National report of Norway

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The Norwegian Mapping Authority - The Geodetic Institute

- Responsible for national geodetic information on which all positioning, measuring, mapping and earth observation is based
- Measures and establishes a national reference frame for coordinates, geoid reference, height reference and post-glacial rebound
- Operates a nationwide system of accurate, satellite-based GNSS positioning
- Helps to provide a uniform global reference frame by way of initiatives such as the geodetic observatory at Ny-Ålesund on Svalbard
Continuous Operating Reference Stations - CORS

• Mainland Norway: 198 Trimble NetR9 receivers
  • Inter-station distance between 35-70 km
  • GPS, GLONASS, Galileo and Beidou

• 6 Trimble NetR8/9 receivers on the Svalbard archipelago and Jan Mayen

• 11 (9) Septentrio PolaRxS scintillation receivers

• 8 Topcon Net-G5 receivers for monitoring
Correction services

• Network RTK service
  • RTCM 3.1 with GPS and GLONASS
  • Ongoing process of updating the service to RTCM 3.2 MSM with GPS+GLO+GAL+BDS
  • 4000 paying subscribers and up to 850 simultaneous users
  • Continuous growth in the customer base
  • Streaming of data to private service provider with 1200 subscribers

• DGNSS service

• ETPOS service – RINEX 2.11 (and 3.02)
Ionospheric monitoring

- Around 300 stations equipped with geodetic receivers
- Cooperating agencies: Lantmäteriet, Danish Geodata Agency, Danish Technical University, Finnish Geodetic Institute and Geotrim OY, Umhørvísstovan
- 11 scintillation receivers
- sesolstorm.kartverket.no
National achievements 2016-2018

• Nationwide coverage of the new height system NN2000
• Pre-study of the establishment of a common vertical reference frame for sea and land applications – To simplify future sea floor and water column mapping
• Pre-study of densification of CORS along railway segments – currently in negotiation with the Norwegian National Rail Administration regarding a larger densification project
• Pilot project for Dynamic Reference Frame (DRF) on Iceland
• Contracts with The Norwegian Space Centre (NSC) and GSA on the monitoring of EGNOS and Galileo performance
• Strong contributer in the United Nations Global Geospatial Information Management (UN-GGIM) Subcommittee on Geodesy
• Membership in ITS Norway
Goals for geodetic activities in Norway towards 2025

• To make and maintain a global geodetic reference frame for Norway that makes it possible to combine the use of geospatial data and positioning services without having geodetic knowledge.

• Contribute to make Norway a leading country innovating safe use of GNSS.
Future outlook and open questions

• Increasing interest in real-time data from national CORS infrastructure from global, regional and national service providers. How does the future look for NRTK services operated by the NMCAs?

• Legal regulations regarding the use of positioning services (NRTK, PPP/PPP-RTK) for cadastral surveying?

• What role will the NMCAs play in the future of ITS, autonomy and high accuracy positioning in the consumer market?
  • Cooperation across borders?
  • National and global reference frames?
  • NRTK, PPP or PPP-RTK? National, regional, global services?