



Comment on **essd-2021-48**

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Referee comment on "Baseline data for monitoring geomorphological effects of glacier lake outburst flood: a very-high-resolution image and GIS datasets of the distal part of the Zackenberg River, northeast Greenland" by Aleksandra M. Tomczyk and Marek W. Ewertowski, *Earth Syst. Sci. Data Discuss.*, <https://doi.org/10.5194/essd-2021-48-RC2>, 2021

General comments

The authors reported that efficient methods are needed to monitor and understand Arctic landscape changes in response to climate warming and low-frequency high-magnitude events. It is especially important because rate of ongoing and predicted climate warming in the Arctic regions is extremely high but quantification of geomorphological effects caused by glacier lake outburst floods (GLOFs) here is a critical issue. The ability to collect qualitative data about GLOFs direct impact is limited not just in the Arctic because they are hardly predictive.

To fill in this gap the authors provide a very high-resolution dataset representing time-series of data captured immediately before (5 August 2017), during (6 August 2017), and after (8 August 2017) the flood. Really there are two datasets: unprocessed images captured using an unmanned aerial vehicle (UAV) and results of structure-from-motion (SfM) processing (orthomosaics, digital elevation models, and hillshade models in a raster format), uncertainty assessments (precision maps) and effects of geomorphological mapping in vector format. This approach has been explained by the authors and looks reasonable.

Both datasets are easily accessible from Zenodo, well explained and presented. Quality, resolution and precision of data is very high, uncertainty assessment is provided in details. Methods are carefully explained. The authors describe limitations of the datasets and carefully explain how to avoid them. Potential applications of the presented datasets are explained in details. The dataset is connected with previous publications by the authors on the same GLOF event and its geomorphological role.

The manuscript is well written and free of technical errors, well structured, appropriate in length. All figures and tables are high-quality. The conclusions are clear and precise. The results obtained in this study are highly relevant to assess effect of 2017 flood and create a basement for future monitoring. Methods including uncertainty assessment could be used not just for Zackenberg River but elsewhere. I strongly recommend to publish the manuscript in *Earth System Science Data*.

Specific comments

In the Introduction it will be better to focus a bit more on glacier-related floods in the Arctic, especially in the Greenland, provide some more details on their observed and projected frequency and magnitude as well as on their geomorphic effect.

Lines 73-76 – it is not clear what discharge is normal during summer time. Some more details on river regime should be provided.

Fig.3. It might be better to show before-the-flood river channel on “After flood” series of maps, it makes this figure more reader friendly.

It will be great to add one more figure with DEM difference for some erosion and accumulation areas to provide more data on geomorphological effect of the flood as well to add some a brief information on erosion/ entrainment/ accumulation rates depending on channel slope angle and sinuosity, elevation change etc. despite most of the data has been published in (Tomczyk et al., 2020).