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Assessing the climate change impact on the hydrology of Spencer Creek watershed based on RCMs and an interpolated GCM

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The future changes in climate variables such as temperature and precipitation in Spencer Creek watershed located in Southern Ontario, Canada are studied by using Regional Climate Models (RCMs) and interpolated Global Circulation Model (GCM) outputs. The RCMs are the North American Regional Climate Change Assessment Program (NARCCAP) climate simulations for the future period 2040 to 2069 and the GCM is the Institut Pierre-Simon Laplace Coupled Model (IPSL) global model that has been interpolated down to 50km, same resolution as the RCMs. Following a bias correction of these variables, the ensemble data are used as an input to a hydrological model to assess the seasonal and inter-annual flow future changes of the Spencer Creek. Results show that both temperature and precipitation will increase and as a result the Creek discharge. The outputs are compared in order to study the advantages and disadvantages between using interpolated GCM or RCM climate simulations forcing data in deriving the impact of climate change to the hydrology of the Creek and assess the uncertainty of the hydrological projections.