

Project DAFNE: Deep drilling in the Pärvie postglacial fault system

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We are currently developing an ICDP project 'Drilling Active Faults in Northern Europe' (DAFNE) which aims at investigating, via scientific drilling, the tectonic and structural characteristics of the Pärvie postglacial fault system (PFS) in northern Sweden, including the hydrogeology and associated deep biosphere in the fault system.

During the last stages of the Weichselian glaciation (ca. 9,000 - 15,000 years B.P.) reduced ice load and a glacially affected stress field resulted in active faulting in Fennoscandia with fault scarps up to 160 km long and 30 m high. These post-glacial (PG) faults are usually SE dipping, SW-NE oriented thrusts, and represent reactivated, pre-existing crustal discontinuities. Postglacial faulting indicates that the glacio-isostatic compensation is not only a gradual viscoelastic phenomenon, but includes also unexpected violent earthquakes, suggestively larger than other known earthquakes in stable continental regions.

We aim at drilling three deep holes in two phases in the Pärvie fault system which is the longest of the known PG faults. The first drilling phase comprises two 1 km deep core holes, and second phase one 2.5 – 5 km deep hole targeted to reach the seismogenic zone.