SIGNIFICANCE OF GROUNDWATER DYNAMICS WITHIN HYDROLOGIC MODELS

THE SIGNIFICANCE OF GROUNDWATER FLUXES ON SURFACE WATER FLOW

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The project will develop a high-resolution numerical model with HydroGeoSphere (HGS) (Aquanty, 2018) that improves the understanding of the interaction between groundwater and surface water systems using the Alder Creek Watershed (ACW) in southern Ontario.

High quality data from various components of the hydrologic cycle will be used to first calibrate the model. The model will then simulate a 3-year annual cycle of hydrologic fluxes.

The output will be a fully-integrated hydrological model that will deepen our understanding of the role of groundwater flux in watershed hydrology.

Improved ability to diagnose and predict hydrologic changes arising from climate and land use change

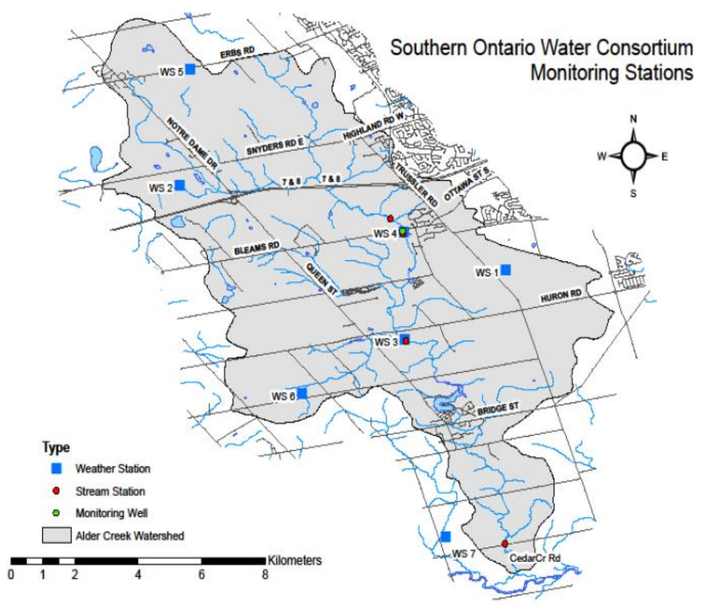
The developed high-resolution HGS model should be able to provide physically-based predictions of changes to surface water and groundwater arising from the growth of Kitchener-Waterloo region and long-term climate change.

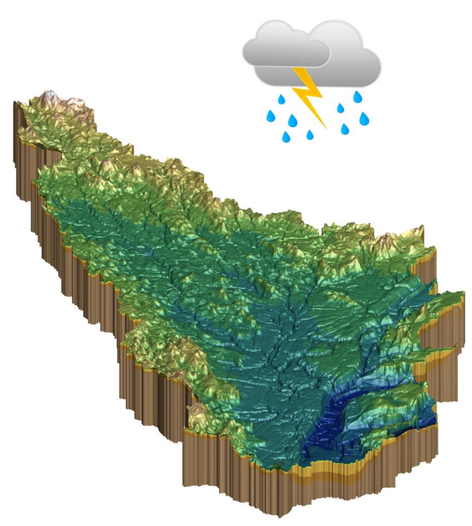
Improved predictions of contaminant transport in both surface water and groundwater systems

The model will be further developed and used to better understand agricultural chemical and road salt transport in both surface water and groundwater. If successful in the Alder Creek Watershed, the model will be expanded to the entire Grand River Watershed.

Demonstration of a "living model" concept

The continuous updating of the developed model with municipal wellfield operation, groundwater levels, surface water levels/fluxes, meteorological and other data (e.g., fertilizer and road salt applications) will demonstrate the "living model" concept. Such a model should be widely utilized by various entities.





3-D view of a fully-integrated surface and subsurface watershed model

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