



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2003MT9B

**Title:** Topography, groundwater dynamics, and soil frost: First-order controls on snowmelt runoff dynamics and plant species distributions across an upland–wetland transition

**Project Type:** Research

**Focus Categories:** Hydrology, Wetlands, Groundwater

**Keywords:** hydrology, topography, soil frost, wetlands, runoff, flowpaths

**Start Date:** 05/01/2003

**End Date:** 02/28/2005

**Federal Funds:** \$14576.00

**Matching Funds:** \$ 29927.00

**Congressional District:** At-large

**Principal Investigators:** McGlynn, Brian; Sojda, Richard

**Abstract:** The interrelationship between hydrology, topography, frost depth, and the distribution of wetland plant species is poorly understood. We seek to elucidate the first-order controls on snowmelt flow pathways, frost depth, and plant species distributions across an upland–wetland transition as a first step toward conceptual model development and investigation of snowmelt flowpaths and hydro-ecologic dynamics at the landscape scale. The transition zone between uplands and wetlands or riparian zones is a key landscape zone due to dynamic groundwater levels and vegetation. We propose to investigate the controls on frost depth and its relationship to hydrologic flowpaths during snowmelt, the partitioning of old and new water in runoff, and soil moisture/groundwater recharge. In addition, we propose to investigate the variables controlling plant species distribution across an upland to wetland transition. We have observed six to eight plant species zones from the upland grassland to the wetland complex. The hydrological dynamics and plant species distributions appear tightly linked at Red Rocks Lake and in the Centennial Valley, making this an ideal site for new investigation in the emerging field of hydro-ecology.

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