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APPLICATION OF THALLIUM ISOTOPES

Tracking Marine Oxygenation Through Manganese Oxide Burial

Jeremy D. Owens
Florida State University
National High Magnetic Field Laboratory

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Jeremy D. Owens
Florida State University and National High Magnetic Field Laboratory

Author for correspondence: Jeremy D. Owens, jdowens@fsu.edu

Abstract: Tracking initial ocean (de)oxygenation is critical to better constrain the coevolution of life and environment. Development of thallium isotopes has provided evidence to track the global manganese oxide burial that responds to early (de)oxygenation for short-term climate events. Modern oxic seawater thallium isotope values are recorded in organic-rich sediments deposited below an anoxic water column. An expansion of reducing conditions decrease manganese oxide burial and shift the seawater thallium isotope composition more positive. Recent work documents that thallium isotopes are perturbed prior to carbon isotope excursions, suggesting ocean deoxygenation is a precursor for increased organic carbon burial.

Keywords: deoxygenation, ε^{205}Tl, oceanic anoxic events, post-oxic, redox

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