

Comment on **essd-2022-242**

Anonymous Referee #2

Referee comment on "Flood detection using Gravity Recovery and Climate Experiment (GRACE) terrestrial water storage and extreme precipitation data" by Jianxin Zhang et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-242-RC2>, 2022

Major Comments^{1/4} □

1. How do you consider the detected flood (extreme values in TWSA) over the glacier regions? I do not see the demonstration for these regions.
2. Which term does the "high frequency signal" with the STL decomposition for the GRACE TWS? Does the final signal include a seasonal signal? It is not clear in Section 3.1, Please provide detailed explanations. I think sometimes the seasonal signal can also relate to floods.
3. How do you extract the flood day for different cases, I think the authors should show some figures (maybe time series) for a detailed demonstration. I do not think Section 3.4 is clear enough.
4. Which version of ITSG was used in this study? Please list it in Section 2.1.
5. Section 3.2, how do you evaluate/consider the reliability of the GESD test, please give a more detailed demonstration.
6. When I check the supplementary materials, I find that there are many differences among the spatial patterns of DFO-based, MODIS-based, and GRACE-based floods. More discussion should be drawn to improve this MS, the work in Gouweleeuw (2018) also showed that ITSG might not catch the flooded area well. Besides, how do you consider the different representation between terrestrial water storage (TWS) and runoff for one flood event?

Minor Comments:

1. Figure 3, the tick values of the x-axis should be denser.
2. P2L69^{1/4} □ what is the "other places"?
3. "Diksha Gupta et al (Gupta and Dhanya, 2020)"... in all the MS, these citation formats are strange, maybe wrong.
4. P3L109, what is the difference between the two citations of "Dill, 2008; Dill et al., 2008"?
5. P10L296, "Tellman1" to "Tellman"
6. The two references share the same data name, I think there is no need to put them on two websites. In addition, there is a mistake in the name of the authors. "Zhang, J., Liu, K., and Wang, M.: Flood detection using GRACE Terrestrial Water Storage and Extreme Precipitation (1.0.0). Zenodo. <https://doi.org/10.5281/zenodo.6831105>, 2022a.
Zhang, j., Liu, K., and Wang, M.: Flood Detection Using GRACE Terrestrial Water Storage

and Extreme Precipitation (1.0.0) [Data set]. Zenodo.

<https://doi.org/10.5281/zenodo.6831384>, 2022b.”

7. I do not think the reference format is right. “Mayer-Gürr, T., Behzadpour, S., Kvas, A., Ellmer, M., Klinger, B., Strasser, S., and Zehentner, N.: ITSG-Grace2018: monthly, daily and static gravity field solutions from GRACE, 2018.”

8. The references should be checked carefully.