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TITLE: Quantifying selective linear erosion in Antarctica *(Invited)*

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ABSTRACT BODY: David Sugden (1978) coined the term 'selective linear erosion' to describe landscapes, characteristic of high-latitude glaciated areas, that are distinguished by deep glacially excavated troughs separated by low-relief upland surfaces that show no evidence of glacial erosion. Sugden (and later researchers) proposed that this landscape form owed its existence to the thermal distribution within polar ice sheets: ice at high elevations is thin, frozen to its bed, and therefore protects rather than erodes the landscape; thicker ice in topographic depressions can sustain basal melting with consequent erosion by hydraulic and thermodynamic processes. This contrast in basal thermal regime implies an extreme contrast in erosion rates, which amplifies preexisting relief and gives rise to landscapes of selective linear erosion. These landscapes are currently exposed in formerly glaciated high-latitude regions of the northern continents. They also exist beneath the Antarctic ice sheets, where presumably the processes responsible for their formation are currently active. Here we argue that understanding how and when these landscapes form is important to understanding how ice sheets mediate climate-landscape interactions. However, the facts that: i) the processes in question occur beneath the modern Antarctic ice sheet, and ii) currently unglaciated portions of glacier troughs in Arctic and Antarctic landscapes are nearly universally submerged, present several challenges to attaining this understanding. Here we summarize geochemical and geochronological means of addressing these challenges. These include: first, cosmogenic-nuclide measurements that establish the Plio-Pleistocene erosion history of high-elevation plateau surfaces; second, thermochronometric observations on debris shed by glaciers occupying major troughs that provide information about when and how fast these troughs formed.

KEYWORDS: [0726] CRYOSPHERE / Ice sheets, [1150] GEOCHRONOLOGY / Cosmogenic-nuclide exposure dating, [1140] GEOCHRONOLOGY / Thermochronology, [9310] GEOGRAPHIC LOCATION / Antarctica.

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