GCSC Seminar Series

210 ASB
(Aline Skaggs Building)

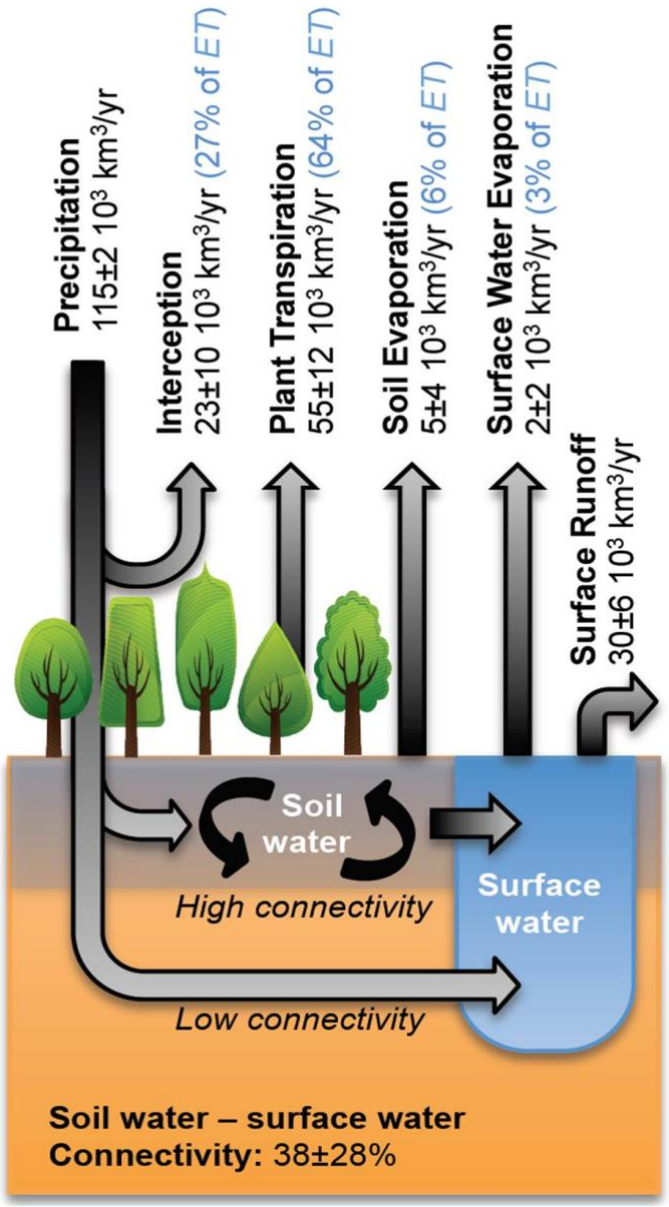
ALL ARE WELCOME

Refreshments & meet the speaker at 3:45

Tuesday, August 28, 2018
4:00-5:00 PM

Gabriel Bowen
Professor, Geology and Geophysics, University of Utah

"Water in the Critical Zone: How Soils Control Flows and Chemistry in the Terrestrial Water Cycle"



Precipitation that falls at certain times and under certain conditions is more likely to contribute to ground and surface water resources, and there is a need to better understand the processes within soils that govern these differences.

GLOBAL CHANGE AND SUSTAINABILITY CENTER
THE UNIVERSITY OF UTAH

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Abstract

Managing the water cycle to achieve sustainability goals requires understanding how dynamic processes that may respond to change impact water balance over scales on which water resources accumulate. In recent years, the application of isotope tracers to study water flow through the Critical Zone has provided support for the long-standing concept that the movement of water through soils is heterogeneous, and hinted that this heterogeneity may have important implications for the fate of precipitation delivered at different times. I will present three studies, spanning scales from individual soils to the globe, that suggest that this bifurcation of the water cycle within soils, also known as the "two water worlds"[1] hypothesis, exerts real and detectable influences on the structure of water flows through terrestrial hydrological systems. This concept provides dynamical links between soil structure, climate variability and extremes, and water resource quantity and quality that need to be better defined and represented in models of future water cycle change.

Bio

Gabriel Bowen is a Professor of Geology and Geophysics and member of the Global Change and Sustainability Center at the University of Utah, where he leads the Spatio-temporal Isotope Analytics Lab (SPATIAL) and serves as co-director of the SIRFER stable isotope facility. His research focuses on the use of spatial and temporally resolved geochemical data to study Earth systems processes ranging from coupled carbon and water cycle change in geologic history to the movements of modern and near-modern humans. He has coauthored more than 120 peer reviewed papers and book chapters, and his work has been supported by grants from the US National Science Foundation, other US government agencies, and private foundations. In addition to fundamental research, he has been active in developing cyberinformatics tools and training programs supporting the use of large-scale environmental geochemistry data across a broad range of scientific disciplines, including the waterisotopes.org and IsoMAP.org web sites and the Inter-University Training for Continental-scale Ecology training program (http://itce.utah.edu).