This manuscript looks at the effect of a large landslide lake outburst flood in the Jinsha River on the adjacent hillslopes. The authors demonstrate that the flood caused channel widening and destabilized the hillslopes in a number of locations along the flood course. This is certainly an interesting and relevant topic, and I think that the authors nicely demonstrate that the LLFs have destabilized hillslopes and caused long-lasting slope deformation in susceptible hillslopes. However, there are several things that need improvement before the manuscript can be publishable, particularly the methods presentation. Also, although what is shown in the manuscript is nice, I found myself disappointed by the lack of depth in the analysis. The paper demonstrates that hillslope deformation following major floods happens, but doesn't explore any further. What influences the locations of the landslides? Did all slopes with tensile cracks end up moving, or are there some that didn't? What might influence the timing and rates of the post-flood deformation? It is nice to document that this effect happens, but I don't feel that I've gained much new insight into it.

Response: We added a few sentences in the Discussion part to settle these major concerns.

1) Response to "What influences the locations of the landslides? Did all slopes with tensile cracks end up moving, or are there some that didn't?":

We examined the deformation results and found there are mainly two types of slopes that have deformations. The first type of slopes has tensile cracks. There are no visible tensile cracks for the second slope type, though bank collapses are observable adjoin the active river channel. The former slope type has much larger area of tensile cracks, indicating low strength/unconsolidated slopes. In our study area, we found all slopes with tensile cracks have deformations after the Baige floods. Both types of slope slippage show that by undercutting slope buttress, hillslopes adjoin river channels begin to reach the threshold angle propagate the erosion of river to background landscapes (Larsen and Montgomery, 2012).

2) Response to "What might influence the timing and rates of the post-flood deformation?"

Figure 3 indicate the velocity of three slope deformations. All these slopes showed increased moving speed immediately after the floods, indicating that the Baige floods probably accelerated slope slippage. For MD-1, the speed decreased quickly after the floods, which may indicate the deteriorations of the floods' effect with time. For MD-2, we can also see similar deformation-time pattern before May 2019. The deformation continued with a lower speed from May 2019 to January 2020. It seems that the rainy months from July to September seems to play a role on the movement of MD-2 but not for MD-1.

More specific points:

1. Please provide some more information about the methodology. I only realized that COSIcorr is a software from reading the acknowledgments. There needs to be much more explanation of how the method works, exactly what you did, and any parameters or settings used in the COSI-corr software. In addition, there needs to be some information about uncertainty and potential errors in the numbers you obtain. Where does the 2 m cutoff from? And how is this related to the 10 m resolution of the Sentinel imagery?

Response: The following sentences have been added to improve the methodology part:
The principle of the method is to compare the difference in the reference image and the target image. There are two correlator engines to perform the procedure: The frequency and the statistical. The frequency correlator transforms the images into the Fourier domain and detect sub-pixel surface changes in the phase images, whereas the statistical correlator compares changes in the spatial domain (Leprince et al., 2007). The frequency correlator is more accurate to detect surface changes than the later correlator and is used in this work.

To perform the frequency correlator in the COSI-Corr, the initial and final window sizes are two major parameters to be defined. The final window is set no larger than the initial window size by default. For both windows, smaller sizes are sensitive to background noises, whereas larger window sizes often result in smooth results (Lacroix et al., 2018; Yang et al., 2020). In this work, we used moderate window size combinations of 64 and 32 for the initial and final window sizes.

Uncertainties in the derived surface deformation have several sources, such as DEM errors during orthorectification, solar angle differences between the reference and the target image, et al and can be estimated as the mean and standard deviation of displacements in a manually elected stable area (Bontemps et al., 2018; Lacroix et al., 2018; Yang et al., 2020). In this work, we used the stable area as Yang et al. (2020) near the MD-2 landslide.

In the work done by Cook et al. (2018), the uncertainty of manually interpreted active channel width is the spatial resolution of the used optical images. As we used the same method, the uncertainty of the measured active channel width is the spatial resolution of the Sentinel-2 images (10m).

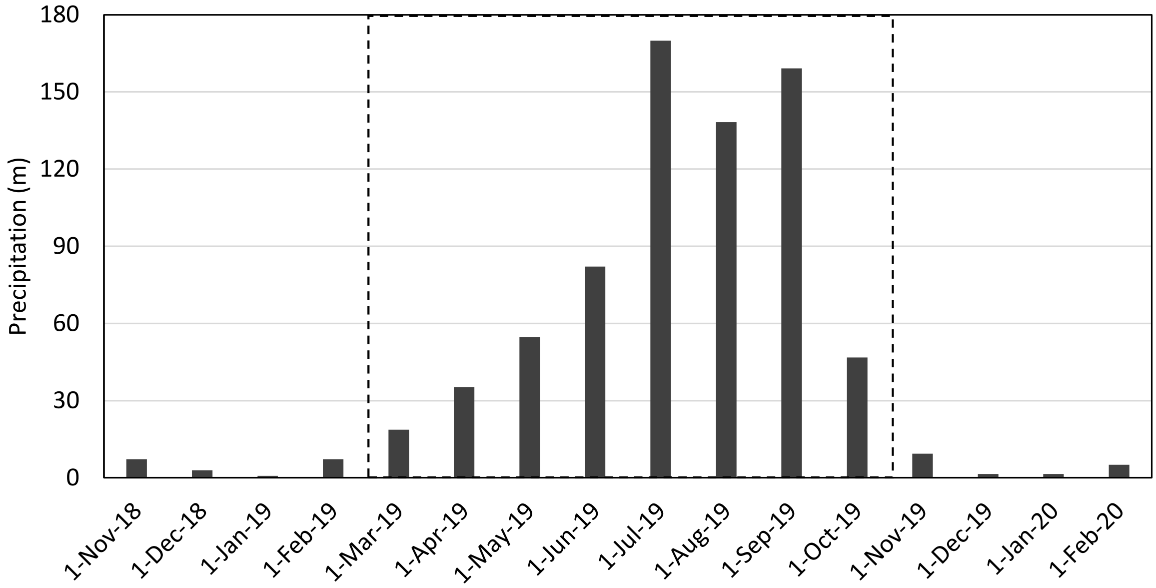
2. Is the Nov. 12, 2018 image from before, after, or during the flood on Nov. 12? If before, then how do you differentiate concurrent slope deformation from post-flood slope deformation over the larger area? Does the lack of change from 2015 to Nov. 12 2018 mean that the first flood had no effect?

Response: The Nov. 12, 2018 image was acquired during the second flood on Nov. 12. In this work, the concurrent landslides and post-flood slope deformations are very different from each other. The concurrent landslides are landslides that already occurred and can be manually interpreted by comparing feature changes in images before and after the floods, whereas post-flood slope deformations are landslides that have not yet failed and are calculated (accelerated) by the floods.

The lack of change from 2015 to Nov. 12 2018 does not mean the first flood had no effect, instead it may mean that the first flood has post-effect of slow deformations that cannot be detected in a short time.

3. The temporal pattern of displacement for the MD slopes is interesting, especially the correspondence between MD-1 and MD-2. Do you have any explanation for the changes in rate? Is it related to precipitation or river discharge? What happened in March 2019 when MD-1 and 2 both accelerated?

Response: As we examined from very high spatial images on Google Earth, all these three slopes have tensile cracks. Compared with the MD-3 slope, MD-1 and MD-2 are all stable slopes before the floods. Their consistent behaviours before and after the floods indicate that both LLFs indeed accelerate slope slippage. We agree with the reviewer that the deformation of slopes may be related to precipitation of river discharge, but we do not have daily or monthly hydrological data. We collected GPM monthly precipitation from Nov. 2018 to Feb. 2020 (Response Figure 5). Rainy season in 2019 begins from March to October. The beginning of the rainy season in March may explain the acceleration of MD-1 and 2 in March. The deformation continued during rainy season (March to October). However, the acceleration of MD-2 after 18 Jan. 2020 should be explained by other triggers except precipitation.



Response Figure 5. Monthly GPM precipitation near the MD-1, MD-2 and MD-3 slopes.

4. Line 22: reaches

5. Line 28: flux of what?

6. Section 2: I don't think materials and methods is the best descriptor of what's in this section. Maybe study area, materials and methods

7. Line 50: "created by the collision"

8. Line 51: replace grand plain with plateau

9. Line 55: "precipitation combined with active tectonics"

10. Section 2: this contains more than just materials and methods, so either rename or put the study area in a different section

11. Line 65: After Nov. 8, 2018, several excavators were deployed

Responses to comments 4-11 are accepted.

12. Section 4.3: I found this discussion confusing. What do you mean by downstream erosion? This whole section seems to be about slope stability, and not about things moving downstream. As well, the discussion of possible controls on slope stability seems very speculative. A strong earthquake could have weakened the slopes, but is there any reason to think that this has happened? Surely there must be some studies about landslide susceptibility in this region.

Response: We changed the title of the section to "Possible mechanism for hillslope stability". In addition, we added the following sentences to settle the concern raised in this comment:

We realized that to form the "landslide-LLF-landslide" hazard chain, weak riverbank hillslopes may be an important prerequisite. Tectonic activities such as earthquakes can usually weaken the strength of hillslopes. The Tibetan Plateau is a tectonically active region and often experience mega-earthquakes such as the Mw 8.6 1950 Assam-Tibet earthquake (Reddy et al., 2009) and the Ms 7.8 west Sichuan earthquake (Qi et al., 2011). We searched all earthquakes with magnitude >4.5 and <500km from the Mindu-1, MD-2 and MD-3 landslides in the last hundred years. There are 1026 earthquakes occurred with the largest magnitude of Mw8.6. The magnitudes of 54 earthquakes are ⩾ 6.0.

13. Lines 165-168 seem pretty repetitive of the point you have been making throughout the paper.

Response: These sentences has been removed.

14. Line 184-185: I don’t understand what you mean with this sentence

Response: The sentence has been changed to “The expansion of the active channels are bank erosions, including undercutting/erosion of the base slope and bank retreat.”

15. Figure 5: y axis looks like channel width, and not change in channel width. What determines the placement of the points on the y-axis? Does this have meaning, or are they just stuck on the width line? If there is no y-axis value for the points then they should not be plotted like this.

Response: We changed the y axis to “channel width” and made a new figure as below.