Surface exposure dating using cosmogenic isotopes: a field campaign in Marie Byrd Land and the Hudson Mountains

J. S. Johnson[1], K. Gohl[2], T. L. O'Donovan[1], M. J. Bentley[3,1]

[1]British Antarctic Survey, High Cross, Madingley Road, Cambridge. CB3 0ET. U.K.

[2]Alfred-Wegener-Institut für Polar- und Meeresforschung, Postfach 120161, D-27515 Bremerhaven. Germany.

[3]Department of Geography, Durham University, South Road, Durham. DH1 3LE. U.K.

We present preliminary findings from fieldwork undertaken in Marie Byrd Land and western Ellsworth Land in March 2006, during which we obtained the first (to our knowledge) samples for surface exposure dating from eastern Marie Byrd Land and the Hudson Mountains. This work was supported by helicopters from *RV Polarstern*, on expedition ANT XXIII/4 to Pine Island Bay.

Samples were taken from glacially-derived erratic boulders found on bedrock surfaces at Turtle Peak (near Mount Murphy), Hunt Bluff (Bear Peninsula), Mount Manthe (Hudson Mountains), and an unnamed island in Pine Island Bay. Granite and granitoid erratics were found at all locations except Hunt Bluff, where metasedimentary erratics were found lying on granite bedrock. Striated surfaces were found only at Hunt Bluff.

We plan to undertake exposure dating of the quartz-bearing boulders using the cosmogenic isotopes, ^{10}Be and ^{26}Al. Surface exposure dates from these boulders will provide a record of elevation change for the ice sheet surface in this region, and thus will help to constrain thinning of the ice sheet since the Last Glacial Maximum. They will also be used in conjunction with radiocarbon dates from marine sediments (obtained on this expedition as well as on the *RRS James Clark Ross* cruise to the Amundsen Sea in early 2006) to provide a more complete deglaciation history, i.e. to assess both the vertical and lateral retreat of the WAIS. A well-dated record of changes in the extent and thickness of the ice sheet earlier in the Quaternary will provide strong constraints for ice sheet models and thus aid efforts to predict future behaviour of the WAIS. To this end, we aim to collect a greater density of geomorphological data and samples during a BAS-supported field season to the Hudson Mountains in 2007/08.