



Kartverket

National report from the Norwegian Hydrographic Service

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TWCWG1, Niterói, April 2016*

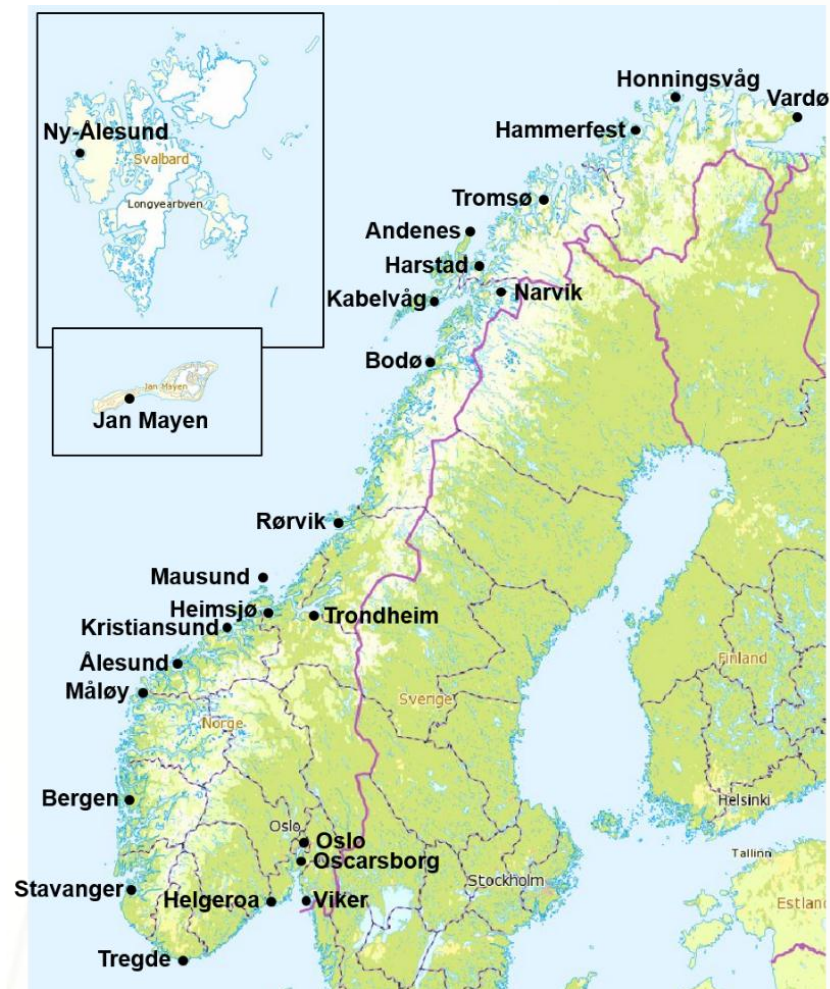


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Norwegian Mapping Authority

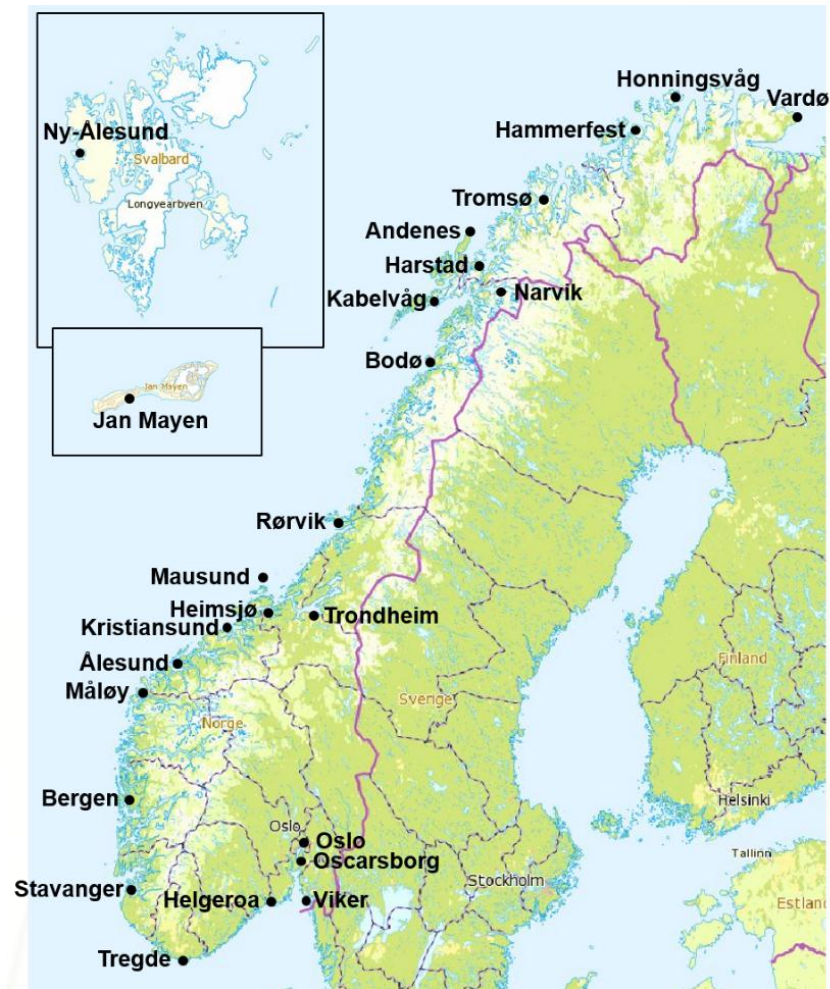
Update on activities

- Permanent tide gauges
- A common reference frame
- Report on sea level change



Update on activities

- Permanent tide gauges
 - 23 along the coast
 - Ny-Ålesund, Svalbard
 - Jan Mayen (since 2014)

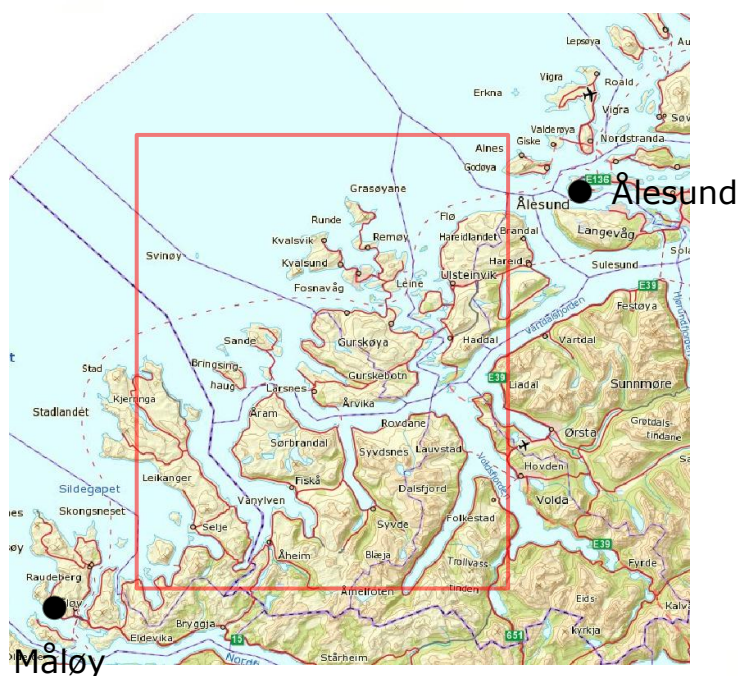


A common reference frame in the Søre Sunnmøre area



- Determine the relationship between the official height reference system used in maps and the Chart Datum used in the official nautical charts
- Develop a method that can be used along the entire Norwegian coast
- Project ongoing until 2017

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A common reference frame in the Søre Sunnmøre area

- Two additional projects in the same region
- Green Laser Søre Sunnmøre (GLaSS)
 - Close the gap between the existing data in the maps and the navigational charts
- 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

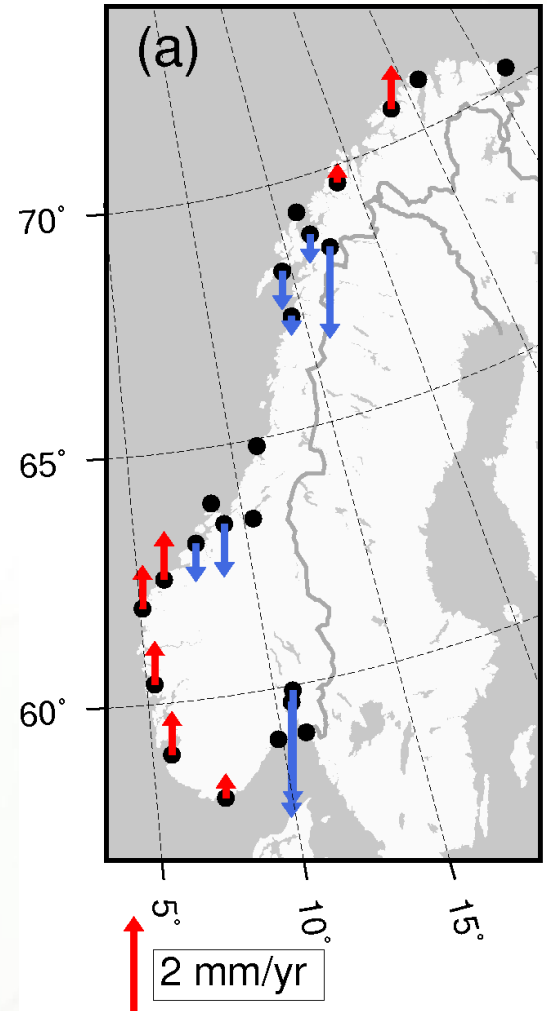
Report on sea level change

- The report «Sea Level Change for Norway, Past and Present Observations and Projections to 2100», by Simpson et. al. was published in September 2015
- Main contributions from The Norwegian Mapping Authority, Geodetic Institute and Hydrographic Service, and Bjerknes Center for Climate Research
- Report ordered by the Norwegian Environment Agency – will serve as the basis for recommendations given to local authorities

Report on sea level change

Observed sea level change:

- From the permanent tide gauges and satellite altimetry
- Relative sea level rates at the Norwegian tide gauge network reflect the pattern of land uplift
- After correcting for land uplift, the coastal average rate of change is 1.9 mm/yr for 1960–2010 and 3.6 mm/yr for 1993–2014.
- Altimetry based rates concur with corrected tide gauge rates (1993–2014).

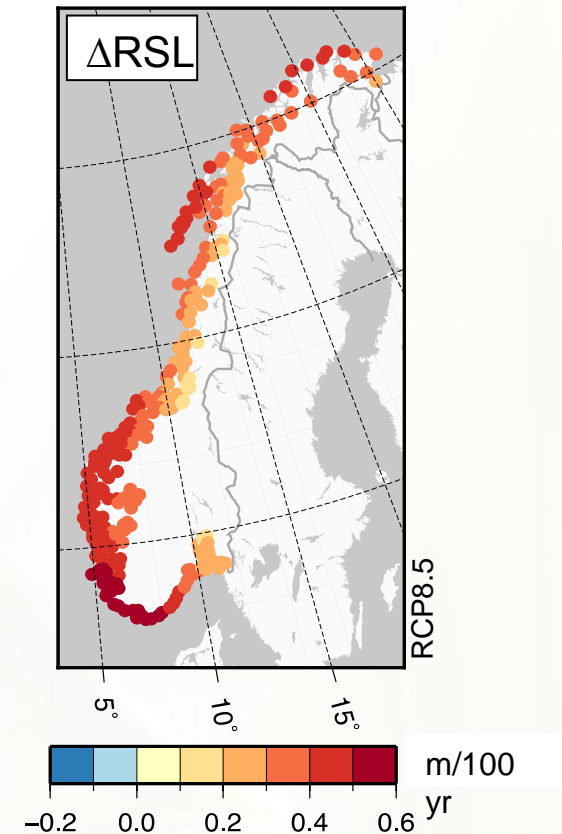


Relative sea level rise 1960–2010

Report on sea level change

Projected sea level change:

- Regional sea level projections based on the Fifth Assessment Report (AR5) from IPCC adjusted for local effects (e.g. land uplift)
- 3 different scenarios are considered – low emission, reduced emission and high emission (business as usual)



Report on sea level change

- Updated return heights for extreme sea levels
- Results are distributed online: www.kartverket.no/en/sehavniva
 - Water level observations and tides and water level forecasts
 - Reference levels and return heights
 - Land uplift

Thank you for your attention

Observed and predicted tides, water level and future sea level rise

www.kartverket.no/en/sehavniva

Simpson, M. J. R., J. E. Ø. Nilsen, O. R. Ravndal, K. Breili, H. Sande, H. P. Kierulf, H. Steffen, E. Jansen, M. Carson and O. Vestøl (2015). Sea Level Change for Norway: Past and Present Observations and Projections to 2100. Norwegian Centre for Climate Services report 1/2015, ISSN 2387-3027, Oslo, Norway

<http://www.miljodirektoratet.no/no/Publikasjoner/2015/September-2015/Havnivaendring-i-Norge/>