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Earth System Science Data Discussions

Interactive comment on "A long-term hydrometeorological dataset (1993–2014) of a northern mountain basin: Wolf Creek Research Basin, Yukon Territory, Canada" *by* Kabir Rasouli et al.

Anonymous Referee #2

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GENERAL COMMENTS

This manuscript submission describes a very unique long-term meteorological forcing and performance assessment dataset from the Wolf Creek Research Basin in Northern Canada. The authors present the dataset in a very simple and straightforward manner, while simultaneously demonstrating the effort required to prepare the data for use in a modeling or validation exercise.

The largest drawback of the dataset is that precipitation is only reported at daily time

scales. The rainfall ratio is given as 51% at the highest elevation site, and 61% at the lowest site (pg. 7, lines 28–30), meaning the WCRB lies well within the rain-snow transition elevation for its latitude. From an energy balance perspective, knowledge of when precipitation falls throughout a given day is crucial for determining precipitation phase. However, this drawback to the data does not have any bearing on the quality of this manuscript or affect the overall uniqueness of the dataset.

I recommend the manuscript be accepted after **minor revisions** have been addressed. These revisions are outlined in the following sections.

SPECIFIC COMMENTS

pg. 3, line 18 - How was the land cover image derived? Please describe.

pg. 3, line 22 - Just a suggestion: when referring to water years, "from 1993–1994 to 2013–2014" could be simplified to "water years 1994–2014". This occurs later in the text, as well. Also, the definition of a water year is never given in the text.

pg. 3, line 33 - The fact that precipitation is reported daily is mentioned only in passing. The reason(s) for not providing hourly precipitation should be described here.

pg. 4, line 12 - I would like to see a description of the snow survey methodology here at the end of this paragraph. (e.g. why are there 25 depth measurements to the 5 density measurements, and how are these measurements arranged?)

pg. 5, line 13 - Were the Standpipe gauge data corrected for undercatch similar to the Nipher gauge data?

pg. 5, line 18 - WSO is never defined.

pg. 5, line 22 - Rather than requiring the reader to go find that paper, how about providing a description of how phase was determined in just a few words and then citing the paper?

pg. 5, line 26 - This is an excellent way to fill gaps. Nice!

pg. 6, line 10 - How were these roughness lengths chosen? Citation?

pg. 6, line 31 - Should the REBS acronym be defined? I am unfamiliar with these instruments.

pg. 7, line 8 - The last sentence of this paragraph could be removed. Presently, it seems to be telling the reader how *they* should identify uncertainties in this dataset, but the reader did not collect the data. The responsibility of keeping detailed field notes is up to the data collectors. This sentence begs the reader to ask "If I want to identify uncertainties, were detailed field notes made and are they available?"

pg. 7, line 15 - You mention that albedo increases were used to help identify snowcovered periods. Were these albedo data derived from the shortwave radiometers? Were the outgoing shortwave measurements coherent with the incoming shortwave for all hours?

pg. 8, line 21 - Define the A2 scenario.

Table 4 - Provide the values of the a and b coefficients in Eq. (8).

TECHNICAL CORRECTIONS

pg. 2, line 13 - ...and has extensive parameter measurements.

pg. 2, line 19 - ...a long, cold snow season...

pg. 3, line 10 - Change "...pre- and post-move." to "...before and after the move."

pg. 3, line 15 - "A digital elevation model, or DEM, ..."

pg. 3, line 16 - "The DEM, ..."

pg. 4, line 7 - "...at the forest site and ..."

pg. 4, line 10 - "...snow depth, snow density, and snow water equivalent (SWE)..."

pg. 4, line 24 - Change "...it may be best..." to "...it is best..."

pg. 5, line 16 - "...wind undercatch are listed in Table 4."

pg. 5, line 32 - "...cumulative rainfall at the Standpipe gauge (R_S^{sh}) and rainfall at the Whitehorse WSO site..."

pg. 5, line 34 - "...the alpine site, a relationship..."

pg. 6, line 1 - "This equation..."

pg. 6, line 2 - "...the alpine site, the relationship..."

pg. 6, line 18 - "...after the gap was used."

pg. 6, line 33 - "Eq. (10) was used ..."

pg. 6, line 34 - "...wind speed, and if not available, cup anemometers..."

pg. 7, line 1 - "...when wind speed exceeded 5 ..."

pg. 7, line 29 - "...precipitation, decreases..."

pg. 8, line 13 - $8°C$?

pg. 8, line 14 - "Soil temperatures"

Table 2 caption - "...measured in three sites in the basin..."

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