

Interactive comment on “Hydrometeorological conditions preceding wildfire, and the subsequent burning of a fen watershed in Fort McMurray, Alberta, Canada” by Matthew C. Elmes et al.

Anonymous Referee #1

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Review of nHESS-2017-312

The manuscript “Hydrometeorological conditions preceding wildfire, and the subsequent burning of a fen watershed in Fort McMurray, Alberta, Canada” provides a very thorough investigation of the hydrometeorological conditions and some of the burn parameters (depth of burn and fuel consumption) of a high-profile wildfire that led to the greatest financial wildfire losses in Canadian history. It is therefore of substantial interest well beyond the general readership of the journal.

The study has been conducted very thoroughly, the interpretations have been made very carefully and the manuscript is very well written. I have therefore only have a

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few minor suggestions and requests for clarification that I feel should be addressed to further strengthen the manuscript.

Introduction/Discussion: It would be useful for the international reader, particularly when considering those who may read it in future years, to set the Horse River fire into the wider context of burning in this wider region. I.e. some lines on ignition sources, area burned, burn depth and duff fuel consumption observed in other fires and years in this region. You could also state the evacuation need and financial losses that made this fire so high profile (e.g. <http://www.abc.ca/bc/resources/media-centre/media-releases/northern-alberta-wildfire-costliest-insured-natural-disaster-in-canadian-history>).

Methods: a) Burn depth was assessed based on survey data from well stick-up (length of PVC above ground surface). This is a little unclear. Would PVC length not have been potentially affected by burning? Is DOB determined at monitoring sites not affected by the fact that organic soils may have been somewhat compressed/disturbed compared here. Have there not been other systematic ground surveys of DOB?

b) Hydrometeorological data averages have been derived from 1996-2016 and are compared to 2015/16 data. Would it not be more meaningful to compare the 2015/16 situation with the average of the preceding period rather than including it when calculating the average?

Discussion/Conclusion: These sections have been phrased very carefully and are fully supported by the data. To strengthen the implications of the work, however, it would be very useful to provide a quantitative estimate of how frequent the synchronisation of these hydrometeorological factors may be in this region. What is their likely return interval under current and perhaps even future climatic conditions in this region?

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