MODELING OF SURFACE-SUBSURFACE COUPLED PROBLEMS ACROSS TEMPORAL AND SPATIAL SCALES

E. BACHINI[1], M. W. FARTHING[2], R. M. MAXWELL[3] AND M. PUTTI[4]

[1] Department of Mathematics "Tullio Levi-Civita", University of Padua, Italy
elena.bachini@unipd.it

[2] U.S. Army Corps of Engineers, Vicksburg (MS), USA
Matthew.W.Farthing@erdc.dren.mil

[3] Department of Civil and Environmental Engineering, Princeton University, USA
reedmaxwell@princeton.edu

[4] Department of Agronomy, Food, Natural resources, Animals and Environment, University of Padua, Italy
mario.putti@unipd.it

ABSTRACT

The interactions of groundwater dynamics, overland flow and land surface processes has gained recent attention in hydrologic sciences. Over the past several years, owing also to updated numerical and computational technologies, new approaches for modeling these coupled interactions have been developed. As research is addressing these issues from a range of scale and process description, it is now important to exchange information on the new techniques and to understand feedback of these coupled processes across the hydrologic cycle.

The aim of this session is to cover state of the art mathematical and computational frameworks, including high-performance computing and software development, and applications for coupling groundwater and surface water models over a wide range of time and spatial scales. Contributions are invited on theoretical, numerical, and experimental studies that address all components of the water cycles. Emphasis is placed on the coupling of the different processes of the surface-subsurface-land system, including the mediating role of vegetation. Topics of interest include watershed dynamics, feedback on evapotranspiration, infiltration and runoff, representation of soil/vegetation types, atmospheric forcing, and precipitation processes, among others.