



## **Paleogeography and Depositional Systems of Cretaceous-Oligocene Strata: Eastern Precordillera, Argentina**

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New data from the Argentine Precordillera in the southern Central Andes document changes in depositional environment and sediment accumulation rates during Upper Cretaceous through Oligocene basin evolution, prior to the onset Miocene foredeep sedimentation. This work presents new sedimentology, detrital geochronology, and geologic mapping from a series of continental strata within this interval to resolve the timing of sedimentation, nature of depositional environments, and basin paleogeography at the nascent phase of Andean orogenic events, prior to the uplift and deformation of the Precordillera to the west. Five stratigraphic sections were measured across both limbs of the Huaco Anticline, detailing sedimentology of the terrestrial siliciclastic upper Patquía, Ciénaga del Río Huaco (CRH), Puesto la Flecha, Vallecito, and lower Cerro Morado formations. Paleocurrent data indicate a flow direction change from predominantly NE-SW in the upper Patquía and the lower CRH to SW-NE directed flow in the upper CRH, consistent with a large meandering river system and a potential rise in topography towards the west. This interpretation is further supported by pebble lag intervals and 1-3 meter scale trough cross-bedding in the CRH. The thinly laminated gypsum deposits and siltstones of the younger Puesto la Flecha Formation indicate an upsection transition into overbank and lacustrine sedimentation during semi-arid climatic conditions, before the onset of aeolian dune formation. New maximum depositional age results from detrital zircon U-Pb analysis indicate that the Puesto la Flecha Formation spans  $\sim 57$  Myr ( $\sim 92$  to  $\sim 35$  Ma) across a  $\sim 48$  m thick interval without evidence for major erosion, indicating very low sedimentation rates. This time interval may represent distal foredeep or forebulge migration resultant from western lithospheric loading due to the onset of Andean deformation at this latitude. Detrital zircon U-Pb age spectra also indicate shifts in sediment routing pathways over time, consistent with a transition from local basement-sourced quartz-rich sediments during the Triassic-Cretaceous to increased volcanic and sedimentary lithics from the rising Andes in the west during Paleocene-Eocene time. We therefore interpret these changes in depositional character as representing a transition from a large fluvial system with craton-sourced sediments during the Triassic-Cretaceous CRH to low energy lacustrine and ephemeral playa environments with an increase in westerly derived sediments during the Paleocene-Eocene Puesto la Flecha, prior to the reported Oligocene onset of the Andean continental foredeep represented by the Vallecito Formation.