

## ***Interactive comment on “An Arctic watershed observatory at Lake Peters, Alaska: weather-glacier-river-lake system data for 2015–2018” by Ellie Broadman et al.***

**Ellie Broadman et al.**

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We thank anonymous Referee 1 for offering constructive feedback on our manuscript. Below we have indicated the actions we plan to take to address each of the items noted by this reviewer. Referee text (R) and author responses (A) are indicated.

R: Authors are commended for submitting a very polished manuscript. Before it can be accepted for publication in as-is form, they are advised to address the following minor concerns. In Fig. 4, the three lines (in grey, black and red) should be explained.

A: We agree that this figure caption should be more explicit. A more detailed caption

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will be included to explain the purpose of the three lines in Figure 4. The red line is the 1:1 correlation line for reference, while the black and grey lines are the correlations between precipitation recorded at the 850 m meteorological station and precipitation recorded at the 1425 m station (black) and 1750 m station (grey).

R: In section 3.3, it is described that TROLL was installed in a stage cage, which moved. Readers and potential users of the data will benefit if more discussion is added regarding how the use of the data can appropriately account for this movement. It is not clear from the provided database if the locations of the cage in different years are identified.

A: We concur that the statement that the cage shifted several times in Chamberlin Creek is unclear, without providing context regarding how this affected our dataset. We will add clarifying information to Section 3.3 of the manuscript. We also provide explanation here, for your information. In Carnivore Creek, there was no significant shifting of the TROLL and Hobo sensors attached to the cage, except that instruments failed during the August 2015 flood, at which time data were downloaded. While the TROLL water pressure data were used for Carnivore Creek, the TROLL shifted in Chamberlin Creek (as the reviewer noted), and therefore the Hobo data provided a more complete record at Chamberlin Creek. The Hobo instrument in Chamberlin Creek did shift on one occasion on 06/04/2015, and was reestablished in a slightly different position on 06/05/2015. We corrected for the small shift in instrument position by comparing water pressure from the Hobo and TROLL and adjusting the early season Hobo water pressure to match data from 06/05/2015 through to the end of the season. Data from the TROLL instrument, which shifted several times in 2015, were not used, other than the subset of data that was used to correct the Hobo water pressure. Further detail will be added to Section 3.3 of the manuscript to clarify the quality of the hydrological data given that the Chamberlin Creek hydrological station (TROLL and Hobo) was secured in a different location in 2016. The coordinates of the hydrological stations for each year are given in the Arctic Data Center link for this dataset, and this will be clarified in

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the manuscript.

R: Presentation of Section 4 is much appreciated, especially as it highlights the tracing of an event through the Lake Peters system. To this reviewer, the publication of data is supposed to spur/support other modeling and/or diagnostic research in the watershed. Hence, the authors are encouraged to add a (sub)section on the sufficiency of data set for hydrologic/hydraulic/water quality modeling and/or diagnostics of process interactions in the watershed. While this reviewer fully recognizes the challenges associated with collection of data in arctic watersheds, given the range of other data sets that are usually needed for modeling, it will be good for readers to recognize beforehand if the data set is “complete” to perform modeling/diagnostics. If the data set is lacking in this regard, please acknowledge the limitations and suggest ways for overcoming them. Furthermore, a discussion should be added about the possible science questions that can be answered using the presented data set, which will encourage data-use beyond the data collectors.

A: We agree that one of the primary goals of these datasets (although not the only objective) is to support modelling efforts in the watershed and region. As suggested, we will add a subsection to section 4 that describes how the data can be used for hydrologic, sediment transport and sediment deposition modeling, including the shortcomings of the datasets and suggested methods for overcoming these limitations, as well as possible science questions that can be answered using the datasets.

For a formatted version of this comment, please see the supplementary PDF.

Please also note the supplement to this comment:

<https://www.earth-syst-sci-data-discuss.net/essd-2019-60/essd-2019-60-AC1-supplement.pdf>

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Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2019-60>, 2019.