



Hydrologic Effects of Wildfire at a Range of Spatial Scales

Charles Luce
US Forest Service Research, Boise, United States (cluce@fs.fed.us)

Wildfire alters hydrologic and geomorphic processes through a variety of mechanisms ranging from water repellency to vegetation changes. These different processes interact to affect aquatic ecology and water supply in larger basins. The relative importance of these processes to flood risk, water supply, and aquatic ecology changes as the extent of the analysis area increases. At scales from hillslopes to small catchment, the spatial distribution of water repellency is a critical factor in flood generation. At scales covering many such catchments within an individual fire, the occurrence of debris flows and disruption of aquatic habitat is controlled by spatial distribution of storms within a short time window following fire. Within basins of a few thousand sq. km, flood changes may be hydro-metrically insignificant, while annual scale water yields increase. This presentation summarizes results of studies ranging from hillslope to basin scale in the intermountain western United States to show how the nature and scaling of hydrologic and geomorphic effects changes across broad scales.