

## **An Ecohydrological Paradox: Why is it so hard to manage vegetation to increase water supplies: Examples from the Southern Great Plains**

Vegetation has a fundamental and profound impact on the hydrological cycle. This is a core tenant of the emerging scientific discipline of ecohydrology. Human activities through deforestation, afforestation, agriculture and myriad other activities have significantly modified vegetation cover which in turn has led to unintentional yet measurable and important changes in ground water recharge and streamflows. At the same time, we have been largely unsuccessful at intentionally increasing water supply through vegetation modification including timber harvesting and brush control. In this presentation I describe this *ecohydrological paradox* using examples from the Southern Great Plains which has been extensively modified in the last century because of the expansion of savannas and woodlands at the expense of grasslands. This change has occurred largely because fire regimes have been significantly altered with the European settlers. There has been a long and costly “war on shrubs” in the region to little avail with respect to the area now covered by woodlands. The expansion of woody plants in the region has resulted in large scale modification of streamflow regimes but in unexpected ways. Although there are large and expensive brush control programs funded at the State and Federal level that are justified as means for increasing water supply, our research demonstrates that these programs do not accomplish the stated water supply goals.