3-D Simulations of Heat and Water Flow in Landscapes with Heterogeneous Soils. (S05-molling113036-Oral)

Authors:

- C.C.Molling - *University of Wisconsin - Madison*
- J.M.Norman - *University of Wisconsin - Madison*

Abstract:

The Precision Agricultural Landscape Modeling System (PALMS) is a biophysical process model simulating physical processes and plant growth on heterogeneous landscapes. Point-column processes are simulated on 5x5 to 20x20 meter grid cells. These processes include heat, water, and CO_2 exchange from the free atmosphere, through plant canopy, to the surface; above and below ground plant physiology; and distribution of energy, water, and nutrients in the soil down to 5.5 meters. Processes on individual grid cells are connected through overland flow of water that includes effects of soil roughness and tillage interactions with topography. Results from several PALMS simulations will be shown in graphical form, primarily water movement on the landscape surface, and the movement of heat and water in the soil. Results will emphasize the interactions among topography, soil heterogeneity, and management (tillage type and timing). Widespread use of PALMS will depend strongly on meaningful and easily approachable methods of visualizing model output. A few examples of the problems of visualizing 3D data are discussed and ideas regarding creative solutions are presented.

Corresponding Author Information:

Christine Molling
University of Wisconsin - Madison
1225 West Dayton St
Madison, WI 53706-1612

phone: 608-265-5350
fax: 608-262-5974
e-mail: cmolling@facstaff.wisc.edu

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