

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Geomorphic Response of Roaring River and Fall River to the September 2013 Flood

Discipline: Natural Resources
Type of Project: Technical Assistance
Funding Agency: National Park Service
Other Partners/Cooperators: University of Colorado at Boulder
Effective Dates: 5/1/2014 - 12/31/2015
Funding Amount: \$67,419

Investigators and Agency Representative:

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Project Abstract: The September, 2013 flood appears to have triggered widespread erosion and instability of pre-existing glacial deposits along the Roaring River valley, resulting in a heavy supply of sediment to the alluvial fan and subsequent damage to the Old Fall River Road. At this location, Roaring River has shifted ~100 m to the west and a large amount of sand- and gravel-sized sediment has been deposited in the area where Fan Lake once existed. It is likely that these new deposits will be reworked during the coming spring runoff, and thus greatly increase the sediment supply to Fall River. One near-term concern with increased sediment supply to Fall River is the potential to overload the channel, and force a transition to a braided-like pattern, similar to what Pitlick (1993) observed in lower Horseshoe Park following the Lawn Lake flood, and what Rathburn et al. (2013) observed in the headwaters of the Colorado River following the Grand Ditch failure. Whether this does or does not occur depends strongly on the mobility of the sediment transported off the Roaring River alluvial fan. A second, longer-term concern is with continued instability along Roaring River, and the likelihood that above-average floods or debris flows will transport additional coarse sediment to the head of the fan, and cause yet another shift in channel position.

Understanding the causes and geomorphic consequences of increased sediment supply is an area of active research in fluvial geomorphology (Hoffman and Gabet, 2007; Andrews and Antweiler, 2012; Rathburn et al., 2013; Mueller and Pitlick, 2013; Tullos and Wang, 2014). In a practical sense, a better understanding of sediment transport processes can also help inform specialists in resource management about the potential impacts of high sediment supply on Park resources and infrastructure, and ways to increase public safety in areas that have been heavily impacted.

Outcomes with Completion Dates: Final Technical Report - 10/31/2015

Keywords: flood geomorphology, Roaring River, Fall River, Rocky Mountain National Park, University of Colorado at Boulder