Dear Dr. Wolfgang Schwanghart,

Thank you for the comments. Please see our replies below. Additionally, we did what is hopefully the final review, taking care of inconsistencies in names and formatting as well as word-smithing parts of the document to improve readability. Changes include lines 82, 88, 93, 320, 602, 625, 718, 756 but all edits are shown in the tracked changes document. All line numbers refer to the tracked changes document.

Thank you again for your comments and the multiple times you reviewed it.

Sincerely,

Jeff

Comments and replies:

18 - Please make sure to write out digital elevation model before the abbreviation DEM is used for the first time.
Done, please see lines 18 and 19

167 - other reduced complexity models, ... Please provide a reference.
Provided, thanks, please see line 169

192 - This sentence should be revised because the meaning of the term "meaningful" or "less meaningful" is unclear.
Thanks, to improve clarity, we ended up revising most of the paragraph (lines 190 to 205)

318 - From what I understand, this seems to be a Bayesian approach to model fitting. Hence, I wonder why the term Bayesian is not used.
Thanks, the calibration algorithm is now described as a Bayesian MCMC calibration algorithm (lines 22, 90, 330) and I made a small modification to the text to better match this description (line 338)

371 - Table 1: As an additional metric, please provide the mean initial landslide body depth (which can be easily computed from volume, width and length, I guess).
Thanks for the suggestion. I added “initial landslide body depth” to Table 1 (line 484). Landslide depth was measured in the field or from the DEM of Difference and landslide area, width and length were measured from a combination of air photo, Lidar DEM and field observations. The landslides are not perfectly square and I approximated a width and length at what appeared to me to represent the average width and length values. Now, Table 1 is updated so that width is approximated as area/length. This approach reduces the number of visually approximated variables (only length) but changes the width values in Table 1 by 5 to 15%, except for the Rocky mountain site, where I incorrectly used the diameter of the nearly circular initial landslide body to represent width. Now, in Table 1, volume/(width*length) = depth. Also, I clarified that a slightly different approach is used to determine

the width, depth, length, area an volume of the landslide at the Olympic Mountains site (Lines 486-487 and 501-504).

527 - Figure 7: The sampling dots are connected by lines. I assume these show the order of the MCMC samples. Please provide an explanation in the caption.
Thanks for the suggestion, I added an explanation to the caption (Line 550)

The notation is still somewhat confusing but I leave it to you to develop and implement a clearer way of indexing donor and receiving pixels. My recommendation is to use i (1,..,n) as a donor pixel, and j (1,...,n) as receiving pixels. n is the total number of pixels in a grid and j element Nr(i) are the eight pixels surrounding a pixel i. This would also be consistent with the index used in eq. 26 and 28.

Thank you for the suggestion. We use i for receiver node because it is introduced first in the text and j for donor node because it is introduced second. These indices are used in different methods per context, they are not uniquely used. We clarify this in the notation table at lines 856 and 864.

Also, in the notation, there are a few issues:

- i receiver node is missing
- A with double struck notation for erosion area is somewhat weird as it is commonly used for other mathematical entities. It is also the only notation with double struck used here. Consider using another one such as A_E.
- l is a strange parameter/value. How can you approximate the length of the runout debris by the length of the initial landslide body?

Thank you for the comments. i has been added to the notation table (line 856) and I changed A with double struck notation to A_E (lines 484, 826, 827 and 930). Using the initial landslide body length gives a minimum estimate for runout material length. We do note at lines 840 and 842 that l can be multiplied by a coefficient to better represent runout length.