COUPLED CAMBRIAN C AND Sr SEAWATER SECULAR ISOTOPE VARIATIONS RECORDED IN LATEST EARLY TO LATE CAMBRIAN CARBONATES, NORTH AMERICAN CORDILLERAN MARGIN

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A high-resolution isotope and relative sea-level study of latest Early through earliest Late Cambrian carbonates of the U.S. and Canadian Cordilleran margin significantly refines the structure of the existing seawater Sr isotope curve by (1) constraining the highest seawater 87Sr/86Sr values (0.7093) over the past 2 b.y. to the latest Middle Cambrian to earliest Late Cambrian, and (2) by bridging a 'Middle Cambrian' gap in the apparent long-term increase in seawater 87Sr/86Sr values beginning in Early Cambrian time (Derry et al., 1994). Significantly, the magnitude and rate of increase in seawater 87Sr/86Sr values during the Early through earliest Late Cambrian (0.00004 to 0.00005/m.y.) overlap to exceed the Tertiary rise in seawater 87Sr/86Sr values over the last 40 m.y.. We interpret the rapid, near linear rise in seawater 87Sr/86Sr values throughout the Early and Middle Cambrian to record the tectonic evolution of the Pan-African Orogeny. The potentially unprecedented rapid rates of increase in seawater 87Sr/86Sr values may indicate that this orogenic event was of greater magnitude than subsequent major Phanerozoic orogenies.Paired high resolution 87Sr/86Sr and d13C variations occur at the Early to Middle Cambrian boundary interval, and the Middle to Late Cambrian boundary interval. Short-term C and Sr isotope trends exhibit a complex relationship with trilobite biomere boundaries and short-term sea-level events suggesting a potential mechanistic link between processes controlling the Sr and C isotope composition of Cambrian oceans, high-frequency sea level fluctuations and trilobite extinction events.