Massive subaerial volcanism associated with Oceanic Anoxic Event 2?

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The geological record is punctuated by intervals of widespread organic carbon (OC) enrichment known as Oceanic Anoxic Events (OAEs). These are commonly interpreted to represent expanded oceanic anoxia, and potentially offer us a valuable window into our ocean's future. This is particularly pertinent with predictions of a warming-induced, ~10% decrease in oceanic oxygen inventories by 2100 [1] underlining the need to better understand the causes and consequences of widespread marine anoxia.

The latest Cenomanian aged OAE 2 (≈94 Myr ago) is considered the best developed and most widespread of the OAEs, as it shows evidence of deep-water anoxia as well as a general continuity of organic-rich black shale deposition across the Atlantic and Tethyan realms. Recent work has linked anoxia and widespread deposition of marine black shales during OAE 2 to massive submarine volcanism [2-5], most likely associated to emplacement of the Caribbean LIP [5]. Alternatively, several studies offer tantalizing clues for massive subaerial volcanism immediately preceding OAE 2, with Pb isotope [6] as well as clay mineral evidence [7] for an influx of subaerially erupted and weathered volcanic detritus.

Here we present detrital ε_{Nd} & $^{87}Sr/^{86}Sr$ records from two IODP sites spanning the OAE 2 interval, testing for a shift towards young, mantle-like Sr and Nd isotopic ratios predicted by the massive subaerial volcanism hypothesis, and discuss the influence an influx of volcanically derived detrital material has for the use of the ε_{Nd} palaeocirculation proxy during OAE 2.

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