



## **Fractal frozen-bed patches under former ice sheets and their implications for ice-sheet stability**

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Information about the subglacial thermal zonation of contemporary ice sheets is mainly derived from geophysical data (radar profiles, measured temperature profiles) or inferences on the basis of surface flow arrangement, resulting in true-time slice information which, however is restricted by a poor (at the bed) spatial resolution. The geomorphology of the exposed beds of former ice sheets, on the other hand, can provide a high-resolution spatial picture of basal thermal conditions, unfortunately with the drawback of being scrambled in the time dimension. Neither approach gives a complete picture, but they are instead complementary. We here focus on the second approach (the geomorphology of the exposed beds of former ice sheets) and discuss mapping and field evidence that has a direct bearing on the spatial arrangement of basal thermal zones under the former mid-latitude ice sheets. In exploring the dynamics of the coupled frozen patch/ice-stream system we use the geomorphological record of the exposed beds of the Laurentide, Cordilleran, Fennoscandian and British-Irish ice sheets, as reflected in remote sensing and field data. We also use RADARSAT-1 Antarctic Mapping Project (RAMP) data to make inferences concerning flow organisation beneath parts of the contemporary Antarctic Ice Sheet and compare these to the record left by the former mid-latitude ice sheets. We use these data to arrive at a coherent view of the dynamics of the phase-state mosaic under the last mid-latitude ice sheets.