Geophysical Research Abstracts
Vol. 12, EGU2010-7696, 2010
EGU General Assembly 2010

Influence of Soil Water Repellency on Infiltration into Fine- to Coarse-Textured Soils of Burned and Unburned Rangeland Ecosystems in the Great Basin, USA

Fred Pierson (1), Pete Robichaud (2), Jason Williams (3), Patrick Kormos (4), and Osama Al-Hamdan (5)

(1) USDA-Agricultural Research Service, Northwest Watershed Research Center, Boise, Idaho, United States (fred.pierson@ars.usda.gov, +208 422 0720), (2) USDA-Forest Service, Rocky Mountain Research Station, Moscow, Idaho, United States (probichaud@fs.fed.gov, +208 883 2349), (3) USDA-Agricultural Research Service, Northwest Watershed Research Center, Boise, Idaho, United States (jason.williams@ars.usda.gov, +208 422 0708), (4) Boise State University, Department of Geosciences, Boise, Idaho, United States (patrickkormos@u.boisestate.edu), (5) University of Idaho, Northwest Watershed Research Center, Boise, Idaho, United States (osama.al-hamdan@ars.usda.gov, +208 422 0700)

Soil water repellency and its spatial and temporal variability have been documented for a range of soil types and plant communities. The magnitude of its influence on infiltration of rainfall however remains uncertain, particularly for rangeland landscapes in the western United States. Very little is known about how to include this important hydrologic variable, and its influence on infiltration, runoff, and erosion, into rangeland hydrology models. We have investigated the presence and hydrologic relevance of soil water repellency on fine- to coarse-textured soils of shrub steppe and conifer rangeland communities across the western United States. We have consistently observed naturally occurring strong soil water repellency within these ecosystems pre- and post-fire. Furthermore, we have repeatedly found soil water repellency to be reduced following wildfire and prescribed-fire. Our research has demonstrated that soil water repellency within western rangeland landscapes exhibits dramatic year-to-year variability in strength and occurrence and that the temporal variability can exert a greater influence on runoff and erosional responses than disturbances such as fire. We present our results from several published and unpublished studies that illustrate these relationships and suggest the importance of considering soil water repellency in development of rangeland hydrology models.