

The authors are grateful for the thoughtful review by Anonymous referee # 1 (19 May 2022). In the following, Anonymous referee #1's comments are in regular font, and the authors' responses to the comments are in blue Italics following the heading, "Authors' Responses". Changes to the manuscript are then described under the heading, "Changes to the manuscript".

Report #1

Submitted on 19 May 2022

Anonymous referee #1

The authors have addressed most of the comments. The manuscript has been improved after revision. I just have another two comments:

The authors indicated that one interesting study that could be conducted in the Alder Creek watershed is the impact of land-use change on groundwater quality/quantity. What are the corresponding land use types of observation wells that provide groundwater data? Is this data could be provided.

Authors' Response:

The publicly available Grand River Conservation Authority (2017a) dataset (mentioned in Table 8) shows land use as a raster map with 20 m by 20 m cells. Older land use maps or possibly air photos may be available for comparison. For example, the Southern Ontario Land Resource Information System, (<https://data.ontario.ca/dataset/southern-ontario-land-resource-information-system>) compiled by the Ontario Ministry of Natural Resources shows a snapshot of land use around 2000 (vector GIS data). The locations of the observation wells in the GIS data portion of the Wiebe et al. (2019) dataset could be overlaid on this map to estimate the land use at each location. Some work on the topic of land use change has been performed by Matrix and S.S. Papdopoulos Associates Inc. (2014b), one of the references mentioned in Table 8.

Table 8 lists the most current information for the watershed and would be a starting place for an in-depth study. Other sources of information than the ones listed in Table 8 would include data that are not immediately publicly available (i.e., not posted on a website) but would be available by request (for instance, from the Regional Municipality of Waterloo). MSc and PhD theses from the University of Waterloo (available online at: <https://uwspace.uwaterloo.ca/>) may also contain additional information for the Alder Creek watershed.

We believe that overlaying the GIS locations of the observation wells on the land use dataset listed in Table 8 is relatively straight-forward and would answer the question posed by Anonymous referee #1. For this reason, we recommend no further changes to the manuscript.

Changes to the manuscript:

None

The melting of the snowpack is important for hydrological processes in the Alder Creek Watershed. Could more information be given regarding the melting of snow (e.g. timing)?

Authors' Response:

Thanks for this suggestion. The timing of snowmelt (on a daily basis) has previously been estimated for the Alder Creek watershed by Wiebe et al. (2021) based on the degree-day method discussed by Rango and Martinec (1995).

Changes to the manuscript:

A note referring to the Wiebe et al. study has been added at line 168 within the paragraph that discusses snowfall measurements. The two new sentences refer to a hydrology textbook (Dingman, 2015) and to a paper by Rango and Martinec (1995) on calculating snowmelt. Both new references have been added to the list of references.