Pima County Regional Flood District Monthly Brown Bag Series

Walnut Gulch Experimental Watershed – southeastern Arizona

The dynamics of the uncertainty and parameter sensitivity in modeling semi-arid systems

Menberu Meles
USDA-ARS
Southwest Watershed Research Center

The dynamics of parameter importance in earth systems modeling framework has been the focus of research in recent years. To investigate the changing aspects of parameter importance, we implemented the variogram analysis of response surfaces to characterize the predictive uncertainty of the KINEROS2 physically-based distributed hydrologic model in the USDA-ARS Walnut Gulch Experimental Watershed (WGEW). Parameter importance was assessed using the absolute and relative sensitivity indices for several time-variant (throughout the simulation period) and time-aggregate (average of a simulation) response surfaces that represent the needs and objectives of modeling exercises. The results showed the importance of the parameters varied considerably depending on the type of the model responses of interest, size of watersheds, the depth and intensity of rainfall, the rainfall distribution, and the location of the storm from the watershed outlet. Identification of the most sensitive parameters and the factors that influence them was useful for a comprehensive understanding of process-based models, the uncertainties in model predictions, and to design systematic parametrization procedures in modeling semiarid systems.

PIMA COUNTY
FLOOD CONTROL

Wednesday, May 13, 2020: 12:00 - 1:00 PM
Online via Teams