



## Sorting Patterns in Curved Channels: Flume Experiment Observations

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**Abstract.** Meandering rivers tend to exhibit bed surface sorting patterns with coarse particles located in pools and fine particles located on bar tops. The mechanism by which this pattern emerges, particularly in gravel-bed rivers, remains poorly understood. Here we present results from an ongoing flume experiment performed at the Colorado State University Hydraulics Laboratory in which channel bed morphology, flow velocity, sediment particle sorting patterns, and bedload transport are being precisely documented in a single bend meandering channel with mixed particle-size gravel. The experimental channel is 1.35 m wide, 15.2 m long, and its centerline follows a sine-generated curve with a crossing angle of 20 degrees. Water and sediment input were held constant throughout the experiment at 104.8 L/s and 230 kg/h, respectively, and measurements are collected under quasi-equilibrium conditions once the sediment input and output were approximately equal and the bed was essentially unchanging. The velocity data will be analyzed to evaluate the development of secondary circulation patterns, and bedload transport data will be analyzed to quantify how sediment transport is partitioned into downstream and cross-stream components, and how these components demonstrate partial or selective mobility. Ultimately, an improved understanding of the relationship between flow and sediment transport in meandering gravel bed channels can enhance stream channel design and habitat restoration.