

Review of HESS-2018-131

Precipitation characteristics and associated weather conditions on the eastern slopes of the Rocky Mountains during March-April 2015

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This paper presents an analysis of field observations collected in the Canadian Rockies during a 2-month period to better understand how precipitation reaching the surface formed. The authors looked at how precipitation was impacted by flow regimes aloft and could group all their events as being either dominated by westerly or easterly flows. The analysis has a strong focus on the characteristics of solid precipitation. This is a nicely written paper, based on sound data and nicely illustrated.

My main concern is that there is a disconnect between the motivation of the paper (the need to study precipitation extremes in the Rockies) and what the paper is really about. I understand that when you plan a 2-month field campaign, your chances of capturing an extreme event are very small. I also understand that undertaking such a field campaign is particularly demanding and that there is clearly a need for a unique dataset like this one.

Still, I do not understand why out of the 17 events included in the analysis, more than 50% are less than a mm. Actually, 8 of the 17 events are less than 0.2 mm! There is an important fraction of the paper dedicated to the 31 March 2015 event, where a total of 0.03 mm of water equivalent was observed. First, what is the measurement uncertainty of the precipitation gauge? Second, from a hydrological standpoint, what is the interest? Also, on line 8 of p.4, we are told that the cumulative precipitation for the March-April 2015 period is 73 mm. If I sum the precipitation amount of all events listed in Table 1, I get 19.29 mm. Where are the missing 53.71 mm?

I would suggest to remove all the events that are less than 1 mm and to rewrite the introduction (less emphasis on extremes and 2013 flooding) so that it better matches with the actual objectives of the paper.

I have two additional remarks.

p.8, l. 5-6: why is this the case? Explain briefly.

p.9, l. 14-22: Why discuss studies in northern Canada? I would rather focus on other studies looking at precipitation in mountainous terrain.