Seawater $^{187}Os/^{188}Os$ Variations during the Mid-Cenomanian Event

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Variations in the initial, seawater-derived $^{187}Os/^{188}Os$ (Os_i) signatures of shales deposited during ocean anoxic events (OAEs) are variously interpreted as evidence for transient increases in continetal weathering, and the emplacement and subsequent weathering of large igneous provinces (LIPs) [1]. When paired with other geochemical evidence, shifts toward low, unradiogenic values of Os_i at the onset of OAEs suggest that vigorous LIP activity may have played a role in the triggering of OAEs. However, whether all OAEs are characterized by such Os_i changes, and the temporal relationship between Os_i fluctuations and the onset of OAEs, remain uncertain.

To further our understanding of the relationship between Os_i and OAEs, we determined the Os_i chemostratigraphic profile of the Mid-Cenomanian Event (MCE), as recorded in the Eagle Ford Group (SW Texas). Unlike Ocean Anoxic Event 2 (OAE-2), which follows the MCE by ~2 Ma, the MCE has received comparatively little study. Samples used in our study come from the Iona-1 research core, which records a complete record of the Cenomanian-Turonian of the Cretaceous Western Interior Seaway [2-3]. The presence of both unradiogenic (low Os_i) and radiogenic (high Os_i) intervals during the MCE implies the balance of the sources of osmium to seawater systematically varied throughout the event. Although Os_i variations during the MCE interval appear muted compared to those of OAE-2, our data suggest that a LIP supplied unradiogenic Os to the ocean during the event. Additionally, an unusually radiogenic Os_i signal at the beginning of the event is likely the result of a sudden increase in weathering of the surrounding continents.

[1] Peucker-Ehrenbrink & Ravizza (2012) *The Geologic Time Scale*, 145-166. [2] Eldrett *et al.* (2014) *Geology* **42**, 567-570. [3] Minisini *et al*., (2018) *Sedimentology* https://doi.org/10.1111/sed.12437.