

Interactive comment on “Historical drought patterns over Canada and their relation to teleconnections” by Zilefac Elvis Asong et al.

Anonymous Referee #1

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General comments: This study conducted a nation-scale analysis of drought condition in Canada. With different techniques for spatial pattern and temporal trend, the trends and their teleconnection with large-scale atmospheric indices were presented. Overall, the paper is well structured and analyzed. It can be published subject to the following revisions.

My major concern is that this paper should add a section for discussion. The results should be compared with the other regions or countries since this is nation-scale study. The uncertainties related to the PET method and data sources should be discussed. The mechanism why the drought condition is related to large-scale atmospheric indices should be discussed. Please find detailed information from the specific comments.

Specific comments: It is better to change the title as ‘Historical drought patterns over

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Canada and their teleconnections with ...’

The way the authors describe the importance of this study should be changed. If you always emphasize that the important part of this study is to analyze Canada, it will be regarded as a regional study. Contributions to the scientific community should be highlighted. For example, cold and arid region hydrology under the background of global warming, this is a good topic.

The method used to calculate PET probably influences the estimated drought condition since SPEI is the difference between P and PET. In general, the Hargreaves method used in this study underestimates PET compared with the PM method. The authors should realize and discuss the potential impacts from the method selection.

Section 2.4 to 2.6. It is not necessary to give details about these methods since they are very popular. They can be combined into one section to say how you are going to use them.

The drought conditions are closely related to large-scale atmospheric indices. Why? It is better to present some mechanism for these relationships.

The authors used two data sources, what are the differences for the results? What would you recommend for data selection?

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