Comment on
“LamaH-Ice: LArge-SaMple Data for Hydrology and Environmental Sciences for Iceland” by Helgason and Nijssen submitted to Earth Systems Science Data

1. General

Dear authors, I was asked to act as a reviewer but declined because of a possible conflict of interest. I really appreciate your work and think that LamaH-Ice will become an important part for large-scale analysis, especially in the cold and glaciated region. The variety of static and dynamic attributes related to snow and ice cover are a novelty within LSH datasets and therefore of great value for the scientific community. You described the executed steps precisely in the article, the attached supplements are also a great support. The dataset is clearly structured and the attached text files give a nice orientation.

I didn't do a detailed review, but for a start, I noted a few points that I picked up while reading the preprint and browsing in the dataset:

2. Comments preprint

L180: Can you plot the size of your circles depending on the catchment size in Figure 1?

L224: On my site the line is more green than blue.

L244: What is WRF?

L267: Can you add a plot (like Figure 3d) between ERA5-L and CARRA at least in the supplements?

L268: What is with the snow, that was blown away? The influence of wind can be huge – at least in the Alps.

L269: Beside thaw events, sublimation and wind are also important factors.

L303: Note that the Budyko curve represents a reference condition for the water balance and meets not the variability on the whole globe. Deviations from the curve are therefore not always measurement errors. I think that in your case too low P or PET values can´t explain the deviation from the Budyko curve solely. Perhaps you can do a more detailed investigation here or explain the Budyko curve more clearly. Otherwise, most readers will think that the deviation is a big error.

L304: I think “higher ETA” is more sufficient than “high ETA”.

L305: Do you mean Figure 3c?

L307: What is with glacier melt? 68 of the 107 catchments are partly covered by glaciers.

L342: Do you have the positions, where the glacier measurements are done? A plot with the sites on the glacier and the intersecting 32 catchments would be nice (maybe for the supplements).

L371: Can you explain the high variability of PET especially in the south? Following Figure 5b) there are neighbouring basins with mean PET values of 0,5 and 3 mm/day within in a very short distance.

L461: I would refer to the supplement in all your subsections. The reference to S3.3 in the subsection 5.4 (land cover) is missing, for example.

L481: Sometimes there is Lamah instead of LamaH.

L596: Would it be possible to calculate an attribute indicating the deviation of the area from your basin delineation to those given by the data provider (IMO, NPC)? → see attribute “area_ratio“ in LamaH-CE

3. Comments dataset

a. There are two files in D_gauges/1_attributes/ for the gauge attributes (Gauge_attributes.csv and Gauge_attributes_.csv). In the readme file is no explanation for that.
b. Can you add the attribute “area_calc” in the file “Gauge_attributes”?
c. I would add the quality codes (including the code 250) in the readme file for the gauge attributes and add the code 250 (gap) in the supplement table S1.
d. The separator in your csv files is sometimes comma (e.g. gauge attributes) and sometimes semicolon (e.g. runoff time series). I suggest using solely semicolon as a separator.
e. Some special characters (e.g. æ) will certainly cause display problems for some users. This is just a hint.
f. Can you add at least the most important attributes to your Basin shapefiles?
g. Can you create metadata for your shapefiles that include at least a reference to your paper and a note that the units are described there in the tables? This will ensure the connection.
h. I imported your shapefiles in a GIS and saw that they all have the coordinate system EPSG 3057. In contrast, the text file “Folder_structure” and the readme files state that Basins_C.shp and gauges.shp have EPSG 3035.

Best,
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