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# A reconstruction of ocean $\delta^{26}$Mg in the Triassic from dolostones and a new model of Earth surface recovery following the End-Permian

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Ocean $\delta^{26}$Mg is controlled by three primary Earth surface processes: continental weathering (delivered as riverine and groundwater flux), removal by hydrothermal flux through the sea floor, and removal by dolomite formation to produce dolostone ($CaMg(CO_3)_2$). The abundant dolostones in the geologic record are a major host of Mg sourced primarily from seawater with a well-defined isotope fractionation factor during dolomitization [1]. Using detailed petrographic and geochemical analysis, dolostones can be selected that were dolomitized during or soon after deposition by fluids of seawater $\delta^{26}$Mg composition, and which are therefore archives of seawater $\delta^{26}$Mg values.

In this study, we analyse Triassic dolostones from southern Switzerland and present reconstructions of seawater $\delta^{26}$Mg from the Middle and Upper Triassic (244 and 220 Ma) to be considered together with previous such reconstructions from the Lower Triassic [2][3]. By combining these data with published reconstructions of the Triassic ocean Mg concentration [4][5] , and with a model of modern ocean Mg fluxes [6], we have modelled the shifts in isotope composition of magnesium in the ocean throughout the Triassic and the surface processes leading to the observed changes. Our results demonstrate the extreme swings in Earth surface conditions that must have existed following the severe environmental perturbations associated with the End-Permian Mass Extinction and the possible role of microbial life during Earth surface recovery from the event.

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