

Facies architecture and syntectonic fold geometry of fluvial conglomerate in the Cretaceous Nanushuk Formation, Brooks Range foothills, Alaska

Emily S. Finzel
University of Alaska – Fairbanks
Department of Geology & Geophysics
Fairbanks, Alaska
ftesf@uaf.edu

Analysis of facies architecture and structural geometry reveals the fluvial style and syndeformational character of conglomerate in the upper part of the Nanushuk Formation, which filled the basin north of the Brooks Range in mid-Cretaceous time. The conglomeratic part of the section is exposed as benches on the north and south flanks of the Arc Mountain anticline along the Kanayut River. Photo mosaics of each bench and sixty-eight measured sections were used to analyze fluvial architecture. Eight facies were used to identify architectural elements including gravel bars, sediment-gravity-flow deposits, sandy bedforms, and scours of a gravel-bed-braided river. Strata on the south limb of the anticline increase in thickness away from the anticline and decrease in dip upsection. These characteristics demonstrate syndeformational deposition of the conglomerate with the growth of the south limb of the Arc Mountain anticline. This provides new evidence for contractional deformation in the northern foothills of the Brooks Range during the mid-Cretaceous. It also provides clues to the character of potential reservoir rocks from the same stratigraphic unit that are present in the subsurface of the National Petroleum Reserve in Alaska, which is important for continued recovery of natural resources on the North Slope.