

## **Post-Fire Erosion Response and Recovery, High Park Fire, Colorado**

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**Abstract.** In June 2012 the High Park Fire burned 35,400 ha west of Fort Collins, Colorado. The burned area encompassed a wide range of severities and coniferous forest types. Our objective is to document how post-fire erosion rates vary with rainfall characteristics, surface cover, and physical hillslope characteristics. We installed twenty-nine sediment fences and eight tipping bucket rain gages in summer 2012 and spring 2013 in areas burned at moderate to high severity. Eight sites were mulched with wood and/or straw after the study commenced. Contributing areas for the sediment fences range from 0.08-1.58 ha, slope lengths from 50-350 m, and slope angles from 8-57%. Soils are loamy sands and sandy loams. The HPF area received 55% of average summer rainfall in 2012, and 157% of average summer rainfall in 2013. In 2012, storms that exceeded a total depth of 4 mm, maximum 30-minute intensity (MI30) of 3.6 mm/hr, and erosivity (EI30) of 3.2 MJ\*mm/ha\*hr produced sediment. In 2013 those thresholds increased to 7.8 mm depth, 8.1 mm/hr MI30, and 22.2 MJ\*mm/ha\*hr EI30. Precipitation thresholds for sediment production at the mulched sites were higher at 9.9 mm depth, 8.1 mm/hr MI30 and 39.5 MJ\*mm/ha\*hr EI30 for both years. Bare soil decreased from an average of 57% of surface cover in fall 2012 to 41% in fall 2013, while vegetation increased from 3% to 27%. Sediment yield from the un-mulched study sites ranged from 0.0-24.2 Mg/ha in 2012 to 1.9-38.6 Mg/ha in 2013. Sediment yield from mulched sites ranged from 0.05-8.9 Mg/ha in 2013. Preliminary results indicate the MI30 is the strongest predictor of sediment yield (R-squared 0.45), followed by percent sand (R-squared 0.28), slope angle (R-squared 0.28), and slope length (R-squared 0.18).