Chen et al. used Google Earth Engine to map glacial lakes in High Mountain Asia (HMA) from 2008 to 2017 with Landsat imagery. Their data is given in annual time steps, which so far is the highest temporal resolution of glacial lake inventory for the HMA. Thus, this kind of dataset if with fine quality could be particularly useful for scientific researches in changes of the cryosphere of the HMA as well as for related assessments and evaluations on the hydrological responds and glacial lake outburst flood risks under a changing climate in the HMA.

Noticed that recently there published a similar dataset produced by Wang et al. (2020), which includes two periods (1990 and 2018) of glacial inventory for the HMA and currently is also under review for the ESSD. The later one used a more traditional method and probably involved more extensive manually inspection during their investigations. When comparing these two datasets for the closest period (2017 of Cheng et al. and 2018 of Wang et al. 2020), I found there is a very large discrepancy (Table 1) in their results, although they have claimed that they used similar (not the same) area threshold (0.0081 km^2 of Chen et al. 2020 and 0.0054 km^2 of Wang et al. 2020) and distance threshold (within a 10 km from the nearest glacier terminus) for the lake mapping.

Table 1: Differences between two datasets of HMA glacial lake inventory

Source	Year	Total Numbers	Area_Sum (km^2)	Area_Max (km^2)	Area_Mean (km^2)	Area_Min (m^2)	Notes
Wang et al. 2020	2018	28953	1955.939	6.465	0.067	5400	Altai mountains included
Wang et al. 2020	2018	22219	1672.479	6.465	0.075	8100	Altai mountains excluded and area larger than 8100 m^2
Chen et al. 2020	2017	14477	1635.939	26.598	0.113	8100	Altai mountains excluded

In general, dataset of Chen et al. has missed a quite number of glacial lakes when comparing their results with the Wang et al. 2020's. In addition, they excluded the Altay and Sayan mountains, which actually should be included for an inventory study for the HMA. Even if excludes Altay form Wang et al.'s result, there still exist remarkable discrepancy in total numbers (nearly 7800 lakes) and total area (~37 km^2) between each other (Table 1). I agree with the Reviewer #1 that the missing inventory by Chen et al. is far from the range of uncertainty, but it was indeed errors due to the lack of systematic experts' check through the results, which were greatly depended on the methods they used when applying their procedures in Google Earth Engine.

The current attribute table of this inventory is too sample, that it even did not give an ID for each lake. Glacial lakes should be indexed with unique ID that could be used to connect with RGI or GLIMS glacier inventory dataset. In addition, the abbreviations used in the dataset (PGL, UCL and SGL) were totally not mentioned in the main text of the paper, we don't know what they meant.

For a dataset paper, it should avoid including any further analysis on the data (for example, the inter-annual variability of lake area presented in the section 5.2), especially when their results exist large uncertainty or errors. The authors should pay more attention to how to control the quality of their dataset. Although the Google Earth Engine offer the opportunity to calculate lake

inventory with a higher temporal resolution, I still strongly recommend they check through their result for each year, or maybe improve their methods to avoid errors as much as possible. Then a comparison between their results with existing datasets (such as datasets published by Zhang et al. 2015 or Wang et al. 2020) is necessary for audients judgement of the data quality. They did have do some comparison between their results with the Global Surface Water (GSW) dataset, but both these two were calculated by Google Earth Engine.

References:

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