

## ORAL PRESENTATION

### ASSESSING THE HIERARCHY OF ENVIRONMENTAL CONTROLS ON DIATOM COMMUNITIES OF YELLOWSTONE NATIONAL PARK

Victoria L.S. Chraïbi<sup>1</sup>, Sherilyn C. Fritz<sup>2</sup>, Robert E. Gresswell<sup>3</sup>, Jeffery R. Stone<sup>4</sup>, Yanbin Lu<sup>5</sup>

<sup>1</sup>Department of Biological Sciences, Tarleton State University, Stephenville, TX 76402, USA

<sup>2</sup>Department of Earth and Atmospheric Sciences, University of Nebraska-Lincoln, Lincoln, NE 68588, USA

<sup>3</sup>USGS and Department of Ecology, Montana State University, Bozeman, MT 59717, USA

<sup>4</sup>Department of Earth and Environmental Systems, Indiana State University, Terre Haute, IN 47809, USA

<sup>5</sup>Paleo-Data, Inc., New Orleans, LA 70124, USA

Environmental conditions fundamentally determine ecological resilience, which we define as an ecosystem's ability to maintain structure and function during disturbance. We characterized lacustrine sediment cores from Yellowstone National Park for structure using fossil diatom assemblages and for function using algal and geochemical proxies of productivity. In one study, climate was the primary environmental control on community assemblage and productivity via its interaction with lake hydrology. A second study underlines that environmental conditions may mediate climate impacts in complex ways. *Lindavia bodanica* has displayed the same trend in size diminution observed in centric diatoms in many other Northern hemisphere lakes over the past century in correlation with increasing temperature. However, we found that earlier fossil diatom records from the same region showed no evidence of size diminution during the Holocene Insolation Maximum approximately 10,000 years ago. While the modern trend may be due in part to a changing climate and longer summer stratification, there may also be other factors at work; notable possibilities include increasing nitrogen, salinity, and alkalinity. Overall, climate exerts a primary environmental control on lake ecosystems, while catchment processes exert a secondary environmental control.