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Stable Isotopic Investigatino of Basal Ice, Taylor Glacier Antarctica

Basal ice, debris-rich ice at the base of a glacier or ice sheet, contains particles of ground up material from the rocks and sediments the glacier flows over. The stable isotopic ratio of debris-rich ice can vary in response to the type of debris entrainment processes including direct freeze-on and basal shearing. This project will measure the stable isotope ratios of oxygen and hydrogen in melt water from debris-rich ice bands from basal ice from Taylor Glacier, Antarctica, in order to improve our understanding of basal ice formation. The 60 cm thick section (3 x 20 ice blocks) that is the focus of the study was collected in the 2007 field season as part of a research project headed by Dr. Mark Skidmore. These blocks contain debris-bands that are bracketed by clean ice layers above and below. The isotopic analysis will be conducted at the 1 cm resolution through the debris bands and in the clean ice to allow a beter understanding of the isotopic structure in laminated debris-rich ice. The isotopic data will be compared with geochemical gas chemistry data of the same ice sequence from Scott Montross' recently completed PhD theses. This analysis should lead to an improved understanding of the basal ice formation at Taylor Glacier, Antarctica.