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Blockfield Origins: Neogene or Quaternary?

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The prevailing paradigm for cold-climate *in situ* blockfields is that they are remnants of Neogene deep weathering profiles. This opinion is frequently based on the presence of large quantities of interstitial silt and clay and/or the presence of clay minerals, such as gibbsite and kaolinite. Using *in situ*-produced cosmogenic isotopes ^{10}Be and ^{26}Al, XRD, and XRF to study blockfield regolith in the northern Swedish mountains, we challenge this paradigm. Incorporating surface burial by ice sheets, the isostatic response to ice sheet loading and unloading, and subaerial surface erosion, the cosmogenic data indicate that the regolith has been accumulating nuclides for up to 464.5 ka. The ubiquitous presence of chlorite makes it impossible to distinguish kaolinite according to standard XRD techniques. However, gibbsite is present in glacial till in addition to wet-location blockfield regolith. Coupled with the ubiquitous presence of poorly crystallized hydroxides, vermiculization in wet-locations, and an absence of smectite, incipient chemical weathering is indicated. Furthermore, XRF data indicate dominance of the interstitial fine matrix by a foreign component, likely of aeolian origin. All of our observations can be explained by processes operating within the Quaternary timeframe. Because we do not need to appeal to Neogene deep weathering to account for the characteristics of blockfields in the northern Swedish mountains we conclude that these blockfields may have Quaternary origins.