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**Updated Abstract**

This study investigated the relationship between the vegetation regrowth process and flooding following wildfire events in Arizona within the Lower Colorado River Basin. Extensive studies have been conducted on post-burnout rainfall-run-off relationships or post-burnout vegetation regeneration, but few establish a relationship between both processes. In this study, MODIS-NDVI Earth observations were first used to create a surface indicating vegetation regrowth rate on a per-pixel basis following historical wildfire events. Next, historical flood events were identified in the NOAA PERSIANN precipitation Climate Data Records to establish return intervals associated with increased post-wildfire flooding risk. The relationships between recurrence intervals, time since the fire, burn severity, vegetation regrowth, and elevation were then used to enhance the post-fire warning systems of local management. By utilizing remotely-sensed vegetation and precipitation data in a study area with limited *in situ* data, this analysis provides an additional long-term predictive tool for managing future post-fire hazards.