Geophysical Research Abstracts
Vol. 12, EGU2010-13364, 2010
EGU General Assembly 2010

Evaluating channel morphology in small watersheds of oak savannas Southeastern New Mexico, USA: Do seasonal prescribed burn treatments have a significant impact on sediment processes?

Karen Koestner (1), Daniel Neary (1), Gerald Gottfried (2), and Aregai Tecle (3)

(1) US Forest Service, Rocky Mountain Research Station, Flagstaff, Arizona, USA (dneary@fs.fed.us, +01-928-556-2130), (2) US Forest Service, Rocky Mountain Research Station, Phoenix, Arizona, USA (ggottfried@fs.fed.us), (3) Northern Arizona University, Flagstaff, Arizona, USA

Oak-savannas comprise over 80,000 km2 of the southwestern United States and northern Mexico. However, there is a paucity of data to assist in the management of this vast ecotype. Fire, which was once the most important natural disturbance in this system, has been excluded due to over-grazing and fire suppression practices. This has resulted in ecosystem changes and fuel accumulations. Prescribed fire is one management technique to restore natural processes within southwestern oak-savannas by reducing woody species density, increasing herbaceous plant production, and creating vegetative mosaics on the landscape. However, questions concerning the seasonality of burn treatments and the overall effects of these treatments on physical and ecological processes need to be addressed prior to broad management application. The Cascabel Watershed Study is a collaborative effort between multiple government agencies, universities, local land managers, and environmental interest groups to evaluate the impacts of warm and cool season burn treatments on an array of ecosystem processes. Established in 2000, the Cascabel Watershed study takes an “ecosystem approach” to watershed research by examining an array of physical and biological components, including geomorphologic, climatologic, hydrologic, and biologic (flora and fauna) data to determine ecosystem response to prescribed fire. The 182.6 ha study area is located in the eastern Peloncillo Mountains, New Mexico at about the 1,640 m elevation. It consists of 12 small watersheds dominated by an oak (Quercus spp.) overstory and bunch-grass (Bouteloua spp.), savanna component. The parent material is fine-grained Tertiary rhyolite that is part of an extensive lava field that was formed about 25 to 27 M ybp. A US Forest Service soil survey in the area classified 45% of the soils as Typic Haplustolls, coarse-loamy, mixed, mesic, 25% as Typic Haplustalfs, and 15% rock outcrops. Here, we evaluate within-channel processes to establish baseline denudation rates and sediment production estimates, and to determine whether or not either of the burn treatments applied has a significant effect on channel morphology. Initial results indicate that burn treatments have not had a discernable impact on basin morphology across the 12 watersheds. These data assist land managers in making informed decisions regarding prescribed burn treatments.