

Response to reviewers

egusphere-2025-4531

Bayesian data selection to quantify the value of data for
landslide runout calibration

June 23, 2026

We would like to thank the editor and the anonymous reviewers for their valuable comments and suggestions, which improved the quality of the manuscript substantially. We present herein our responses to the comments of Reviewer #4.

Italicized line, figure, section and page numbers refer **to the revised manuscript**.

The changes of the revised manuscript with respect to the original manuscript can be retraced in the attached `Kumar_NPG_Production.pdf` file.

Legend

 Shows original reviewer comment

Response Contains direct response and explanations.

Resulting changes in manuscript Summarizes resulting changes in the paper.

Contains a direct quote of new or modified manuscript content with significant changes with respect to the original manuscript.

1 Comments of Reviewer #4

1.1 General comment

The paper presents a workflow to quantify the information value of different observational datasets for Bayesian calibration of landslide runout models.

The authors have adequately addressed the comments from the previous review round, and I recommend the manuscript for publication.

One minor remark concerns the Abstract. While it appropriately focuses on the proposed workflow rather than the landslide model itself, it remains rather general. It would be beneficial to include some brief information about the observational data needed, such as the types of measurements, their accuracy, spatial and temporal resolution, or measurement frequency. This would help readers better understand the practical context of the study.

In addition, the Introduction and literature review could more clearly distinguish between previous work and the novel contributions of the present study. At present, it is not immediately evident what has been done in earlier studies, what is fundamentally new in the proposed approach, and why this particular methodology was selected over alternative approaches. A clearer discussion of these aspects would further strengthen the manuscript.

Response

Thank you for this comment. We have revised both the abstract and the introduction to address the two points raised.

- **Regarding the comments related to the abstract:** We agree that the abstract would benefit from additional context on the observational data used to calibrate real-world landslide events. In the first paragraph, we therefore give examples of representative observation types, such as impact area and force time histories, distinguishing aggregated post-event measurements from time-resolved data. Furthermore, in the demonstration description in the final paragraph, we now state the observations being compared more concretely.

- **Regarding the comments related to the introduction:**

We have revised the introduction to make the boundary between previous work and our contribution explicit. We have added a direct contrast: whereas the most closely related studies compared posterior distributions qualitatively or via their modes, our approach quantifies the information gained and provides a metric for selecting the most informative dataset. The rationale for our key methodological choices is already provided in the same paragraph, and a broader comparison against alternative data-valuation frameworks lies beyond this study's methodological scope.

Resulting changes in manuscript

The abstract now characterizes the observational data both in its first paragraph and in the description of the demonstration (*p 1. lines 5-8; lines 17-19*), and the introduction explicitly contrasts prior work with the present contribution (*p 4. lines 107-113*).

2 Changelog of additional manuscript changes

In addition to the revisions requested by the editor and reviewer, we made the following minor changes, all traceable in the attached `Kumar_NPG_Production.pdf`.

1. Made the hyphenation of "information-theoretic" consistent throughout.
2. Corrected the typo in equation $\delta(s; \theta) = y - \mathcal{M}(s; \theta) = 0$ (*p. 7, line 192*) to $\delta(s; \theta) = y^r - \mathcal{M}(s; \theta) = 0$, consistent with its definition.
3. Clarified that the integral in the denominator of Bayes' theorem, not the posterior, is the evidence (*p. 8, lines 219–220*).
4. Corrected the typo in Table 1's caption, which incorrectly stated that "experiments 8-9" calibrate the discrepancy parameters; it is Experiments 7 and 8 that include the discrepancy parameters $\sigma_{\text{vel}_{\text{TS}}}$ and $\sigma_{\text{pos}_{\text{TS}}}$ (*p. 17, Table 1 caption*).
5. Replaced unspaced em dashes with spaced en dashes throughout, in line with house style.