



## > Exploring the Scandinavian Mountain Belt by Deep Drilling (COSC)

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The Collisional Orogeny in the Scandinavian Caledonides (COSC) project proposes to drill two fully cored scientific boreholes, both to c. 2.5 km depth, in the Swedish Caledonides, one near the town of Åre (COSC 1) and the other further east (COSC 2). Together they will provide a c. 5 km deep high-resolution mid-crustal section through this major mid-Palaeozoic orogen. Main project objectives include (i) improved understanding of mountain building processes (orogeny), (ii) investigation of the geothermal gradient and its response to palaeoclimatic influences, (iii) the hydrogeological-hydrochemical state of the mountain belt, (iv) the deep biosphere in the metamorphic rocks and crystalline basement, and (v) calibration of surface geophysics and geology.

The Caledonide Orogen is comparable in size and many other respects to today's Himalayan mountain belt. Silurian collision with underthrusting of the paleo-continent Baltica below Laurentia resulted in widespread formation of eclogite. Major allochthons were transported many hundreds of kilometers onto the Baltoscandian Platform, including high-grade metamorphic rocks and migmatites which were generated during continental margin subduction and emplaced ductilely at mid-crustal levels.

COSC will provide detailed insight into mid-Palaeozoic mountain building processes and further our understanding of past, present and future orogen dynamics. Located in a key-area for Caledonian geology, it is close to a major geophysical transect across the mountain belt which has been complemented recently with high-resolution reflection seismics and aerogeophysics for site-selection. The COSC research program is being developed by five working groups, geology, geophysics, geothermics, hydrogeology and microbiology. It has direct relevance for society by improving our understanding of mountain building processes, hydrological-hydrochemical regimes in mountain areas and Precambrian shields, deep subsurface conditions for underground engineering, ore genesis and assessment of geothermal potential. After a general scientific workshop supported by ICDP in 2010, the hydrogeological aspects of deep drilling were the topic of a separate workshop last year; orogen dynamics will provide a focus at EGU; and geothermics research will be addressed at a workshop in Autumn 2012. The geothermics workshop will be announced on the ICDP homepage.

Partial funding for the drilling has been achieved through national sources and ICDP. Additional funding (c. 500000€) is being sought to allow drilling to commence in 2013. Scientific and financial partners, both from academia and industry, are welcome to the project. The presentation will review the current status of the COSC project and the research leading up to the site selection for COSC 1.