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The influence of microenvironment on post-glacial chemical weathering, Storbreen, Jotunheimen Mountains, Norway.

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Chemical weathering is invariably associated with increased rock porosity. Using porosity as a surrogate measure for weathering we have investigated weathering variability at Storbreen, a cirque glacier in the Jotunheimen Mountains of central Norway. Granulite pyroxene gneiss cobble samples were drawn from a 9 000 year-old surface beyond the deglaciated glacier foreland, the Little Ice Age terminal moraine demarcating the foreland (dated to $\sim$1750 AD), and selected younger recessional moraines within the foreland. At each sampling site, bare and lichen-covered surficial cobbles, plus cobbles buried within the soil C horizon were selected. Depth of weathering was determined by calculating porosity in 100-micron interval transects beneath the cobble surfaces using a scanning electron microprobe. While freshly deglaciated surfaces and tills are commonly taken to be unweathered, the presence of reworked material must be accepted. In either case it must be recognized that materials are subsequently exposed to a wide range of ground microenvironments that drive weathering. Consequently, dated glacier forelands provide useful landscapes within which to identify variability in both the nature and rates of chemical weathering. Statistical analysis of rank-ordered transformations of percentage porosity data identified statistically significant at-a-site differences between bare and lichen-covered cobble surfaces, and between surface and buried cobbles. At-a-site weathering increases in the order: bare $<$ lichen-covered $<$ buried cobbles. While weathering increases with age between the 9 000 year-old and 1750 surfaces, differences were not detectable among materials in

moraines younger than 1750.