



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** NV4182

**Title:** A Method to Determine the Effects of Fire, Restoration, and Invasive Species on Local and Regional Hydrology in the Great Basin by the Use of Environmental Tracers

**Focus Categories:** Hydrology, Methods

**Keywords:** fire, hydrology, geochemistry, isotopes, recharge

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**Congressional District:** Nevada 02

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**Abstract**

A combination of periodic fire and the introduction of aggressive, non-native plant species has significantly altered the landscape of the Great Basin and may have affected significant changes in the soil moisture dynamics and hydrology of the region. Shallow-rooted annual grasses (cheatgrass) and deeper-rooted perennial grasses (crested wheatgrass) have replaced native plant communities dominated by deep-rooted perennial shrub and tree species. While the changes in plant community composition have received considerable attention, the accompanying alterations in hydrology in the Great Basin have not been thoroughly investigated. The demands placed on soil moisture and the timing of those demands by the introduced species may change (increase) the quantity of water available for recharge.

The clear delineation between burned and unburned areas at the edges of a fire offer excellent opportunity to evaluate the hydrologic effects of fire and plant succession. At fire lines, treatment (burned) and control (unburned) are in close proximity and can be clearly identified. We propose a field effort that will use environmental tracer methods to evaluate changes in hydrology resulting from fire and subsequent (re-)establishment of a plant community. Environmental tracer analysis of soil samples from soil coring activities at a burn site will provide a longer-term view of changes in soil moisture status, especially recharge, associated with burned areas.