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Pre-site Study for Deep Geological Drilling below Ekström Ice Shelf, Sub-EIS-Obs

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During the last seasons and ongoing, pre-site seismic surveys have taken place in the Ekströmisen region of Dronning Maud Land, with the primary of building a stratigraphic age framework of the under-ice-shelf sediments. These sediments are overlying the Explora Wedge, a syn- or post-rift volcanic deposit. Expected ages range from Late Mesozoic to Quaternary. From new vibroseismic profiles we will select sites for short core seafloor sampling through Hot Water Drill (HWD) holes of the oldest and of the youngest sediment sequences to confine their age time span. There is further potential for drilling deeper sediment cores with the support of international partner. Deep drilling should recover the sediments overlying the Explora Escarpment, in order to discover the nature of the Explora Wedge. We expect the overlying sediment sequences to reveal the history of polar amplification and climate changes in this part of Antarctica, the build-up of the East Antarctic Ice Sheet during past warmer climates, and its Cenozoic and future variability.

Having HWD holes through the shelf ice and sampling the sea floor will provide the unique opportunity for further piggy back experiments consisting of multi-disciplinary nature. Experiments and measuring setup for oceanography, sea and ice shelf physics, geophysics, geology, hydrography, biogeochemistry could be planned to characterize the ocean-ice-sediment interactions, processes and ecosystem observations.