Title: **Impacts of streambed dynamics on nutrient and fine sediment transport in mountain rivers**

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Project Abstract: In mountainous watersheds, rivers typically have an armor layer of coarse sediment that protects the finer subsurface from erosion. In theory, armor layer motion during high magnitude flows could release the subsurface fine sediments that are often enriched in Phosphorus (P) and Particulate Organic Carbon (POC). Hysteresis and seasonal variations in POC, soluble reactive phosphorus (SRP), particulate phosphorus (PP), and suspended sediment (SS) may therefore be partly controlled by armor layer motion. In addition, streambed concentrations of these constituents may depend on whether a reach is losing or gaining. We are currently testing whether armor layer motion and streambed concentrations influence hysteresis patterns during summer monsoon and snowmelt seasons in one gaining and one losing reach of La Jara Creek in Valles Caldera National Preserve, NM. We are measuring armor layer motion, streambed and river concentrations of POC, PP, SRP, and fine sediment as well as surface and groundwater exchange in these two reaches. In addition, we are conducting field experiments that isolate the effects of armor layer removal on nutrient and fine sediment concentrations in the water column. Preliminary results demonstrate generally similar hysteresis patterns of PP, SRP and fine sediment in one monsoon driven event that moved the armor layer. The final results of this work will determine how perturbations, such as the sequence and magnitude of droughts and floods, constrain biogeochemical nutrient cycling and impact subsequent temporal variations in nutrient and fine sediment export from mountainous watersheds.