

The RABID Project: Attempts to drill to the bed of Rutford Ice Stream

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The main fieldwork for the RABID project was carried out on Rutford Ice Stream in the 2004/05 field season. The biggest scientific task was to access the ice stream bed using a hot-water drill. This would enable a number of investigations within the bed and the ice:

- Sediment sampling for dating and ice sheet history
- Tethered stakes to detect bed deformation
- Pressure sensors and borehole video camera for basal hydrology
- Instrument strings for ice column temperature and deformation as well as recent climate history
- Ice cores (and video) for fabric and sediment content.

The project also involved a substantial suite of surface geophysical measurements: seismic reflection surveys for basal conditions; GPS and passive seismic networks for ice flow and basal seismicity; and GPR for accumulation and flow pattern.

Together, these formed an integrated programme studying ice dynamics, basal conditions and climate and glacial history. Although the drilling reached within 100 m of the bottom of the ice (ice thickness ~2200 m), irretrievable equipment failure meant that we did not reach the ice stream bed. The surface work was more successful and is giving interesting results, including: rapid subglacial erosion, drumlin formation and changing bed hydrology (presented at WAIS in 2006); spatial and temporal variability in the ice flow during the fieldwork; and evidence for seasonal flow variability from a GPS receiver that recorded into the winter and re-started in the spring.