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The Swedish Deep Drilling Program – projects and status 2012

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Five years ago, the Swedish Deep Drilling Program (SDDP, www.sddp.se) was launched by a group of scientists with a common interest in scientific drilling to foster innovative projects and support them during their life cycle. This initiative was successful from the very beginning:

- Sweden became a member of the International Continental Scientific Drilling Program (ICDP) in 2008
- Two ICDP supported workshops were held by the COSC and DAFNE projects (see below) in 2010
- In 2011, ICDP conditionally approved the full proposal of the COSC project. An addendum was submitted in late 2011.
- A third project, CISP, submitted a workshop proposal this year.
- A modular truck-mounted Atlas Copco CT20 core drill-rig, funded by the Swedish Research Council, is presently commissioned as a national research infrastructure at Lund University.

Selected SDDP projects:

COSC: Collisional Orogeny in the Scandinavian Caledonides
Focuses on the transport and emplacement of subduction-related high-grade COT complexes onto the Baltoscandian platform and their influence on the underlying allochthons and basement. Two drill holes, each to c. 2.5 km depth, will together sample the high-grade nappes through underlying allochthons and penetrate a kilometre into the underlying basement. The multidisciplinary research will be tightly integrated with studies of other mountain belts, both active and fossil. The project has ICDP support and site-selection for the first hole is completed. Drilling will start as soon as missing funds (c. 500000 €) are secured.

DAFNE: Drilling Active Faults in Northern Europe
Faults were active at the end of the last ice age at about 9,000-10,000 years BP due to changes in the bedrock stress field. Very strong earthquakes occurred under, or just outside of the withdrawing ice sheet. Today, the partly still active structures are sharp fault lines with lengths of 10-150 km and vertical displacements of 1-30 m. Post-glacial faults of this magnitude are rare and extremely interesting from a scientific point of view. However, the research has also great relevance to society for predicting the behaviour of rock during future glaciations. A full proposal to ICDP will be submitted in 2014 with the aim to drill three core-holes (shallow and deep) through post-glacial faults in 2015 and 2016. See also Session “TS8.3 Intraplate faulting in deglaciated areas” here at EGU!

CISP: Concentric Impact Structures in the Paleozoic
CISP aims to characterize the Lockne and Siljan craters. The Siljan structure, the largest impact structure in Western Europe, and Lockne, which is the best accessible and studied impact, formed in a relatively deep sea close to the presumed Himalayan-type Caledonian mountain front in Sweden. Their evolution after impact is the result of the interaction between a gigantic overthrust plate and Baltica through about 80 Ma. The most important interaction was the likely depression of Baltica’s west flank to form the trough where both craters are located. In addition to impact tectonics, the effect on life by the impact event can be studied in the Lockne area where records of post-impact re-colonization are found. An ICDP workshop proposal was submitted in 2012.