**Flow and Transport in Agricultural Ecosystems and the Natural Environment:**

**Advances and Applications in Soil, Water, Energy and Food Systems**

by

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**Abstract**

Understanding flow and transport processes in the natural environment and agroecosystems is critical for the sustainable exploitation and management of natural resources —soil, water, and forests, the development of effective remediation procedures, and the protection of the human and ecosystem health. This presentation will discuss several advances and applications in soil, water, energy and food systems related to: 1) Fate and transport of nanoparticles in soil-water-plant systems; 2) Fate and transport of the zoonotic pathogen – *Cryptosporidium parvum* – in soils; 3) Impacts of hydrological processes and biochemical compounds from plants and microbes on the fate and transport of uranium in the vadose zone; 4) Sustainable water resources management and enhanced management of karstic aquifers via recycling and reuse of wastewater by irrigation of agriculture and forestry lands; and 5) Effects of prescribed fire on soil properties and hydrological processes in forests of the Southeastern United States.

**Biography**

**Christophe Darnault** is Associate Professor at the Department of Environmental Engineering and Earth Sciences at Clemson University. He is the Chair of the South Carolina Section of the American Society of Agricultural and Biological Engineers. He serves as Associate Editor for Frontiers in Environmental Science – Soil Processes, Frontiers in Earth Science, section Soil Processes, and served as Associate Editor for the Journal of Hydrology (Elsevier). He is one of Clemson’s representatives for the Consortium of Universities for the Advancement of Hydrologic Science, Inc. He has research and teaching experience at Rensselaer Polytechnic Institute and University of Illinois at Chicago. He was also a visiting scholar at Yale University. He received his Ph.D. in Environmental and Water Resources Engineering from Cornell University, and his combined M.S. & B.S. degree (Diplôme d’Ingénieur) in Agricultural, Environmental, and Biological Engineering from the Institut Supérieur d'Agriculture, Lille, France (1995). His experience has also encompassed working as water resources group leader at Environmental Engineering and Technology, Inc. and as project engineer at Malcolm Pirnie, Inc. (now the Water Division of ARCADIS). Dr. Darnault’s teaching and research interests are in the fields of agricultural and biological engineering, environmental health and engineering, hydrological sciences, soil science, hydraulic engineering, and soil and water resources engineering and management.

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