Geophysical Research Abstracts
Vol. 13, EGU2011-13165, 2011
EGU General Assembly 2011

The water table at continental scales

Lars Marklund (1), Tom Gleeson (2), Leslie Smith (2), and Andrew H. Manning (3)

(1) Swedish Meteorological and Hydrological Institute, Norrköping, Sweden (lars.marklund@smhi.se), (2) Department of Earth and Ocean Sciences, University of British Columbia, Vancouver, BC, Canada, (3) U.S. Geological Survey, Denver, CO, USA

Water tables at regional to continental scales can be divided into two distinct types: recharge-controlled water tables that are largely disconnected from topography and topography-controlled water tables that are closely tied to topography. We use geomatic synthesis of extensive hydrologic, geologic and topographic data sets to quantify and map water-table type over the contiguous United States using a dimensionless criterion introduced by Haitjema and Mitchell-Bruker [2005], called the water-table ratio, which differentiates water-table type. Our analysis indicates that specific regions of the United States have broadly contiguous and characteristic water-table types. Water-table ratio relates to water-table depth and the potential for regional groundwater flow. In regions with recharge-controlled water tables, for example the Southwest or Rocky Mountains, USA, water-tables depths are generally greater and more variable and regional groundwater flow is generally more important. Water-table depths are generally shallow and less variable and regional groundwater flow is limited in areas with topography-controlled water tables such as the Northeast USA. The water-table ratio is thus a simple but powerful criterion for evaluating regional groundwater systems over broad areas.