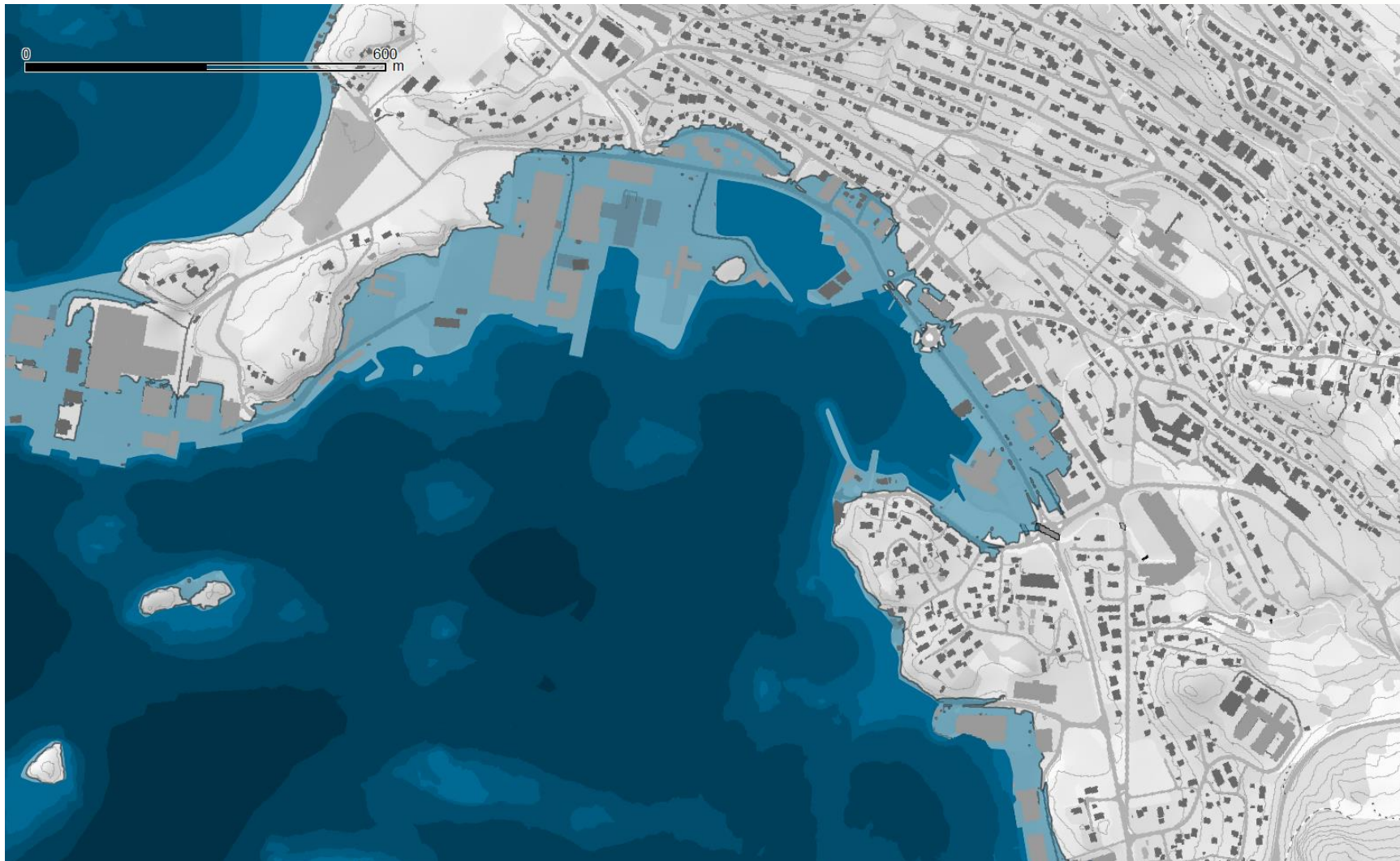
Related to study of long term data sets

- The effect of decadal variability on the high sea level events on the Norwegian coast
 - Collaboration with FMI and NERSC
- Comparison of methods in the Scandinavian countries and Germany
 - Methods for extreme value analysis
 - How adaptations for climate changes are done
 - Collaboration through NERSC with different institutions
- **Visualization of Sea Level**
 - Planning and visualization tool which couples the future sea level rise, the tidal levels and the extreme water levels with detailed terrain models

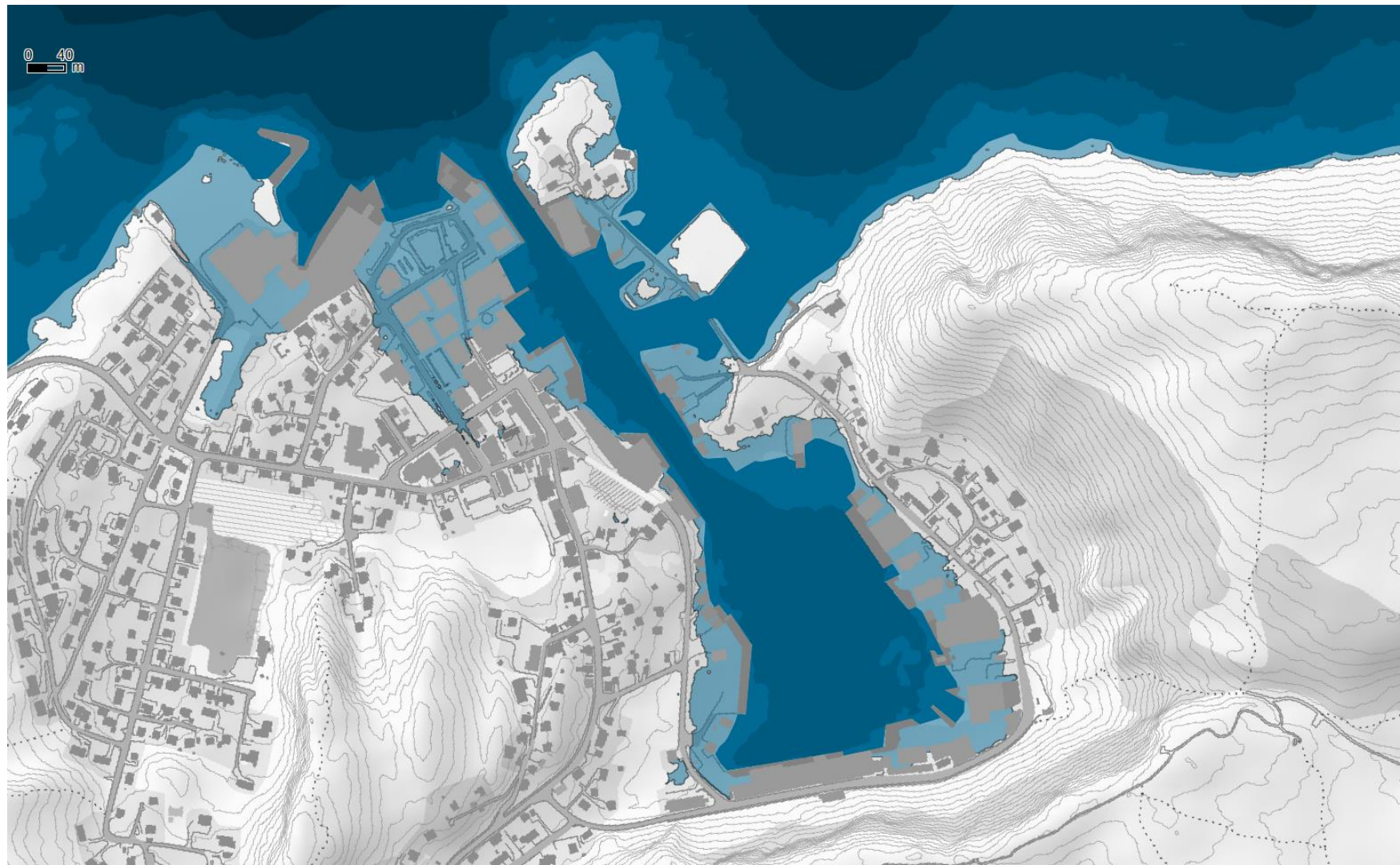
Oslo



Ulstein



Herøy



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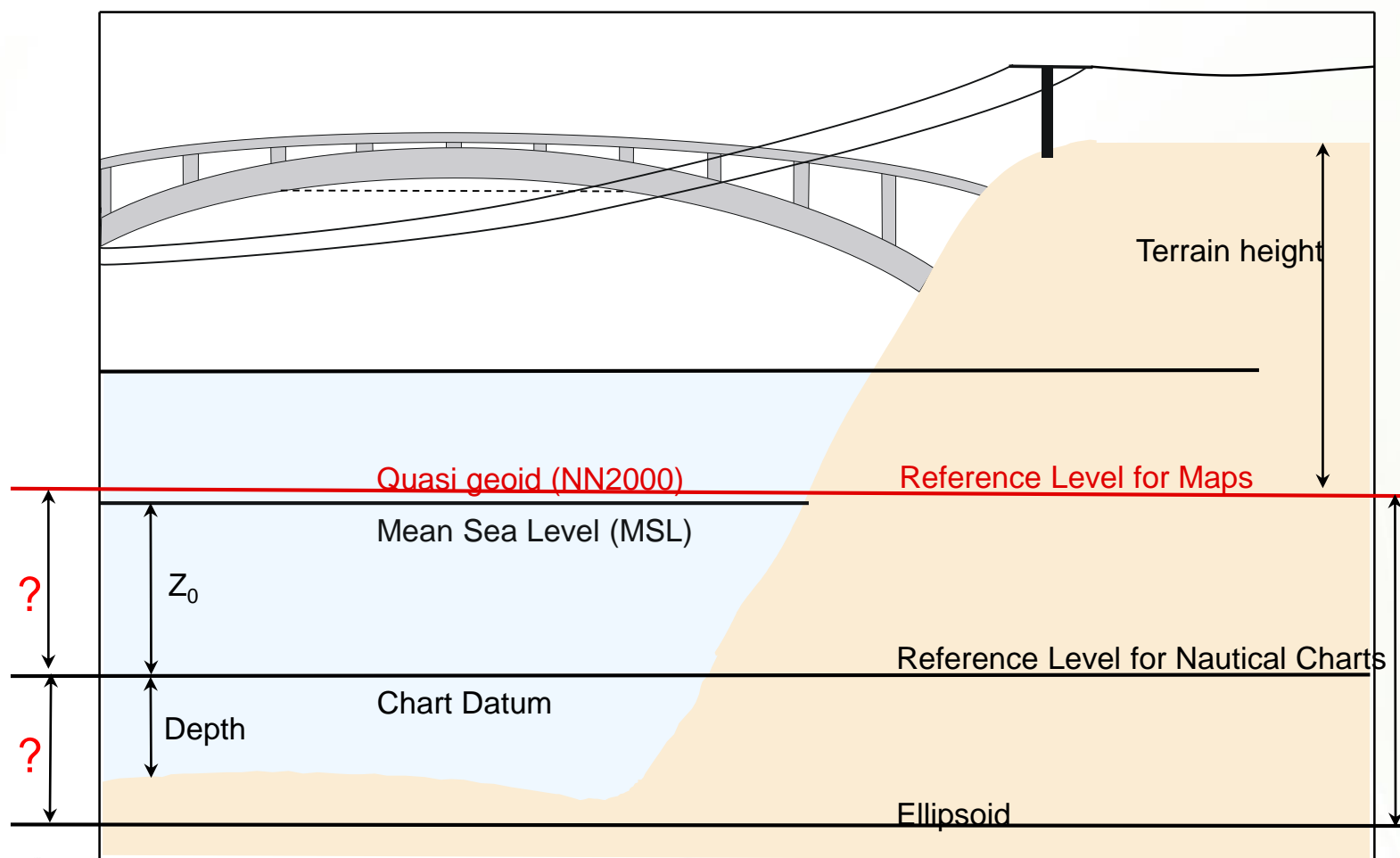
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A common reference frame in the Søre Sunnmøre area



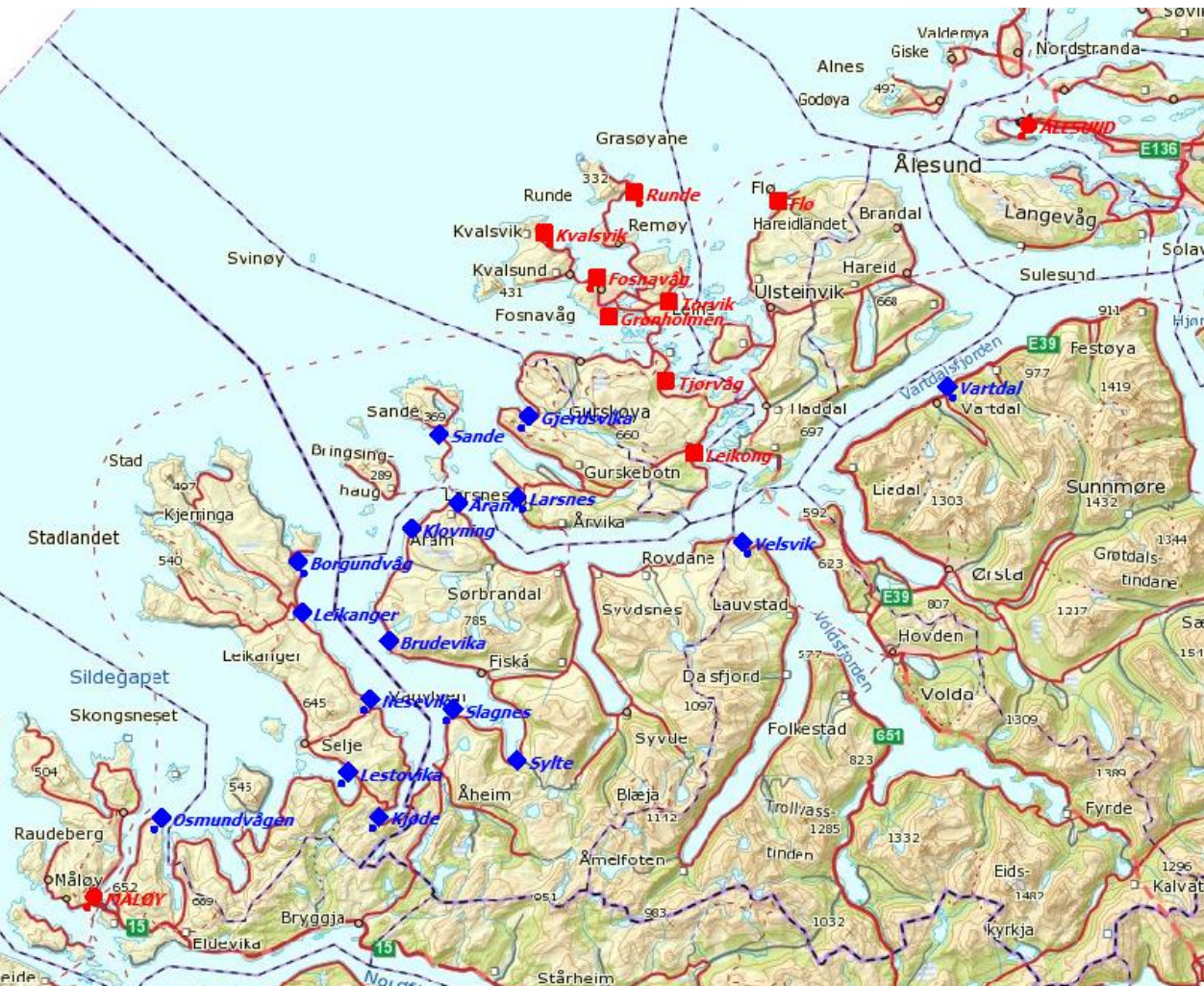
Ok

A common reference frame in the Søre Sunnmøre area



- Connecting the official national height reference system and Chart Datum:
 - Improve the geoid model
 - Establish a mean sea level model rel. ellipsoid
- Develop a method that can be used along the entire Norwegian coast.
- Project deadline: end of 2017

Current status: «The more you measure, the less you know»



- Methods, definitions, theory vs practical realisations...
- Quality of measurements
- When are «unexpected» results physical features and not problem with the sensors?

Open questions and challenges

Other than choice of methods and recommendations:

- Requirements and standards for water level measurements
 - What accuracy?
 - Different end-users, different requirements?
- Use of pressure sensors
 - Water density
 - Reliability

What experiences do you have?
- Measurements in remote places: what do others do?

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EuroGOOS Tide Gauge Task Team

International Workshop on Sea-Level Measurement Technologies

- Technology: from traditional to new experiments and tests
- «Non-traditional» purposes
 - Tsunami warning: Measuring and processing high frequency sea level oscillations (also *meteotsunamis*, *infragravity*)
 - Tide gauge data for altimetry validation and interpretation
- More focus on redundancy: measurement and communication
- Standards and formats, metadata including data processing