



ABSTRACT



44-2: Integration of Distributed Measurements and Simulations to Explore Spatial Complexity in a Field-Scale Agricultural Watershed.

Monday, January 07, 2019

01:45 PM - 02:00 PM

Sheraton San Diego Hotel (Marina Tower) - Marina 6

Long-term measurements of high-resolution soil moisture across rolling terrain facilitate complex simulations of surface hydrology and soil moisture dynamics. Soil hydraulic properties that control water storage flow rates can vary markedly in space, and surface layers may vary temporally due to management events, reconsolidation and biological activity. Field measurements are expensive to collect and generally reveal complex variability that is difficult to fully characterize. Yet, these soil properties are represented using model parameters that may strongly affect simulated flows and the distribution of soil water in space and time. Thus model calibration using available measurements of soil moisture and surface runoff is essential. Here, we address the model spatial resolution and calibration detail needed to estimate available data by using five levels of spatial complexity from homogeneous to fully three-dimensional calibrated soil parameters. Issues of spatial scaling are also explored. Furthermore, a new model component of temporal changes in soil porosity and saturated hydraulic conductivity is tested to simulate effects of tillage and soil consolidation related to rainfall. Interactions between spatial and temporal parameters and processes will be discussed in terms of their influences on simulated soil moisture patterns and surface runoff.

Authors

[Timothy R. Green](#)

[Robert H. Erskine](#)

[Holm Kipka](#)

[Nathan Lighthart](#)

[Debora A Edmunds](#)

[Gregory S. McMaster](#)

[Olaf David](#)

[Patricia Porta Nova
Cruz](#)

[Ricardo de Oliveira
Figueiredo](#)

[Find Similar](#)

View Related Events

Day: [Monday, January 07, 2019](#)