

Interactive comment on “Hydrological and meteorological investigations in a periglacial lake catchment near Kangerlussuaq, west Greenland – presentation of a new multi-parameter dataset” by E. Johansson et al.

D. Rets (Referee)

retska@mail.ru

Received and published: 24 March 2015

General Comment Importance and uniqueness of the measurements presented in the paper is doubtless due to many reasons. First of all, it is an overall scarcity of data on cold-climate highly glacierized regions, that is naturally arisen by their remoteness and harsh working conditions. Moreover the dataset is detailed especially on some components. Some rather rare parameters were measured (such as sublimation and evaporation that are estimated through energy-balance calculations) that can be of special

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



interest to some researches. The possibility of visualization due to installed time lapse cameras can be very convenient not only for familiarization with the object for those who have never been there, but also a good instrument for verification of modeling of different processes. At the same time the choice of a site for hydrological and meteorological installations measurement doesn't seem so obvious in the context of the main goal of the project. As it is mentioned in the text the regional climate is dry and the main source of water in hydrological system is melt water from the ice sheet. In spite of this fact a precipitation-driven lake watershed that can't be representative for the region has been chosen. The dataset is detailed and contains some rare measurements, and can be used for modeling of some hydrological processes, especially in the soil, as the study seems to be focused on this aspect. However, isn't impossible to model the entire water cycle from precipitation to outflow from the watershed, as some crucial components are missing and some measurements are fragmental. For example, the snow water equivalent measurements were conducted only in 2011. The other totally missing component is lake water temperature measurements, which is needed to set start conditions for the model and to verify the results. The lake freezing process is of great importance to the water level regime and interaction with ground waters taking into consideration the climate specifics and lake coverage of the watershed.

Specific comments: 1. The total amount of groundwater wells makes a conspicuous figure. However an objectivity of groundwater level data for the watershed can be substantially diminished due to the uneven distribution of groundwater wells: mostly in valleys bottom. 2. It isn't quite clear how the ground surface and the top of casing (TOC) levels of each well were determined relative to the lake level, supposing the lake level to be a variable characteristic. 3. A rain/snow precipitation threshold temperature was set in the research on 0°C that differs from commonly used values that are slightly above zero. 4. "The time series on lake level data (corrected for barometric pressure) was compared 5. to manual measurements of the lake surface level"– The result of the comparison is interesting, because in practice not all automatic water level measurement instruments provide an appropriate for the hydrological studies accuracy. 6.

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

It is mentioned that water level regime in well 13 and 14 is different from other wells situated downstream the TBL catchment area, but it is not displayed in a figure, nor described. 7. In the Figure 8 A the soil water content seems not to react on precipitation events during the period from the beginning of July to the beginning of August. And then in mid-August soil water content experiences relatively sharp rises firstly in the deeper layer, then in the upper layer. How can this graph be explained? 8. It is said a few times that some measurements were made “when field crew was present at the site” but never specified, how often that visits took place. 9. The dataset can be easily downloaded from the site, everything seems quite clear in the files. But there are also some recommendations: a) it would be more convenient if there were also time periods in the “read me” file for time series. b) is it possible to watch the material from the time lapse camera frame by frame and how? c) it was mentioned that author possess data on surface topography and lake bathymetry. But it isn't present in the dataset

Misprints: A wrong reference on a figure in 5.5.2 and in 5.5.3. “Z_toc” and “Z_ground” is similar for 11 and 12 wells in Fig 7d.

[Interactive comment on Earth Syst. Sci. Data Discuss., 7, 713, 2014.](#)

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)