

# Changing Fluvial Style Across the Permian-Triassic Boundary: Beardmore Glacier Region, Central Transantarctic Mountains, Antarctica

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Strata at Wahl Glacier, Lamping Peak, and Wyckoff Glacier in the Beardmore Glacier region of the central Transantarctic Mountains, Antarctica were deposited in a tectonically active retroarc foreland basin during the Late Permian and Early Triassic. A change in fluvial style occurs across the Permian-Triassic boundary from Upper Permian strata containing individual sandstone bodies encased in fine grained flood-plain facies to Lower Triassic strata containing amalgamated, medium-to coarse-grained, channel-form sandstone bodies with sparse flood-plain deposits. This change in stacking pattern is interpreted to be result of multiple orogenic loading events and associated basin subsidence alternating with erosion of the load and progradation of clastic wedges into the basin during tectonic quiescence.

Strata are broken into three packages: the lower Buckley, upper Buckley, and Lower Fremouw Formations. Strata in the lower and upper Buckley Formation were deposited in braided streams with water-saturated flood-plains containing peat bogs, shallow lakes, and forests. Strata in the Lower Fremouw Formation were deposited by braided systems with well-drained flood plains and sparse vegetation.

Paleocurrents within basal volcanoclastic sandstones at Wahl Glacier indicate that these strata are part of the lower Buckley Formation. Paleocurrents in the upper Buckley Formation indicate deposition along the basin axis during the Late Permian, with a component of flow coming from the direction of the hypothetical orogenic belt. A modal analysis of Lower Triassic sandstones demonstrates that the region was influenced by sediment coming off of the Antarctic craton at that time. Paleoflow suggests that these sandstones were deposited near the basin's longitudinal drainage axis. The discovery of a transitional sandstone immediately below the Permian-Triassic boundary reinforces the influence of active tectonism on the sequence.

A change in sandstone petrology and shifting Permian and Triassic lithofacies patterns suggest that changes in fluvial style across the Permian-Triassic boundary resulted from tectonic activity associated with development and evolution of the retroarc foreland basin. No conclusive evidence for gradual climate change or a catastrophic event during the Permian-Triassic transition was found.