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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "A model for interpreting the deformation mechanism of reservoir landslides in the Three Gorges Reservoir area, China" *by* Zongxing Zou et al.

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Dear Editor and Reviewer, Thank you for editor's efforts on dealing our manuscript and reviewer's very kind comment on your manuscript. We have studied reviewer's comments carefully and made corrections as suggested. The revised portions are marked in RED in new manuscript (MS). Below we list every comment received (in italics), followed by our response in regular font.

General comment 1. The subject manuscript, "A model for interpreting the deformation mechanism of reservoir landslides in the Three Gorges Reservoir area, China" is an important case study of a large, deep landslide that has been affected by reser-

voir impoundment and fluctuations. The manuscript is logically organized, well written and presents a long record of data relating landslide movement, reservoir levels, and precipitation. Response: Thanks for reviewer's kind comments.

Specific comments: 1. My primary criticism of the paper is that the authors seem to be unaware of previous studies that have presented similar, closely related models to that presented in sections 2.2 and 2.3. Although most previous work cited in the following lines does not specifically address reservoir effects on landslides, the relationships between landslide geometry, deformation, dynamics, and stability identified in previous studies is relevant to the case presented in the subject manuscript. The model has concepts in common with the wedge method for analyzing landslides consisting of an active driving wedge and resisting block (Terzaghi & Peck, 1967; Sultan and Seed, 1967). Hutchinson (1984) presented an "influence-line" approach for assessing effectiveness of cuts and fills in stabilizing slopes, which is also similar to the models in sections 2.2 and 2.3. Iverson (1986) described relationships between stress distribution and landslide geometry. Baum and Fleming (1991) described the relationship between displacement patterns and the results of stability analysis, and derived expressions for the boundary between driving and resisting elements of landslides. Interestingly, they concluded that the boundary is near the thickest part of the landslide, consistent with the findings of this manuscript. Drawing on insights gained from these earlier studies, McKean and Roering (2004), Guerriero et al. (2014), Prokesova et al. (2014), and Handwerger et al. (2015) as well as others, have further explored the influence of slip-surface and landslide geometry on slide deformation, force distribution and landslide dynamics. In addition to strengthening the background section/literature review to show the rela- tionship of the authors' model to previous work. References cited: ïČij Baum, R.L., Fleming, R.W., 1991. Use of longitudinal strain in identifying driving and resisting elements of landslides. Geol. Soc. Am. Bull. 103, 1121–1132. ïČij Guerriero, L., Coe, J.A., Revellino, P., Grelle, G., Pinto, F., and Guadagno, F.M., 2014, Influence of slip-surface geometry on earth-flow deformation, Mon- taguto earth flow, southern Italy: Geomorphology, v. 219, p. 285-305.

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Response: Many thanks for reviewer providing these valuable references. We now add a background section to review these references and address the relationship between our work and the previous work (on Lines: 71-79).

Thanks again for editor's and reviewer's effort on our manuscript! Best regards,

Zongxing Zou, Huiming Tang, Robert E. Criss, Xinli Hu, Chengren Xiong, Qiong Wu, Yi Yuan

Please also note the supplement to this comment:
https://nhess.copernicus.org/preprints/nhess-2019-432/nhess-2019-432-AC2-supplement.pdf

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