



## **SNOW ACCUMULATION OVER THE PAST DECADES: A STUDY OF SOUTHEAST GREENLAND AND WESTERN ANTARCTICA**

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The warmest years in recent climate history have been recorded in the past decades. The polar-regions are dominated by complex feedback systems and are sensitive to climatic changes. The Greenland and Antarctic ice sheets are the primary reservoirs capable of affecting sea level rise, with a combined full melt potential of 64 meters. Ice sheet behavior is monitored by considering the surface mass balance between accumulation and ablation. Accumulation rates in Greenland and Antarctica are poorly constrained, resulting in an uncertainty in the total surface mass balance. The spatial and temporal variability of snow accumulation can be observed through the study of ground penetrating radar (GPR) and ice core analysis. In this study accumulation rates were derived from GPR and ice core data from 2010, where data was collected along the Article Circle Traverse (ACT-10) in southeast Greenland and along the Satellite Era Accumulation Traverse (SEAT10) on the Western Antarctic Ice Sheet (WAIS).

The ACT-10 GPR profiles were analyzed manually, and the prominent isochronous internal reflection horizons were traced and digitized using Grapher software. The data was processed in Matlab, and accumulation was derived. The SEAT10 airborne data was processed using a NASA semi-automatic layer picker in Matlab. Depth-age relationships were established through previous analysis of ice-cores. Depth profiles and derived accumulation rates were similarly compiled for the SEAT10 data.

The derived accumulation rates are in overall agreement with the Polar MM5 climate model. Accumulation increases up to 10% in topographic depressions, which is not expressed in current climate models. Accumulation rates increase towards the margin of southeast Greenland and towards the seaward side of the WAIS. Recent changes in climate have not resulted in a significant increase in accumulation. High interannual variability and the short time scale of this study might conceal trends in accumulation. Future work will continue monitoring the spatial and temporal variability of accumulation and the influence of climate change.

