

The National Report of Iceland for the NKG working groups "Satellite Geodesy"
and "Geodynamics"

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The National Land Survey of Iceland (LMI) has just recently started to become larger involved in geodetic programs. The National Energy Authority (Orkustofnun), the Public Road Administration (Vegagerðin) and the National Power Company (Landsvirkjun) have carried out many of the geodetic activities. Only since 1999 LMI owns GPS receivers and can carry out its own surveys.

Satellite Geodesy:

LMI operates in cooperation with the Bundesamt für Geodäsie und Kartographie (BKG) two GPS permanent sites. One is located in Reykjavik consisting of a ROGUE SNR-8000 (upgraded to ACT) and a GPS/GLONASS receiver from ASHTECH (Z-18). The other site is in the geodetic observatory of LMI that is located in HÖFN (TRIMBLE 4000 SSi). At the same site (Höfn) Statens Kartverk operates a ROGUE Benchmark receiver and ESA an EGNOS RIMS (Ranging and Integrity Monitoring Stations).

The Institut Geographique National (IGN) operates in Reykjavik a DORIS Beacon. LMI maintains the station, but the beacon seems to work very reliable. It is also worth to mention that in the geodetic observatory in Höfn Statens Kartverk installed a PRARE station.

LMI uses the software GIPSY/OASIS II for the processing of GPS data from permanent sites in Iceland and around the North Atlantic. Due to a cooperation with the Icelandic Meteorological Office (Veðurstofa Íslands) data from the ISGPS network (<http://www.vedur.is/ja/skyrslur/isgps/isgps.html>) is processed together with the data from the other permanent GPS sites. The processing still does not run automatically but that is scheduled for the future.

LMI has so far not installed permanent GPS sites itself. Nevertheless there is a plan to do so in the next years. A proposal is still in preparation and will be handed in to the ministry in the beginning of next year. The aim is to install about 9 stations to monitor the Icelandic reference network (ISNET93) and to use it as the new reference system.

Geodynamics:

The link between satellite geodesy and geodynamics is very close in Iceland. At all times the crustal deformations can be observed. Plate tectonics, earthquakes or volcanic eruptions can cause them. Therefore the results from the processing of GPS data can be used to study geodynamics in Iceland. With the probable installation of a permanent GPS network by LMI and the cooperation with scientific agencies like the Icelandic Meteorological Office crustal deformation can be monitored continuously.

In 1997 the BKG carried out absolute gravity measurements with an FG5-101 on seven sites in Iceland: Höfn, Egilstaðir, Akureyri, Holmavík, Reykjavík, Haumyrar and Herðubreiðarlindir. The last two stations are located in the interior of Iceland. The results from this survey will establish the first order gravity network in Iceland. The accuracy of these results is in the region of 2-3 μGal . The Finish Geodetic Institute using a JILAG-5 has also occupied the stations in Reykjavík and Höfn. The results of these two campaigns (BKG and FGI) are still not published.

Absolute gravity surveys have also been carried out by the Institut für Erdmessung of the University of Hannover (Germany). There have been 7 stations in North Iceland in 1987: Akureyri, Garður, Húsavík, Krafla, Laugar, Reykjavík and Skútustaðir. These stations are with exception of Reykjavík located along a leveling line from Akureyri to Vopnafjörður.

A number of other research groups from many different countries carry out observations in the field of Geodynamics. It is difficult to give a complete picture on the ongoing activities. To name a few groups:

- The Nordic Volcanological Institute (Reykjavík)
- The Science Institute, University of Reykjavík
- The Icelandic Meteorological Office
- Bundesamt für Kartographie und Geodäsie (Germany)
- Institut für Erdmessung, Universität Hannover (Germany)
- Department of Geological Sciences, University of Durham (UK)
- Institut für Photogrammetrie und Geodäsie, Universität Braunschweig (Germany)
- Laboratoire De Géodynamique Des Chains Alpines (LGCA), Université de Savoie (France)
- Department of Geodesy and Photogrammetry, Royal Institute of Technology (Stockholm, Sweden)