$\delta^{18}O$ records of circulation, sea level, and climate in the Western Interior Seaway during OAE2

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Stratigraphic records of Late Cretaceous Oceanic Anoxic Event 2 (OAE2, ~94 Ma) preserve evidence of a complex global climatic response to large igneous province volcanism. A new compilation of stratigraphic and geochronologic data from the central Western Interior of North America provides a foundation for further analysis of OAE2. Previous proxy records spanning the onset of the event indicate an interval of elevated pCO_2 was followed in Europe by the Plenus Cold Event, an interval of cooling presumably driven by the massive increase in net organic carbon burial [1]. To test the hypothesis of cooling in the epicontinental Western Interior Seaway (WIS), we present a transect of oxygen isotope ($\delta^{18}O$) chemostratigraphic profiles of OAE2. This spans the basin from the proximal foredeep of Utah (SH#1 Core) to the distal carbonate-rich axial basin in South Dakota (BGS Section). Enrichments in $\delta^{18}O$ values are observed in many locations above the base of the positive $\delta^{13}C$ excursion marking the onset of OAE2 and overlying a regional flooding surface. However, the nature and magnitude of isotopic shifts vary depending on locality and sample material analysed (bulk rock, microfossil shell material, or mollusc shell material). Complexity in the basin-scale $\delta^{18}O$ records reflect an interplay of changing climatic conditions and water mass dynamics. Additionally, diagenesis, driven by sea level oscillations during OAE2 and/or burial temperatures exceeding the oil window, plays a role in some sites. Enriched $\delta^{18}O$ values in the WIS, coeval with the Plenus Event in Europe, are consistent with cooling, however, microfossil datasets suggest changes in salinity (i.e., water mass) is a plausible driver of geochemical trends as well.

[1] Jenkyns et al. (2017), *Sedimentology* 64, 16-43.