First results from the Northeast Greenland Ice Stream (NEGIS) drilling site

P. Vallelonga[1], H.A. Kjær[1], C. Tibuleac[1], A. Svensson[1], M. Kristensen[1], T. Popp[1], C. Holme[1], Y. Weng[1], B. Vinther[1], M. Winstrup[1], D. Dahl-Jensen[1], N. Karlsson[1], S. Kipfstuhl[2], L. Peters[3] and K. Christianson[4].

[1]Centre for Ice and Climate, NBI, University of Copenhagen, Denmark.
[2]Alfred Wegener Institute, Bremerhaven, Germany
[3]Penn State, USA. [4]St Olaf College, Northfield, USA.

The Northeast Greenland Ice Stream (NEGIS) is the largest outlet stream in Greenland (Joughin, et al., 2001). Approximately 1000 km in length, it terminates in the Greenland Sea through three outlet glaciers. Radar and seismic surveys were conducted in summer 2012, as well as the drilling of a 70 m firn core at the NEGIS site (75 37.61 N, 35 56.49W).
DiElectric Profiling (DEP), Electrical Conductivity Measurement (ECM) and electrolytic conductivity have been determined on the firn core, in addition to Continuous Flow Analysis (CFA) determination of dust and major ionic impurities. The firn core chronology was established via the identification of several volcanic strata commonly found in Greenland shallow cores as well as counting of annual layers of dust, sodium and ammonium. Stable water isotope ratios in the NEGIS core are consistent with those reported from other shallow core drilling sites in Northern Greenland.
The NEGIS firn core covers approximately 400 years, with an average annual layer thickness of 0.12 m for 1600-1800 AD and 0.19 m for 1800-2011 AD (figure 1). Tracing of deeper radio echo layers indicate that the NEGIS site preserves a climatic record stretching back to at least past 55,000 years before present.

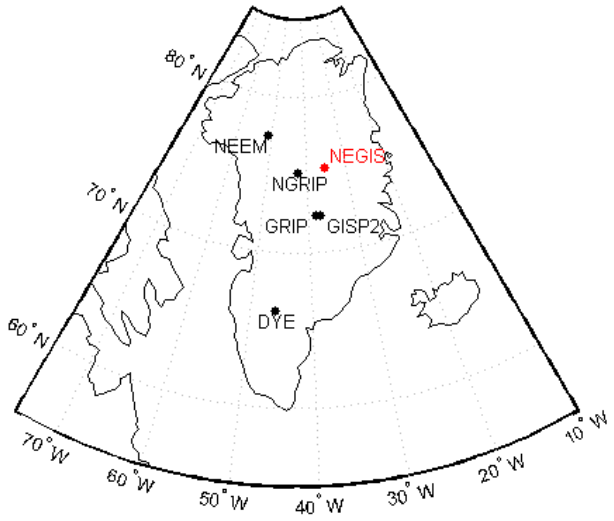

Figure 1. The position of the NEGIS firn core (red).

References

Joughin, Ian, et al. "*Observation and analysis of ice flow in the largest Greenland ice stream.*" Journal of Geophysical Research: Atmospheres, vol 106, D24, 2001