



## **Volcanic signals and surface mass balance from firn core records from the Norwegian-US traverse across the East Antarctic plateau**

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We present an overview of volcanic signals recorded in 20-100 m deep firn cores collected during the Norwegian-US scientific traverse through East Antarctica 2007-09. The traverse covered large parts of Dronning Maud Land, acquiring ground-based data from remote areas of the East Antarctic plateau. The route went from Norwegian Troll Station to South Pole and back on a different route in the following year.

Here we use electrical conductivity from dielectric profiling (DEP) and sulphur records from ICP-MS chemistry measurements along the cores to detect major volcanic events such as Krakatau 1883, Tambora 1815 and Huayanaputina 1600 to date the cores. Thus, mean surface mass balance (SMB) for different time periods between volcanic horizons can be obtained. Ground penetrating radar (GPR) data are utilized to assess the spatial representativity of the core sites.

In general, measured SMB values are very low, varying between 16-34 kgm<sup>-2</sup>a<sup>-1</sup> on the first traverse leg and between 35-68 kgm<sup>-2</sup>a<sup>-1</sup> on the second leg. There is no clear temporal trend in SMB evident over last 400 years, as some of the cores show a decrease while others indicate no change or a slight increase in SMB. The spatial distribution is influenced mainly by elevation and continentality, thus fitting the expected pattern. GPR data indicate a spatial variability of 10-20% over several 10s of kilometers from the core sites, making the cores representative for the area around them.

SMB data from remote and largely uncovered areas are important for understanding changes and processes in the cryosphere and for estimating the mass balance of East Antarctica.