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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Water balance and its intra-annual variability in a permafrost catchment: hydrological interactions between catchment, lake and talik" *by* E. Bosson et al.

Anonymous Referee #2

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The manuscript, I think, attempts to describe the water balance of a small catchment in Greenland that is underlain by permafrost and includes a lake, which is underlain by an open talik. The authors present field measurements representing about one hydrologic year and attempts to evaluate the individual water balance components through a simple modeling framework.

Bosson et al use large words at the beginning regarding what the manuscript is supposed to include, but I am sorry to say, the data itself, the presentation of the data and the interpretations are not living up to those promises. At its best, the material reads like an internal report and not a scientific manuscript aimed to advance our un-

derstanding of the Arctic hydrologic system. The organization is poor (methods, results and discussion are mixed between respective section, tables/figures are not numbered in the order they are referenced etc), field measurements or calculations are not described (how did the authors come to the presented SWE values, PET, and sublimation to give some examples). The authors keep referring to the Supplement Section for details, but I find that to be a rather poor solution in presenting information that is essential to the manuscript. An excessive amount of space is utilized to describe what the paper will be about instead of letting the results speak for themselves (to avoid overselling the product, which is currently a problem). Figures and their units are unclear, terminology is sloppy (lake level and pressure is used as it was the same thing, it is not acknowledged that the active layer thaws throughout the summer etc). I think the authors are putting too much confidence in their field measurements, including how representative they are for the larger watershed both in space and time (this is just a one yr study). For example, storage in the active layer is solely determined by one soil moisture sensor and basin SWE value from one meteorological station. In fact, I think assumptions like those is a reoccurring problem of the paper. For example, the authors are making a big deal about their mismatch in the different estimations of groundwater flow under the lake during the "frozen period" and spend pages on exploring why that is. I really don't see the point of the "three cases" as that section is not leading to anything more than what is already brought forward, especially since terms are estimated as residuals of previous equations. On top of it all, the authors have done a poor job in referring to existing literature and I think the manuscript could be dramatically improved if they took their time to review (specifically older) publications on permafrost hydrology in general, and lakes and taliks in particular.

To conclude, try again. Drop the advertising a few notches, acknowledge past literature and let the data speak for itself in an effort to find what story your field efforts can provide in relation to the existing literature on Arctic hydrology. Perhaps focus on a lake-talik-permafrost theme?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 9271, 2013.