

Reconstructing Streamflow to Nowhere: Long-term Variability of Flow Into the San Luis Valley Closed Basin, Colorado, USA

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Abstract. The San Luis Valley in southern Colorado, USA is a unique region of high desert surrounded by the snow-capped San Juan and Sangre de Cristo Mountains. Historically, the northern and southern portions of the basin were hydrologically distinct with the headwaters of the Rio Grande River flowing across the southern portion while snowmelt-fed streams in the northern portion flowed into extensive wetlands and playa lakes before disappearing into the valley floor. Modern pumping from the endorheic part of the valley into the Rio Grande has connected the two areas, but residents of the northern part of the valley still rely on meltwater streams off the west flank of the Sangre de Cristo Mountains to recharge the deep alluvial aquifer of the closed basin for domestic and agricultural consumption and to sustain the riparian corridors and wetlands important to wildlife. This work attempts to characterize long-term water availability to this area using tree-rings as a proxy for streamflow prior to instrumented records. Regression analysis of modern climate and paleoclimate datasets from the National Oceanic and Atmospheric Administration will be used with streamflow data for Crestone Creek from the Colorado Division of Water Resources to reconstruct flow. The results of this analysis will be compared to existing tree-ring based reconstructions of flow for the Rio Grande and several of its tributaries in the San Luis Valley.

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