Rangeland Hydrology and Erosion Model (RHEM) Workshop

Organized by the United States Department of Agriculture’s Agricultural Research Service (ARS)

Overview

This ½ day workshop on Sunday, July 17 is designed to provide workshop participants background on dominant hydrologic and erosion process on rangelands, equations implemented in RHEM, and how to access and interpret model predictions using examples from across the United States for different ecological and climatic conditions. The RHEM tool has been designed to investigate the hydrologic-soil erosion impacts of land-cover/land-use change. RHEM uses an intuitive interface, requiring relatively little hydrologic expertise to identify areas that are more susceptible to land use impacts and evaluate different management scenarios or alternative futures. During the workshop users will be shown how to use RHEM to conduct national estimates of soil erosion, assess the benefits of conservation, and defining the hydrologic impact of changing from one ecological state to another using the concept of state-and-transition models.

Predicting soil erosion is a common practice in rangeland management for assessing the effects of management practices impacts on sustainability and soil health. RHEM is a newly conceptualized model that was specifically designed to address rangelands conditions for estimating runoff, erosion, and sediment delivery rates and volumes at the spatial scale of the hillslope and the temporal scale of a single rainfall event. RHEM
links the model’s hydrologic and erosion parameters with rangeland plant community by providing a new system of parameter estimation equations based on diverse rangeland datasets through a simple web-enabled interface. Model inputs are surface soil texture, slope length, slope steepness, slope shape, dominant plant life form, percentage of canopy cover, and percentage of ground cover by component. Climate (precipitation intensity, duration, and frequency) is estimated for sites within the United States with the CLIGEN stochastic weather generator. RHEM uses this information to estimate the average annual soil loss during a 300-year time span and to estimate the vulnerability of a site to soil erosion based on the risk of experiencing a runoff event with a given magnitude (e.g., 10-, 25-, or 50-year return period storm events). RHEM model inputs and outputs are displayed in tabular and graphical form and multiple runs can be compared to assess how changes in cover characteristics from management practices will influence runoff, soil erosion and sediment yield.

Participants will need to bring a windows based laptop to run the model during the workshop.

If the you want to become familiar with the model and background science before the workshop the RHEM model can be accessed at: http://dss.tucson.ars.ag.gov/rhem/. RHEM scientific publications can be accessed at: http://apps.tucson.ars.ag.gov/rhem/docs.
Agenda
USDA-ARS Workshop on RHEM (Rangeland Hydrology and Erosion Model)

Sunday, July 17, 2016
8:30 am - 12 noon

Gallery Suites, TCU Place, Saskatoon, SK

Presenters/Organizers: Mark Weltz, Jason Nesbit, Kossi Nouwapko, Jason Williams, Mark Nearing and Ken Spaeth

Attendees are encouraged to bring their own laptop.

Introduction on the background and intended use of the Rangeland Hydrology and Erosion Model

Driving scientific equations in the model

Introduction to the web enabled model interface

Example using Sonoran Desert creosotebush plant community

Example using Texas post-oak savanna woodland

Interpretations and use of the model output