

# **Weathering Geochemistry in Late Neoproterozoic Indicated by Saprolite Profiles from the Great Unconformity, Trace Metals and Rare Earth Elements Approach.**

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The Precambrian-Cambrian stratigraphic profiles observed in North America are described as a Great Unconformity. A long period of continental denudation exposed the igneous continental basement to extensive chemical weathering by a Cambrian oceanic transgression that reworked and deposited detrital saprolites unconformably over the Precambrian granitic and gneissic basement. While the effects of continental material translocations and interactions with the Cambrian Ocean during the marine transgression are still being debated, they may have contributed to early Cambrian biodiversification[1]. However, the characterization of such continental chemical weathering in the late Neoproterozoic remains largely unknown. Through a trace metal and rare earth elements (REE) approach, we hope to characterize the continental weathering intensity by analyzing saprolite and sandstone weathering profiles atop the Precambrian igneous and metamorphic basement in the Bighorn Basin and Wind River Valley, WY. Preliminary investigations, including tau mass transport models, of the samples from the Wind River Valley indicate an extensive depletion of major elements. REE distributions shows progressively decreasing  $Eu/Eu^*$  from the parent basement and constant  $Ce/Ce^*$ , implying the alteration of plagioclase minerals under subaerial weatherings.

[1]Peters & Gaines 2012, Nature, 484(7394), 363–366.