

Drivers of anoxia in an epicontinental seaway – An organic geochemical transect across the Cretaceous Interior Seaway

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The Cretaceous Western Interior Seaway (WIS) of North America has an enigmatic history of oxygenation. This shallow epeiric basin was intermittently transgressed during times of high sea level and at its greatest stretched from the Gulf of Mexico to the Arctic Ocean, from palaeo-latitudes of 30° N to 75°N. When investigated at a high resolution, anoxic trends within this basin have been shown to be diachronous to those seen globally during global Ocean Anoxic Events.

Various hypotheses have been proposed to account for the dynamic oxygenation in the WIS, including the presence of an anti-clockwise gyre, downwelling (caballing) of oxygenated surface-waters at the mixing front of Tethyan and Boreal waters, restriction-driven stratification and Ekman-transport driven upwelling.

To investigate these hypotheses biomarker and isotopic data are analysed to understand the physical and biogeochemical evolution of the WIS during the mid-Cretaceous, including variations in organic matter provenance and preservation, water column oxygenation, stratification and terrestrial organic matter input.