

USING PALEOHYDRAULICS TO DETERMINE THE EFFECTS OF GRAIN SORTING ON PROVENANCE SIGNATURE IN THE PENNSYLVANIAN-PERMIAN CUTLER GROUP - PARADOX BASIN, UTAH AND COLORADO

Clyde Findlay

Texas A&M University, Geology, College Station, TX, TX, USA
clyde.findlay@gmail.com

ABSTRACT

Detrital zircon geochronology and modal sandstone composition are established provenance methods used to determine sediment transport pathways and tectonic reconstructions (Dickinson and Gehrels, 2003; 2009). However, the accuracy of these methods can be affected by hydraulic (e.g., fluvial) sorting of sediment (Bonich et al., 2014; Malusa et al., 2015). Sorting occurs with temporal and spatial changes in hydraulic conditions, which, in turn, can bias ages and framework grain assemblages. Thus, determining the position of a sample along a fluvial system is critical for interpreting provenance signals. This proposal will couple paleohydraulic reconstructions with detrital zircon geochronology to determine the role of sediment sorting on spatial variability of provenance signals and unravel sediment mixing patterns associated with tributary fluvial systems. Hydraulic reconstruction of the Pennsylvanian-Permian Cutler Group in the Paradox Basin will determine paleo flow depth, width, slope, velocity, and discharge (Leclair and Bridge, 2001; Williams et al., 2009) along a source-to-sink transect. Paleohydraulic reconstructions will inform downstream changes to paleocatchment size, sediment flux of transport systems, and volume of downstream deposits. Combined with provenance, sediment flux of transport systems will be used to develop models of sediment mixing from different sources and transport pathways.

AAPG Search and Discovery Article #90298 © 2017 AAPG Foundation 2016 Grants-in-Aid Projects