## PROVENANCE, SEDIMENTATION, AND DEFORMATION ASSOCIATED WITH A MID-CENOZOIC HIATUS IN THE ANDEAN FORELAND BASIN, WEST-CENTRAL

## ARGENTINA

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## ABSTRACT

The northern Neuquén Basin of Argentina contains important structural and stratigraphic records of Cenozoic Andean deformation and nonmarine clastic sedimentation. Debate surrounds a ~40-20 Ma hiatus that marks a significant shift in foreland basin evolution in terms of sediment accumulation, paleodrainage, and provenance. To test hypotheses for the observed stratigraphic shift and ~20 Myr hiatus, we measured detailed stratigraphic sections in conjunction with detrital zircon U-Pb geochronological analyses for the Cerro Butaló and Agua Botada localities at 35.8°S. Stratigraphic and sedimentologic analyses of a ~1100 m thick Cenozoic succession reveal a highly condensed section (<10 m thick Rodados Lustrosos unit) distinguished by very well rounded, highly polished cobbles that sustained major wind-blown abrasion. These unique clasts commonly include faceted surfaces diagnostic of ventifacts and are interpreted to have endured significant physical weathering and eolian abrasion. Mid-Cenozoic eolian ablation coincided with little to no deposition over a >500 km strike length of the Andean foreland basin. Detrital zircon U-Pb age signatures record similar sediment sources directly before and after the hiatus, with derivation primarily from the Andean magmatic arc. This pattern attests to a uniform bulk rock composition of Andean topography, consistent with limited exhumation and landscape stasis during a ~20 Myr pause in major shortening. However, an early Miocene provenance shift from exclusively Andean magmatic arc to high-diversity age groups suggest exposure of multiple sources across the growing fold-thrust belt. This flourishing of sediment sources and associated shifts in paleocurrents suggest major drainage reorganization and landscape change consistent with intensified shortening in the fold-thrust belt. Thrust-related growth strata within coarse-grained fluvial to alluvial fan deposits of Miocene Agua de la Piedra and Loma Fiera Formations indicate latest Miocene (~8-7 Ma) advance of the Andean deformation front and flexural subsidence. These findings point to principally tectonic influences on basin evolution, with the stratigraphic hiatus reflecting an important mid-Cenozoic pause in Andean shortening and tectonic subsidence.

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