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Oxisolic processes and geochemical constraints on duration of weathering for Neoproterozoic Baltic paleosol

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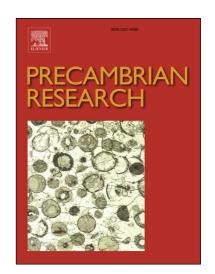
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- 1 Oxisolic processes and geochemical constraints on duration of weathering for
- 2 Neoproterozoic Baltic paleosol
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12 ABSTRACT

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A transient greenhouse warming event during the late Neoproterozoic has been invoked to explain the incongruence of cooler temperatures and intense weathering at high latitudes. We explore this further by examining three deep weathering profiles of the Neoproterozoic Baltic paleosol (600-560 Ma). These profiles have an Oxisolic horizon dominated by quartz, kaolinite, phlogopite/vermiculite, hematite and goethite. Mass-balance calculations (assuming immobile Al₂O₃) for the newly characterized Erra profile studied here showed loss of 25-50% SiO₂ and MgO₂ complete loss of CaO and Na₂O, 25-50% loss of K₂O, and 25-100% gain in Fe₂O₃ in the upper Oxisolic horizon. pH was estimated as moderately acid to very acidic (4.5-6) during weathering using a new paleo-pH proxy. MAP (1500-1600 mm yr⁻¹: CIA-K) and MAT (13-15(+) °C: PPM_{1.0}) were also estimated using bulk geochemical proxies. Calculations for *p*CO₂ follow an earlier thermodynamic method with evaluation of total mass flux for CaO, MgO,

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