Public Abstract
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Water samples from ephemeral streams and associated hillsides werer collected to quantitatively determine the impact of Regenerative Oak Clear Cutting (ROCC) on water quality and sediment and nutrient transport in ephemeral channels in the Missouri Ozarks. The concept of a threshold event is introduced and defined as the amount of precipitation necessary under a specific set of environmental conditions to create collectable flow in the ephemeral channels. Precipitation and antecedent soil moisture were monitored and found to have the most significant influence on the amount of runoff. A model was developed relating precipitation and soil moisture to the number of water samples collected following each recorded precipitation event. An automatic flow monitoring and water sampling unit was installed to collect water samples and measure the flow response of a forested ephemeral watershed. Stream gauge and discharge hydrographs were recorded for one ephemeral channel during two significant flow events and a water balance performed on an ephemeral drainage basin revealed approximately 20% of moisture exits as channel flow. Performance of all equipment is evaluated. Over 200 pieces of equipment have collected nearly 360 channel water samples and over 210 hillslope water and sediment samples. Although performing well overall, equipment has been prone to damage from wildlife and environmental factors. Work for this thesis was performed between May 2005 and August 2006.