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Can submarine super-eruptions lead to oceanic anoxic events?

N.R. Edwards and S. Self
Open University, UK (n.r.edwards@open.ac.uk)

The striking coincidence between estimated dates of emplacement of large igneous provinces (LIPs) and occurences of oceanic anoxic events (OAEs) has led to a popular hypothesis of causality which is so far virtually untested in well-resolved numerical climate models. Using the intermediate complexity GENIE Earth system model allows us to resolve changes in ocean circulation and chemistry in three dimensions while investigating a range of plausible volcanogenic input scenarios in simulations of 100 kyear duration. By focusing on the mostly submarine emplacement of the Ontong-Java Plateau in the early Cretaceous, we avoid the worst numerical difficulties associated with modelling subaerial super-eruptions. Initial results show that the long-term behaviour is dominated by the buildup of atmospheric carbon dioxide even though this can, in some circumstances, lead to a significant reduction in ocean carbon storage as sedimentary drawdown increases.