

## Permian Panthalassan Sr budget change

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The radiogenic Sr isotopic composition ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) of the Phanerozoic seawater has been fluctuated according to global tectonics and/or climate change. The major Sr fluxes to drive  $^{87}\text{Sr}/^{86}\text{Sr}$  in seawater are three-fold; i.e., weathering of highly radiogenic continental silicates, non-radiogenic submarine hydrothermal fluid, and weathering of less radiogenic carbonates and basalts from island arc/oceanic island. During the Phanerozoic, seawater  $^{87}\text{Sr}/^{86}\text{Sr}$  changed most dramatically around the Middle/Late Permian boundary marked by a major mass extinction. Stable Sr isotope ( $\delta^{88}\text{Sr}$ ) in seawater is recently recognized as an useful proxy for estimating ancient burial/dissolution of marine carbonate. The  $\delta^{88}\text{Sr}$  values were consistently low in the Middle Permian and began to increase during the Late Permian. The timing of this trend change across the G-LB corresponds to that of  $^{87}\text{Sr}/^{86}\text{Sr}$ . This significant change of ocean Sr budget in the Phanerozoic might be explained by increase/decrease of carbonate weathering on continental shelves with respect to the long-term cooling/warming associated with global sea level change.

Keywords:  $\delta^{88}\text{Sr}$ ,  $^{87}\text{Sr}/^{86}\text{Sr}$ , carbonate, seawater