

## Understanding the Effects of Wildfire on Soil Moisture Dynamics, Plant Water Uptake, and Recharge Using Electrical Resistivity

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Moisture dynamics in the *critical zone* have significant implications for a variety of hydrologic processes, from how much water is available to plants to infiltration and groundwater recharge rates. These processes are perturbed by events such as wildfires which may have long-lasting impacts. In September 2011, the most destructive wildfire in Texas history occurred in and around Bastrop State Park, which was significantly affected; thus we take advantage of a rare opportunity to study soil moisture under such burned conditions. A 165 m long transect bridging burned and unburned areas was established within the “Lost Pines” of the park. Soil moisture and soil temperature are being monitored using a variety of methods, including 2D electrical resistivity imaging (using Dipole-dipole and Schlumberger configurations), handheld measurements using a Theta probe, readings at depth using PR2 Profile probes, and installation of thermistors. Preliminary data indicate greater soil moisture near the surface at the burned end of the transect, where trees have been largely killed by the fire and grasses now dominate, and very low near-surface soil moisture at the opposite end, which is still populated by pine trees and exhibits considerably lower soil moisture readings and higher resistivity. Field measurements will continue to be collected at approximately one-month intervals to further study temporal and seasonal effects on soil moisture and temperature in this area.

**Keywords:** Electrical resistivity, soil moisture, vadose zone, wildfire