Geophysical Research Abstracts
Vol. 18, EGU2016-1346, 2016
EGU General Assembly 2016

Accumulation rates from central North Greenland during the past 700 year

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A key variable when interpreting the evolution and mass loss from polar ice sheets is the input from the surface mass balance. While ice core records contain information on past accumulation rates, they always only provide information for a single location. Here, we present spatially distributed accumulation rates from central northern Greenland, specifically the area between the NEEM (North Greenland Eemian Drilling) and NGRIP (North Greenland Ice Core Project) ice core drill sites. The accumulation rates have been reconstructed using ice-penetrating radar, firn core measurements and inverse methods, and we are able to retrieve both spatial and temporal changes in the accumulation over an area spanning 300 km by 300 km. We investigate the stability of the accumulation pattern over the past several hundred years, and we address the question of how well the measured accumulation rates at the ice core sites capture the regional variations in accumulation. We find that while the accumulation rates at NEEM have been stable for the past 700 years, the NGRIP site has experienced fluctuations in accumulation rate. We interpret this as an indication of shifts in the dominating weather pattern over the ice divide in central North Greenland.