

Estimation of Regional Groundwater Recharge over Canada Through Assimilation of Satellite Observations in Land Surface Models

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Regional groundwater assessment models are required to quantify impacts of land use and climate on water resources. In Canada, much of the population and agricultural production can be found in a narrow southern region where surface water can be limiting. However, conventional groundwater models do not usually include detailed land surface parameterizations both due to complexity of coupling land surface and ground water models as well as the need for consistent input parameters. A land surface model capable of coupling to standard groundwater models is presented. A strategy for parameterizing this model using multiple sources of both fine and coarse resolution satellite imagery is discussed. Applications to large regional aquifer systems surrounding Toronto and Montreal, Canada are provided. Comparisons to existing model assessments of groundwater recharge and baseflow are performed. Finally, an approach to extend this assessment to basin scales is described.