

# **Paleoenvironmental Variations, Timing, and Drivers of Wilkins Peak Member Lake Cycles, Green River Formation, Bridger Basin, Wyoming.**

**Elizabeth Klonowski<sup>1</sup>**

<sup>1</sup>Binghamton University, Sedimentology, Binghamton, NY USA  
liz.klonowski@gmail.com

## **ABSTRACT**

Meter-scale lake expansion-contraction cycles have long been recognized in the Wilkins Peak Member (WPM) of the Green River Formation (GRF), Bridger Basin, Wyoming (Eugster and Hardie, 1975; Fischer and Roberts, 1991; Pietras and Carroll, 2006). I propose to re-examine the WPM expansion-contraction cycles from study of basin-center cores for the first time. Basincenter cores, rich in evaporites and oil shales deposited at the hydrologic low point, provide the most complete record of Bridger Basin sedimentation. This study will examine the sedimentological and petrographic features, mineralogy, and carbonate mineral stable isotopes of the newly-drilled Solvay S-34-1 core located in the central Bridger Basin (Figure 1). The core contains a ~600 m record spanning most of the GRF and the entire WPM. Recent Ar-Ar and UPb dating of Bridger Basin tuffs (Smith et al., 2008, 2014; Machlus et al., 2015) will provide improved dating of the WPM and its sedimentary cycles. The goal of this study is to 1) describe the evaporites and associated sediments in the Solvay core, using hand samples, thin sections, and scanning electron microscopy, 2) document mineralogy of the Solvay core using x-ray diffraction, 3) document the oxygen isotope record of WPM carbonate minerals, 4) interpret the WPM expansion-contraction cycles in terms of paleoenvironments and lake water chemistry using the computer program EQL/EVP, 5) determine the average duration of depositional cycles using recently published tuff dates and, 6) interpret the insolation and climate variations that may have caused paleolake level changes and expansion-contraction cycles.