



ICDP drilling in the Scandinavian Caledonides: Plans for COSC-2

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Previous drilling in the Caledonian front, along with seismic reflection and magnetotelluric profiling, has shown that the sole thrust of the orogen, defined by the base of the Jämtlandian fold-and-thrust belt, dips gently westwards (1-2 degrees), with organic-rich black alum shales in the footwall underlain by a basal Cambrian unconformity and Paleoproterozoic granites and gneisses (perhaps also Mesoproterozoic sandstones). These basement rocks are remarkable for their pattern of prominent seismic reflections, some of which are almost certainly related to hypabyssal mafic intrusions, as exposed in the autochthon to the east of the Caledonian thrust front. Others may be thrust zones, or a combination of both, with the mafic sheets variously rotated and sheared. A key component of COSC-2 is to penetrate these reflectors and determine their origin and age (either Caledonian or Precambrian, or both), perhaps defining the Sveconorwegian deformation front beneath these central parts of the Scandes. COSC-2 will start in the lower thrust sheets, pass through the basal décollement and investigate the character of the deformation in the underlying basement. Combined seismic and magnetotelluric (MT) data provide control on the basement structure and the depth to the basal décollement, which is believed to host the highly conductive Alum Shale. New seismic data acquired in 2014 combined with previous data help define the depth where distinct basement reflectors can be penetrated. Drilling into the basement and understanding of the deformation pattern and the age of deformation are keys to unraveling the collisional process. COSC-2 will also be fully cored and the drilling program, as well as the on-site science, will build on the experience from drilling of COSC-1. Applications for drilling related costs will be made to ICDP and the Swedish Research Council and, if funded, drilling will be carried out in 2017. Researchers interested in any aspect of the COSC project are invited to join and participate in on-site science, core studies and downhole geophysics, on their own funding.