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## Temporal Variation Characteristics of Soil After Fire in A Post-fire Debris Flow Source Area

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The influence of forest fire on soil hydrology and mechanical effects promotes the occurrence of post-fire debris flow. However, the variation of soil properties with time has not been much studied. In order to determine the temporal variation characteristics of soil hydrology and mechanical effects after forest fires under different fire severities, and link them to the initiation of post-fire debris flows, a two-year continuous testing of samples from the source area of post-fire debris flows in Muli County, China, were investigated. Saturated direct shear test, saturated permeability experiment and scanning electron microscope experiments of undisturbed soil were carried out. The results showed that the burning of organic matter occurred, which reduced soil permeability sharply. In addition, high temperatures destroyed the structure of soil, causing the internal collapse of aggregates and reducing soil shear strength. While the herbaceous plants can quickly regenerate after fire, improving the hydrological and mechanical properties of soil, and reducing the frequency of post-fire debris flow. These results can evaluate the changes of soil physical and mechanical properties in short term after fire, and also explain the formation mechanism of post-fire debris flow.