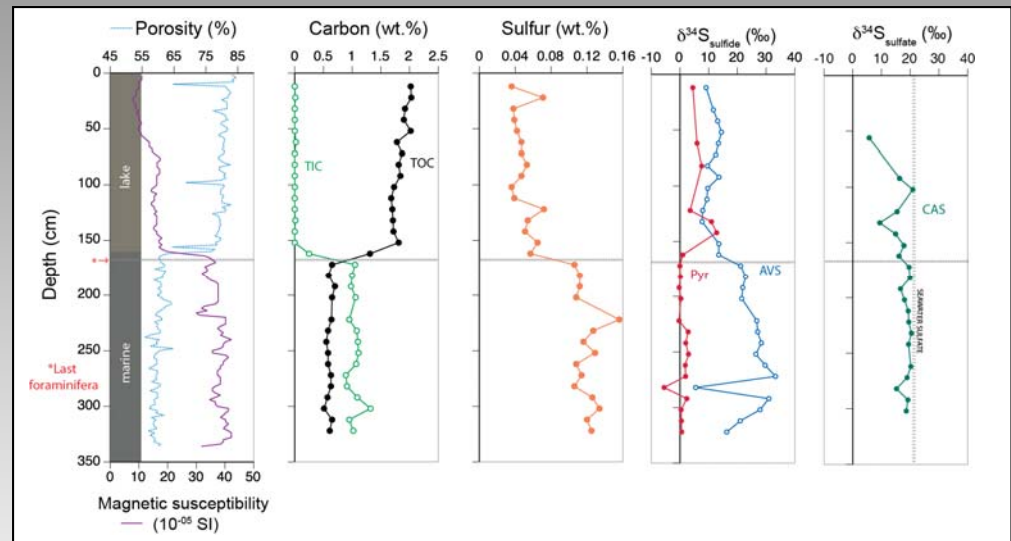


# Distinguishing Between Marine and Nonmarine Deposition on Early Earth: New Perspectives on Precambrian Source Rocks Gained from Modern Lakes

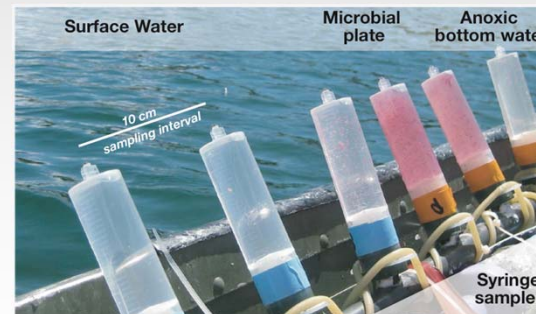
Timothy W. Lyons and William P. Gilhooly III, Department of Earth Sciences, University of California Riverside, Riverside CA 92521

## Freshwater Lacustrine to Marine Transition (an update):

Our study of Lake Champlain continues to reveal geochemical patterns that track the balance between seawater and freshwater. Sulfate ions extracted from calcite minerals provides a record of paleo-seawater and paleo-lake water. Marine sulfate has characteristically high sulfur isotope values. These exciting new results add an additional tool for differentiating marine/nonmarine deposition.



**Sulfidic Lakes:** Anoxic and sulfidic aquatic environments promote organic matter preservation. Marginal marine systems such as the Black Sea contain free sulfide; however, inland lakes may also have a large reduced sulfur reservoir. Our studies into stratified Mahoney Lake, reveal biologically mediated sulfide production and consumption within the photic zone and production within the sediments.



Gilhooly syringe sampler designed to collect water column samples across the anoxic interface. Pink layer contains photosynthetic sulfide oxidizing bacteria positioned where sulfide first appears (7 m).

