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Interactive comment on "Using Google Earth Engine to monitor co-seismic landslide recovery after the 2008 Wenchuan earthquake" *by* Wentao Yang et al.

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(1) The workflow and evolution of landslides following Wenchuan earthquake have been described in detail by many studies. So, without describing a new method (other than GEE implementation) and without providing substantial original insight to vegetation regrowth (TPI and Elevation are basically the same), the scope of the study shrinks to the technicality of GEE and a case information.

Response: In this work we proposed a new method to generate cloud free images to assess post-seismic vegetation recovery for the entire region. We also used the cross-

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correlation and Random Forests to quantify the importance of 12 major influencing factors. Please refer the response to reviewer #1.

(2) In section 2.2.2 authors described that they calculated EVI on 15th July. Well I agree with the date corresponds to growing season, but it is unclear that how the authors get data for July 15th every year for all the tiles necessary to generate EVI map. This part of methodology is very vague.

Response: Thanks for this concern. Because we established a post-seismic EVI model by using EVI observations for every pixel, we can use the model to calculate EVI on the 15th July of every year. We added the model (Eq. 1, please refer to Fig. 1 at the end of the response letter) to the revised manuscript.

(3) The limited growth of vegetation on higher elevated region can be because of several reason: persistent snow cover/ no loose materials to grow the roots or bare rocks / active landslides – high erosion / climate (rainfall and temp.). It is important to investigate these areas in detail using google earth images and deepen your discussion section.

Response: Thanks for your suggestions. We explored these places in the Google Earth and added some discussions to explain the slow vegetation recovery on top of the high mountains.

"Our finding that elevation is the most important influencing factors indicate that the slow vegetation recovery on high mountains may be controlled by cold harsh weather or persistent snow cover in winter seasons. We also explored very high spatial resolution images on the Google Earth platform and found absent of vegetation on both landslide scars and deposits. In warm humid climate, primordial plants such as lichen and moss may grow and lead to increased EVI. Therefore, we hypothesize that either the climate on high mountains or remobilization of these landslides inhibited vegetation recovery on landslide surfaces."

(4) Figure 2. it is quite misleading by showing high values of annual EVI increasing rate and then understands it is to multiply by 10ËĘ-3. Is this increasing rate statistically significant ?

Response: As we used a linear model, the model derived EVI on the 15th July of post-seismic years is changing linearly and statistically significant.

(5) Figure 3 C. How do authors calculate the landslide depth ? (source).

Response: The landslide depth is a rescaling of the landslide area by using the equation in Xu et al. (2016, Scientific Reports, 6, 29797). We added a few descriptions to make it clearer.

(6) Figure 3 L : basically all the type of trees/plants is damaged after the earthquake . So the comparison shown in Fig 3 L is meaningless

Response: We deleted this part of the analysis.

(7) Author wrote “We found >99% landslide surfaces have been recovering since 2008” . Where did this value comes from ?.

Response: We made a histogram of annual EVI increasing rate as an inset of Figure 2a. The histogram clearly shows that “>99% landslide surfaces have been recovering”.

(8) Section 4.4 is not a proper discussion.

Response: This part has been deleted.

(9) I am not qualified to judge the English, but I feel there is considerable scope to improve. For eg., Line 25 – ‘thousands of hundreds’

Response: Grammar of the manuscript has been checked and language editing services may also be used in later version of the manuscript.

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$$EVI_x = a_0 + a_1 \cos\left(\frac{2\pi}{T}x\right) + b_1 \sin\left(\frac{2\pi}{T}x\right) \qquad \text{(Eq. 1)}$$

where,

x Julian date, a_0 constant to be estimated, a_1 b_1 coefficients for intra-annual change for EVI.

Fig. 1. Eq. 1

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