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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Brief communication: Post-wildfire rockfall risk in the Eastern Alps" *by* Sandra Melzner et al.

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General Comments:

The authors have done a good job of describing a particular natural hazard (rockfall after wildfire) in an area where this phenomenon has not previously been described. They further note correctly that this is not a well-studied phenomenon based on available literature. The authors use a good technical approach by examining a recent wildfire affecting a rock wall and its adjacent steep slopes known to be a source of rockfall. The concern is for the potential increase in rockfall in a location where people reside, and tourists regularly come to visit. This forms a case study to examine whether and/or how rockfall risk was influenced by the wildfire's impact to the vegetation and ex-

posed bedrock where rockfall might be initiated. The physical setting, the nature of the wildfire event, and the rockfall during and after the wildfire are well-described. Their work documents increased rockfall during and after the wildfire. Some observations suggest that falling trees and burned roots attributable to the wildfire are important to rockfall occurrence. Quantifying this effect, establishing a fire hazard rating for this region, and collecting additional data on post-wildfire rockfall activity are among the useful recommendations offered based on the Hallstatt wildfire example.

Specific Comments:

The authors define burn severity and fire severity interchangeably as suggested by Keeley (2009), one of their references. The field assessment teams responsible for post-fire hazards evaluation commonly use the term soil burn severity (as the authors note in their description of research described in De Graff et al., 2015). The different levels of soil burn severity (low, moderate and high) are more rigorously defined based on: Parsons, A., Robichaud, P. Lewis, S., Napper, C. and Clark, J (2010) Field guide for mapping post-fire soil burn severity, General Technical Report RMRS-GTR-243. USDA Forest Service, Rocky Mountain Research Center, Fort Collins, CO (USA), 49 p. (downloadable PDF available at: https://www.fs.fed.us/rm/pubs/rmrs_gtr243.pdf). This would make their interpretations of the fire effects a little more understandable for those who have experience in post-wildfire assessments or lack access to Keeley's paper. On line 24, the author's write that all the rockfalls described by De Graff et al. (2015) "..were initiated from scree slopes,. . ." This was not stated in the cited reference. The slope steepness and underlying lithology were given. On line 127, the author's write about chemical weathering into secondary clay minerals "which can approach the properties of a lubricant causing slope instability." Chemical weathering into secondary clay minerals can cause slope instability but is largely due to its being a lower strength material than the unweathered rock. "Lubrication" is an incorrect technical explanation. On lines 132 & 133, the author's write ". . .knowledge about post-wildfire rockfalls is limited, if not completely absent." The assertion "if not

completely absent." seems at odds with the four articles they cite at the beginning of the paper (lines 20-22). It is an insufficiently studied hazard and it might be correctly characterized as completely absent from studies in the Eastern Alps or some similar geographic designation. On lines 142 & 143, The Author's referred to conducting rockfall modelling to enable fast decision-making during and after the wildfire in terms of identification of possible endangered houses. This item in the Conclusions and Recommendations section is not supported by the previous sections. There are certainly pertinent observations made during that time. But there is no description of this data being provided in real-time to those responsible for public safety or fire suppression efforts. Perhaps, that needs greater elaboration in the earlier sections. Also, I would characterize this as risk assessment as part of an emergency response; not modelling. In the text on lines 93 thru 96, three articles are cited, Hall 1999, Yatsu, 1988, and McFadden et al., 2005. These three cited works are not found in the reference list of this manuscript.

Technical Comments:

Line 10: comma needed after "Alps" and before "no"

Line 18: "population growths" should be "population growth"

Line 24: "seven wildfire affected areas" should be "seven wildfire-affected areas"

Line 32: "very touristic" might be replaced with "heavily toured"

Line 33: Delete extra word ("in") before "A helicopter flight. . .."

Line 34: Might be clearer to say the survey was conducted "as a part of the project. . ." rather than "in the frame of the project. . ."

Line 44: "In the wildfire affected areas" should be "In the wildfire-affected areas"

Line 45: The citation (Melzner, 2015, 2017). Should that not be (Melzner, 2015, 2018)?

Line 51: an understory of "sparsely" bushes. . . should be an understory of sparse

bushes

Line 55: suggest change from "Precipitation as snow occurs normally between November and April snow cover can reach thicknesses. . ." to "Precipitation as snow occurs normally between November and April during which snow cover can reach thicknesses. . ."

Line 58: "glassbottle" should be two words

Line 63 thru 72: Dates should be stated in the format "August 24,2018" rather than 28.08.2018 in several places.

Line 65: ". . .injuries of habitants. . ." should be ". . .injuries of inhabitants. . ."

Line 75: ". . .and (vi) sowing of the wildfire affected scree and soil." Sowing what?

Line 84: "and the undestory plants and soil organic. . ." should be "understory"

Line 90: "Fire induced rock surface alteration. . ." should be "Fire-induced"

Line 92: ". . .the thermally induced stress event. . ." should be "thermally-induced"

Line 122: ". . .and the burn of trees/roots. . ." should be "burning of tree roots"

On the figures: I would make the letters (A, B, etc.) in the multiple image figures larger

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