Round 2 review for NHESS- 2023-114

General feedback
The authors have done a good job largely addressing reviewer comments and improving the manuscript. There are still some organizational issues with the writing that need to be addressed, in particular in the introduction. Find examples below. There are some small writing style changes that still need attention, which I have also highlighted below, and one general point still needs refinement. Once these have been addressed, I think the paper is ready for publication.

Thank you for your thorough review. We found your comments very constructive. We have tried our best to revise our manuscript in accordance with your suggestions. We hope that you will find that the responses sufficient for publication. If you should find that our responses are insufficient, we welcome further feedback on how to improve it.

It was stated in the response to reviewer comments that you will clarify that Flow-Py is considering the dense core flow of the avalanche and any potential runout associated with a powder cloud is not considered. The manuscript has not (as far as I can tell) been updated to reflect this. I don't think it needs elaboration or a discussion of the powder cloud, but rather a simple statement in the introduction of Flow-Py to clarify it models the dense core, as well as how the AutoATES v2.0 is based on dense core runout extents.

We have included a statement that Flow-Py is a dense core model (lines134-135) and that AutoATES v2.0 is based on dense core runout extents (lines 266-267).

"Recently, D'Amboise et al. (2022) presented a new customizable simulation package (Flow-Py) to estimate the runout distance and intensity of dense core avalanches (not considering powder clouds)."

"The Flow-Py model developed by D'Amboise et al. (2022) is used for the avalanche simulation of the potential track and deposition area. Flow-Py is a dense core model, thus AutoATES v2.0 is based on dense core runout extents and does not consider powder clouds."

Specific points to be addressed.
Lines 23-26: Sentence should be split to make interpretation easier.

We have split this sentence in the revised manuscript.

Line 30. 'Large-scale mapping' is used, though you said you would use 'regional-scale mapping' in the response to reviewer. It is fine to use 'large-scale' to discuss a something covering a large area, but 'large-scale mapping' specifically refers to map scale (and covers small areas). Maybe referring to large-scale ATES classification and avoiding use of the 'mapping' term solves the problem.

We will refer to large-scale ATES classification as suggested above.

Section 1 has several small paragraphs (including lines 79-81 which is a single sentence) that needs combining.

We have combined lines 79-81 with the paragraph above. We have also combined lines 59-69.

Section 1.1 has duplicate sentences/information (lines 95- and lines 103-). The same information is again repeated at the start of Section 2.4.1. where your customized implementation of PRA is introduced.

Thank you for discovering the duplicate information. We have removed lines 93-103 as we had rewritten the paragraph below (lines 103-) without removing the old text by mistake. We have also removed the repeated information from the start of Section 2.4.1.

Section 1.1 needs reorganizing to aid interpretation. For example the PRA is discussed in specific terms before being introduced in a general sense. The sentence beginning in line 113 should come at the start of the section before discussing the various methods of implementing a PRA with terrain and forestry data.

We have moved the sentence from line 113 to the start of section 1.1. We also believe that removing the first erroneous paragraph makes this section more easy to interpret.

Line 123: Citation does not need to be italicized.

We have the italicized text to regular.

Line 130: Typo 3-dimensional
Typo corrected.

Lines 131-133: While the computational power required to apply the process-based models over large areas is a factor, it is being done at regional scales (e.g., Bühler et al. 2022).

We have added this sentence: Even though the computational power required to apply the process-based models over large areas is a factor, it could be done at regional scales (e.g., Bühler et al. 2022).

Table 4: Square meters looks to be using subscript instead of superscript m2

Typos corrected.

Table 4: Inconsistent use of comma as thousands separator.

Typos corrected.

Line 402: Typo ‘, model, or model’

Typo corrected.

Lines 438-439: Typo, end of sentence unclear.

We have rephrased the sentence: Initial attempts by Larsen et al., (2020) compared AutoATES v1.0 to available linear and spatial ATES ratings in Norway, however the validity of these ratings was uncertain because they were developed with limited peer-review and could be biased.

Line 535: Avoid conjunctions; “We don’t know why this is…” could be “The reason for this is unclear…”

Thank you, we have changed the text to: The reason for this is unclear…

Line 547: Typo ‘boundaries’

Typo corrected.

Line 597: This is the first mention that Flow-Py is computationally ‘heavy’. One argument for using Flow-Py presented in section 1.2 is that it is more computationally inexpensive compared with

process-based models. I suggest re-phrasing the sentence or adding specifics for this limitation to have more utility to potential users. For example, reporting the run-time and computer specs for the benchmark sites.

We have rephrased this section as follows: In the context of large-scale ATES classification (e.g. Norway, 385,207 km2), Flow-Py becomes computationally heavy, which may present challenges when processing large datasets or applying the model in real-time applications. We executed the Flow-Py algorithm across all of Norway on an Amazon Web Services Elastic Cloud Compute Instance (AWS EC2 c6g.metal), which took 30 days to complete at a cost of $1,600. This could potentially limit the scalability and accessibility of the model for certain use cases and users with limited computational resources.

Line 560: Avoid emotive word choice ("Blindly applying the parameters…") by deleting 'Blindly'

We have deleted the word "blindly".

Line 604: Same comment as above. Sentence could read "Users should not adopt the input parameters provided in the paper without thorough testing."

We have deleted the word "blindly".

Line 617: Typo, missing 'of'

Typo corrected.

References

Bühler, Y., Bebi, P., Christen, M., Margreth, S., Stoffel, L., Stoffel, A., Marty, C., Schmucki, G., Caviezel, A., Kühne, R., Wohlwend, S., and Bartelt, P.: Automated avalanche hazard indication mapping on a statewide scale, Nat. Hazards Earth Syst. Sci., 22, 1825–1843, https://doi.org/10.5194/nhess-22-1825-2022, 2022