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A ten-year record of chemical weathering within Karkevagge, Swedish Lapland.

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In 1994 three soil pits were excavated in each of the principle vegetation cover types of Karkevagge ('valley of the boulders'), Swedish Lapland. Within each pit multiple machine-polished disks of dolomite, granite, and limestone were embedded to depths of $\sim$60 cm. Adjacent to each pit one bag each of dolomite and granites pebbles (Wentworth scale) sealed in a mesh bag was pinned to the vegetation surface. The vegetation communities studied were alpine tundra, birch, heath, meadow, and solifluction meadow, to which were added *Dryas* heath and willow communities in 1995. All pits were excavated in 1999 and 2004. The study design permits spatial and temporal evaluation of weathering patterns within Karkevagge for two five-year periods, as well as creation of a ten-year record.

Weathering rates among both disks and bags were limestone $>$ dolomite $>$ granite. The spatial variability indicated that wet and generally more acidic environments, such as the meadows and willows, weathered at statistically higher rates than did the heath environments over five-year periods. There were also statistically significant temporal distinctions with dolomite and limestone weathering faster during the second five-period than in the first. Both five-year periods had warmer and wetter air climates than the 1961-1990 thirty-year average, although air and ground climates are only weakly linked in detail. Granite weathering rates were too slow to establish statistically significant spatial or temporal patterns of behavior. Subsurface and surficial weathering rates for all rock types were generally comparable. Minimum and maximum total decadal percentage mass losses for disks were0.2 and 25.7 for dolomite, 0.07 and 0.57 for granite, and 0.2 and 32.1 for limestone; for pebble bags the comparable values were 1.2 and 13.9 for dolomite and 0.4 and 4.54 for granite.