Modelling climate change impacts on groundwater recharge in a semi-arid region, southern Okanagan, British Columbia

Michael W. Toews

The impacts of future predicted climate change on groundwater recharge resources are modelled for the arid to semi-arid south Okanagan region, British Columbia. The hydrostratigraphy of the region consists of Pleistocene-aged glaciolacustrine silt overlain by glaciofluvial sand and gravel. Spatial recharge is modelled using available soil and climate data with the HELP 3.80D hydrology model. Climate change effects on recharge are investigated using stochastically-generated climate from three GCMs. Recharge is estimated to be ~45 mm/year, with minor increases expected with climate change. However, growing season and crop water demands will increase, posing additional stresses on water use in the region. A transient MODFLOW groundwater model simulates increases of water table in future time periods, which is largely driven by irrigation application increases. Spatial recharge is also used in a groundwater model to define capture zones around eight municipal water wells. These capture zones will be used for community planning.