

**AAPG Annual Meeting  
March 10-13, 2002  
Houston, Texas**

Jeffrey T. Pietras<sup>1</sup>, Meredith K. Rhodes<sup>1</sup>, Alan R. Carroll<sup>1</sup> (1) UW-Madison, Madison, WI

## **Controls on Lacustrine Reservoir Development: Examples from the Eocene Green River Formation, Wyoming**

Lacustrine sandstone units are important petroleum reservoirs in many basins. Detailed field examination of several sandstone units interbedded with organic-rich mudstones of the Green River Formation reveals several distinctly different controls on the development of reservoir facies, including changes in paleoclimate, basin tectonics, and regional magmatism. Three distinctly different modes of lacustrine sandstone deposition may be distinguished based on sedimentary facies, sequence stratigraphy, and sandstone provenance. First, numerous arkosic sandstone beds, characterized by climbing ripple-laminated facies, occur within the Wilkins Peak Member. These typically overlie exposure surfaces marked by paleosols, and are interpreted as transgressive sheetflood deposits derived from basin-bounding Precambrian-cored uplifts. Their occurrence is inferred to be tied to repeated precipitation-evaporation cycles of Lake Gosiute. In contrast, the Farson Sandstone Member records an episode of deltaic deposition by major through-going river systems. Deposition ceased and a major sequence boundary formed when renewed tectonic uplift of the Wind River Range diverted drainage away from the basin. Structural modifications of the basin margins therefore appear to have exerted a more significant control on this type of reservoir than did climatic variation. Finally, deposition of the volcanoclastic "buff marker" and Sand Butte Bed of the Laney Member appear to correlate with a specific eruptive interval within the Absaroka volcanic field to the north, based on recent geochronologic investigations. Extrabasinal magmatic processes thus appear to have been more important to reservoir development at this time than either climate or tectonics.