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Relation between seismicity and tectonic structures offshore and onshore Nordland, northern Norway

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The largest earthquake in northwestern Europe over the past 200 years took place in Rana, Nordland, Norway, and the region still exhibits persistent earthquake activity. A temporary network of 27 stations was deployed from 2013 to 2016 along the Nordland coast of northern Norway. The NEONOR2 project was aimed to improve the understanding of neotectonic movements, stress regime and overall seismicity pattern in Nordland and the adjacent offshore areas. The recorded seismic events were located using data from both, the temporary NEONOR2 deployment and the permanent stations of the Norwegian National Seismological Network (NNSN) as well as other relevant stations from the neighboring seismological networks.
A more detailed understanding of the seismicity has been obtained and efforts to relate the earthquakes with the tectonic structures, and, finally, hypothesize the cause of the earthquakes have been made. The most seismically active area in Nordland during the NEONOR2 project was to the west of Svartisen, including a clear swarm-like activity. The shallow microseismicity in this very active area may be related to changes in the glacier (melting/freezing/accumulation) and possibly to groundwater conditions. It has regrettably not been possible to obtain detailed data on temperature and precipitation that could be used to investigate the possible correlation between such data and earthquake activity.
The observed seismicity provided clear indications of activity along several previously unknown structures. During the observation period no earthquakes were located along the Bivrost transfer zone, in the Trænabanken area and in the larger Vestfjorden area. We must consequently presume that the Bivrost transfer zone is tectonically quiet, and that the large offshore regions of Trænabanken and Vestfjorden are very stable. This largely confirms earlier assumptions, but this time with much improved data.
The data obtained provide strong indications that the Svartisen glacier has a decisive influence on the shallow seismicity observed in the periphery.