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# Calcium isotopes and environmental conditions in the aftermath of a Cryogenian glaciation

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Calcium isotope excursions in Neoproterozoic carbonate profiles provide a window onto the recovery of the Earth System from an ocean acidification event and elevated atmospheric greenhouse gas excursion in the aftermath of a Marinoan aged glaciation. The general Ca isotope pattern preserved in carbonate rocks from Namibia indicates a temporary global shift ($\delta^{44}$Ca $\sim$0.5‰ ) of the ocean as a result of an enhanced (silicate) rock weathering influx following the demise of a global glaciation and the increase in global temperature and precipitation in the greenhouse aftermath. This enabled the ocean to return to a state of ocean pH normalcy after the climatic amelioration. Regional differences in the timing and the magnitude of the Ca isotope variation across the palaeocontinental margin of the Congo Craton suggest a local influence overprinting and amplifying the global pattern by as much as 2‰ . Consequently, extreme regional signals can lead to an overestimate of the global chemical weathering flux. The observed regional differences in the $\delta^{44}$Ca profiles for the Namibian transect are potentially controlled by limited mixing between the open ocean and the shallow water of the continental platform, the rate of carbonate precipitation as well mineralogy (e.g. calcite/aragonite). The local control on the $\delta^{44}$Ca pattern does, though, provide a unique opportunity to improve our understanding of, and ability to reconstruct, the environmental conditions associated with the Neoproterozoic climatic changes.