Goldschmidt 2024 Abstract
https://doi.org/10.46247/gold2024.22718

# Exploring the Effect of Diagenesis on the $\delta^{88}Sr$ Composition of Shallow Marine Carbonates

**MATTHEW D NADEAU** AND JOHN A HIGGINS

Princeton University

Presenting Author: matthew.daniel.nadeau@gmail.com

Records of the strontium isotopic composition of seawater ($d^{88}Sr_{sw}$ and $^{87}Sr/^{86}Sr$) may offer the potential for detecting changes in continental weathering, hydro-thermal activity, and carbonate deposition throughout the geological past. Shallow-water carbonates may serve as an archive of the stable strontium isotopic composition of ancient seawater; however, interpreting the isotopic signals is complicated by the effects of diagenesis. Here, we explore the effects of marine and meteoric carbonate diagenesis on $d^{88}Sr_{carb}$ using a suite of geochemical proxies ($d^{7}Li$, $d^{13}C$, $d^{18}O$, $d^{26}Mg$, $d^{44}Ca$, $d^{88}Sr$, [Mg], [Ca], [Sr], [Li]) from a well-studied Modern-to- Neogene age carbonate rocks and sediment from the Great Bahama Bank (GBB). Our sample suite includes modern surface sediment and modern-to-Neogene age core sites from carbonate platform and slope environments. The diagenetic history of the GBB consists of periods of both marine alteration and meteoric alteration associated with Late Pleistocene sea-level low-stands. We apply a numerical mass-balance model of carbonate diagenesis to evaluate the impact of marine and meteoric diagenetic alteration on $d^{88}Sr_{carb}$. This work has broad implications for interpreting stratigraphic variability from shallow-water carbonate sediments and constructing secular variations in the isotopic compositions of seawater.