Geophysical Research Abstracts
Vol. 16, EGU2014-5978, 2014
EGU General Assembly 2014

Quantifying the effect of model scales with the inclusion of groundwater on simulated surface-energy fluxes.

Prabhakar Shrestha (1), Mauro Sulis (1), Stefan Kollet (2,3), and Clemens Simmer (1)

(1) Meteorology Institute, Bonn University, Bonn, Germany , (2) Institute of Bio- and Geosciences, Agrosphere (IBG-3), Research Centre Juelich, Germany, (3) Centre for High-Performance Scientific Computing in Terrestrial Systems, ABC/J Geoverbund, Germany

Soil moisture is a key variable that affects the partitioning of surface energy fluxes. Spatial-temporal variability of soil moisture is dependent on: 1) Variability of meteorological conditions and precipitation events, and 2) Spatial heterogeneity of land-usage, geology and topography. For numerical models, heterogeneity is a deterministic source of variability related to model scales (grid cell size) of the numerical domain. Modeling scales becomes important as one moves from column models (related to modeling vertical fluxes) to physically based models with integrated surface-groundwater flows, adding a new dimension of spatial complexity. This study tries to examine how the model scales effect the soil moisture variability and surface-energy fluxes with the inclusion of a ground water model. We use the hydrological component of the newly developed Terrestrial System Modeling Platform (TerrSysMP) over Rur catchment in Germany. The hydrological component of TerrrSysMP consists of NCAR Community Land Model (CLM) coupled with 3D variably saturated ground water model ParFlow. Results are presented based on the yearly simulations at multiple modeling scales (960m, 480m, 240m and 120m).