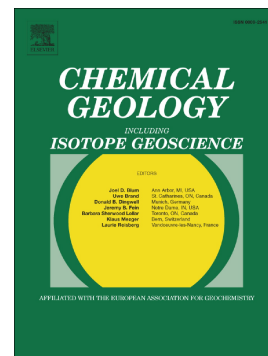


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Continental Weathering and Terrestrial (Oxyhydr)oxide Export: Comparing Glacial and Non-glacial Catchments in Iceland.

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Abstract

Glaciers enhance terrestrial erosion and sediment export to the ocean. Glaciers can also impact mineral specific weathering rates relative to analogous non-glacial terrains. In tandem these processes affect continent sediment export to the oceans over glacial-interglacial cycles. This study summarizes field data from glacial and non-glacial Icelandic river catchments to quantify the impact of weathering regime on iron and aluminium (oxyhydr)oxide mineral formation and flux rates. Aluminium and iron (oxyhydr)oxides are strong indicators of organic carbon preservation in soils and marine sediments. Tracing changes in (oxyhydr)oxide formation and deposition therefore provides a means of evaluating potential changes in organic carbon sequestration rates over glacial-interglacial cycles. Overall, there are several measurable chemical differences between the studied glacial and non-glacial catchments which reflect the key role of soil formation on terrestrial weathering. One of the noted chemical difference is that weathering in non-glacial catchments is characterized by higher apparent rates of iron and aluminium (oxyhydr)oxide formation relative to glacial catchments. However, the offset in (oxyhydr)oxide formation does not appear to be transferred into river sediment compositions, and physical weathering appears to be the dominant control of river sediment composition and export. Glacial rivers export far more total sediment to nearshore marine environments than analogous non-glacial

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