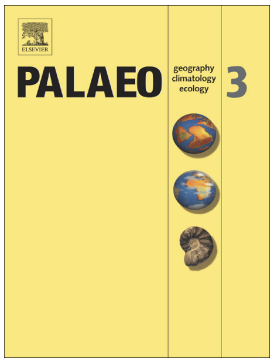

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Ichnofabrics and chemostratigraphy argue against persistent anoxia during the Upper Kellwasser Event in New York State

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Abstract

Organic-rich strata coeval with bioevents of varying magnitudes characterize global Devonian sedimentary successions. The Upper Kellwasser (UKw) black shale depositional event is coincident with the largest pulse of diversity loss within the marine Late Devonian mass extinction and has been shown to be an ecologically critical turnover for shallow-water species. Marine anoxia/euxinia is widely thought to be an important and ubiquitous driver of this biotic crisis, though the duration, intensity, and global extent of these environmental conditions during the UKw event are not well-constrained.

We characterized redox conditions during deposition of the UKw in the northern Appalachian Basin to constrain local variability and relative magnitude of dissolved oxygen fluctuations. We used a combination of proxies relating to the bottom waters, water column, and photic zone to compile an integrated picture of basinal oxygen dynamics. Our multi-faceted approach combines trace fossil evidence for faunal activity at the sediment-water interface with inorganic and organic geochemical proxies for redox conditions within the water column. Minor