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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "High-frequency glacial lake mapping using time series of Sentinel-1A/1B SAR imagery: An assessment for southeastern Tibetan Plateau" *by* Meimei Zhang et al.

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General comment: This paper aims at introducing new method for the monitoring of glacial lakes with emphasis given on GLOF hazards studies, using Sentinel images. My major concern to this study is that it is not clear what is the aim of it, since the methodology itself has been in detail described by Zhang et al. (2019). If the aim is to apply this recently introduced methodology, I'm sorry to say that it is not addressed sufficiently in the current version of the manuscript, especially in the light of its potential in GLOF hazard studies. For that, I would expect examples of monitoring of lakes which are interested for GLOF studies (generally GLOF susceptible), i.e. lakes which

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are proglacial, and time span all over the year. Instead, the authors show examples of lakes which are unconnected to glaciers (likely very old and stable) and only over a short period of time (July-August). Therefore, I see a mismatch between the story build in the introduction, pointing out the opportunity for employing in GLOF hazards studies, and actual content of the manuscript. While providing an insight into the evolution of selected lakes, the authors fail in providing more insights into the dynamics of lake level (and associated areal) changes in the whole studied region and all over the year. The main outcome, thus, seems to be the comparison with two other methods. While the performance of the proposed methodology is promising, I'm missing the evaluation of its performance in more challenging environment (i.e. proglacial lakes, analysed period all over the year) and the comparison with frequently used NDWI, and similar studies done, e.g. https://link.springer.com/article/10.1007%2Fs11769-012-0584-3. Considering the current length of the manuscript, there is certainly a space for addressing these issues.

Specific comments: L23-24: yes, but this is more the credit of Sentinel data L31: is this the case of the study area of Tibetan Plateau? L33-34: please explain how is dynamics of evolution related to GLOF hazards L50: please clearly distinguish from the results of the previous studies L56-57: this sentence needs to be supported by reference(s) L57-60: please provide reference(s) to support your statement L64-68: this is more a description what has been done; please define the main and the specific aims of the study L81: what is ice-layer temperature? L81: much larger and deeper compared to what? L138: regularized evolution term - not clear, please explain L146: why not to use all-year-long data? L154: what do you exactly mean by robustness here? L155: please refer to these methods properly L158: please describe these lakes in study area section L153: please specify how low (%) Figure 4c - I don't understand the meaning of this figure L176-178: not clear L206-207: not really addressed L209: rather use the name of the lakes L221: please specify these different environmental conditions in the study area section L245: this high frequency is exclusively related to the temporal resolution of the Sentinel data, not really to the method L249-251: this is not clear to

me L257: why did you choose to map only unconnected lakes? This does not make a lot of sense if claimed to be applicable in GLOF hazard studies L276-277: can you explain why not?

Unless these issues are addressed, I'm sorry that I can't recommend this manuscript for the publication in NHESS. I encourage the authors to include more analysis to meet my suggestions and submit the revised version of their manuscript.

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