

***Interactive comment on “Water-balance and hydrology research in a mountainous permafrost watershed in upland streams of the Kolyma River, Russia: a database from the Kolyma Water-Balance Station, 1948–1997” by Olga Makarieva et al.***

**Anonymous Referee #2**

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Water-balance and hydrology research in a mountainous permafrost watershed in upland streams of the Kolyma River, Russia: a database from the Kolyma Water-Balance Station, 1948-1997

General comments: The manuscript presents a unique data set from a permafrost region on meteorological parameters, soil frost data and hydrological parameters. There is a general lack of well documented and comprehensive hydro-meteorological

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datasets (with sufficiently long time series) from permafrost regions and this fact solely motivates the publication of the present study. In times of climate change and discussions of impact on hydrology due to warming permafrost the base line data is of extra importance. Thus, the fact that only historical data is presented here is not a problem, it can be used in the scientific community in order to better understand the permafrost-hydrological system pre warming. The manuscript is well written and structured, however the authors should consider doing some structural edits according to suggestions below. Also, the title of the manuscript is misleading the reader since no water balance is presented for the study site. The different components of the water balance is presented, but no suggestions on how to set up the WB is given. I would recommend to change the title in order to better describe what is included in the manuscript.

Specific comments: 1. Introduction: I recommend to go through the already published data sets in ESSD related to hydrological data in permafrost and arctic areas. It would be nice to get a more thorough picture of available data and how the data in the present manuscript complement already published hydrometeorological data from the arctic regions.

2. Site description: The permafrost conditions is described. How about taliks in the area? Taliks have great impact on the interaction between permafrost and hydrological flows, describe shortly the presence of taliks in the areas and where they are found (under lakes or rivers) and what type of talik that is most common (open, close, through)

3. Data description: The data description and main results are given in the same section. I would recommend the authors to separate the technical description of equipment, installation techniques, measured time periods etc from result presentation of the collected data. A new chapter 4 presenting the main results for each parameter should facilitate for the reader. Inter- and intra annual patterns in the data should be presented in the results section and not in section 3 as it is presented in the present version of the manuscript.

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4. A table early in chapter 3 summarizing the measured parameters including details of measurement period, periods of data gaps and used equipment and/or methods for evaluation of data would give a better overview of the presented data, reference to observation points in the map in Figure 2 could also be listed in the table.

5. There is no or very little information about uncertainties and accuracy for the equipment used in the investigations. If information is available (given that the measurements were performed long time ago and technical descriptions of used equipment can be hard to find) a complementary section about uncertainties would rise the quality of the manuscript.

6. Precipitation data: No details are given about the correction of precipitation data. I guess the data presented are uncorrected for wind and adhesion losses. Given that much of the precipitation fall as snow, the under-catch might be high and the errors due to this have to be discussed. Motivate why data is not corrected and provide the reader with necessary information about the location of the precipitation bucket/meteorological station to a proper correction can be made. The under-catch in wind exposed areas can be as high as 30-40% during the snowy season. References to methods for correction and how this has been handled in other hydrometeorological studies should be given.

7. The data in Pangaea: A complementary data set with maps in ArcGIS format would facilitate the use of the data-set in future studies. A base set of catchment geometries, land use, soil distribution, location of lakes and rivers, topography etc would make it much easier for data-users to set up proper hydrological models of the study site.

8. Tables: The sites referred to in the tables are in general hard to find in the map in Figure 2. A clear coupling between site ID and the map must be given. The map, including the labels and legend, have to be enlarged. 9. Row 261: "Snow cover at KWBS is formed in the first weeks of October" . . . based on data for which period? Give correct reference. 10. Row 271: How is the SWE quantified? By weighing the snow or by calculation?

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