Natural Hazards and Earth System Sciences Discussions

Nat. Hazards Earth Syst. Sci. Discuss., author comment AC4
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Complete response to RC1

Katy Burrows et al.

Author comment on "Using Sentinel-1 radar amplitude time series to constrain the timings of individual landslides: a step towards understanding the controls on monsoon-triggered landsliding" by Katy Burrows et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2022-21-AC4, 2022

Response to reviewer 1

We thank the reviewer for taking the time to review our manuscript. Below, we respond to the comments made in this review (in bold)

Very good and clearly explained work. I would only suggest only two things:

- **adding one/two sentences regarding the choice of using Google Earth Engine and its advantages compared to other options;**

New text added to Section 2.3 SAR data and processing:

"Google Earth Engine is a freely accessible, cloud-based platform that provides access to Sentinel-1 data without the technical expertise and computational facilities otherwise required to process SAR data. It also provides access to other datasets used in this study such as Sentinel-2

- **(maybe to add as a supplement material) a figure showing some landslides that have been successfully dated, how they appear in amplitude image before and after the failure and highlight the features of the three methods on them (the shadow area, the buffer around and or respective difference with the landslide body, etc.).**

We attach as a supplement two examples of correctly timed landslides, which were selected due to their having a different SAR signal in order to demonstrate:

1) A landslide from the Hiroshima dataset successfully assigned a timing interval based on a decrease in landslide vs. background amplitude (Method 1 of our manuscript), increased amplitude variability (Method 2) and the emergence of shadow pixels (Method 3). The emergence of bright pixels, which have been added as a 4th method in response to comments made by reviewers 2 and 3, are not applicable in this case since no bright pixels were identified within the landslide polygon.

2) A landslide from the Zimbabwe dataset successfully assigned a timing interval based on 1) an increase in landslide vs. background amplitude (Method 1) and increased amplitude

variability (Method 2). Methods 3 and 4 are not applicable in this case since no shadow or bright pixels exist within the landslide polygon.

3) A landslide from the Zimbabwe dataset successfully assigned a timing interval based on increased amplitude variability (Method 2), the emergence of shadow pixels (Method 3) and bright pixels (Method 4). Method 1, the difference in background versus landslide amplitude was not effective in this case.

Please also note the supplement to this comment:
https://nhess.copernicus.org/preprints/nhess-2022-21/nhess-2022-21-AC4-supplement.pdf