



Coring and High-Resolution Imaging of the Permian-Triassic Boundary in Deltadalen, Svalbard

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The Permian-Triassic extinction was likely triggered by the voluminous igneous activity of the Siberian Traps. There are, however, limited information available about the effects of the Siberian Traps volcanism in Permian to Triassic sedimentary successions outside Siberia. We drilled two boreholes across the Permian-Triassic boundary (PTB) in Deltadalen, Svalbard, in August 2014, to better document the extinction event and environmental changes in the sedimentary succession in this region. Even though the PTB event is studied in several outcrops to varying degree of scrutiny on Svalbard, a scientific core is important for understanding the details of the PTB event, as outcrops may not permit studies at the appropriate levels of resolution, exposure or confidence. The Deltadalen site was chosen as an optimal drilling location after field work in the Isfjorden area in 2013 and early 2014. The almost 100 m deep holes were fully cored and penetrated the Triassic Vikinghøgda Formation (about 85 m recovered) and the Permian Kapp Starostin Formation (about 15 m). The main lithologies include Permian chert-rich green glauconitic sandstones and Triassic mudstones. A 10 m thick sedimentary reference outcrop section across the PTB was further logged and sampled in a nearby river valley. A comprehensive core analysis program is now underway. High-resolution XRF, MST and hyperspectral core scanning has been completed along the entire core surface, while high-resolution CT scanning has been carried out for whole core sections. The DD-1 core has subsequently been split, photographed, described, and sampled for geochemical, micropaleontological, petrological and magnetic analyses. Almost 10 bentonite layers have furthermore been sampled for volcanological and geochronological studies. Our goal is that the cores will become an important future reference section of the PTB in Svalbard and the high-Arctic, and help constrain the extent of the regional effects of explosive volcanism from the Siberian Traps.