Earth Syst. Sci. Data Discuss.,
https://doi.org/10.5194/essd-2018-126-RC1, 2019

Open Access Earth System Science Data Discussions

Interactive comment on "Fifty years of recorded hillslope runoff on seasonally-frozen ground: The Swift Current, Saskatchewan, Canada dataset" *by* Anna E. Coles et al.

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Received and published: 17 January 2019

In this paper, the authors summarize a hydrological and chemistry dataset from a set of experimental hillslopes in Saskatchewan, Canada. It is a very nice dataset, which deserves to be catalogued and preserved. Its value is certainly enhanced by the long period of record. The data are easily accessible from Government of Canada open data websites. Upon reading the paper, I felt like there should be more description of the data, and more information on the methods used to collect it. As it is now, the paper does not provide enough information, particularly of the latter, for new users of the data to maximize its usage. My comments, both major and minor, are below.

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Discussion paper

Page 1 Line 10: perhaps say “nutrient flux (or concentration or export)”

Page 1 Line 13: Perhaps pick one of “edge of field” or “hillslope” and stick with it throughout the paper.

Page 1: Line 20: The digital elevation data that are mentioned here should be introduced earlier in the abstract.

There are very minor grammatical errors throughout, the kind that can perhaps be addressed by a copy editor at the end of the review period. However, these should be fixed during the next revision via a thorough proof read.

Page 2 Line 2: I have never liked the phrase “to our knowledge” because they always reveal that the authors have not done their homework. For instance, the Experimental Lakes Area have been documenting runoff from several hillslopes since the 1970s. There are not many research hillslopes over frozen ground, but please do not perpetuate the idea that this is the only dataset that exists. Turkey Lakes, Trail Valley Creek, Wolf Creek, McMaster Basin; these are all places that have comparable data. Furthermore, aren’t the Swift Current hillslopes in existence? I suggest rephrasing non-existent to rare or uncommon. What is distinct is the period of record. Long, very long.

Page 2 Line 12: It has not been determined how applicable the results found at Swift Current are in other climates and landscapes. Perhaps temper the statement by saying “in this landscape or “in dry agroecosystems”.

Page 3 Line 2: It is unclear how the hillslopes were surveyed with the Leica instruments. Could the authors please provide information on the projection, datum and accuracy of the elevation data. Also, could you please describe the data. What are the mean elevation, slopes and relief, for instance?

Title of Section 3: Could I suggest rephrasing this? “Previous research”; “Prior research” Just some suggestions.

Page 3 Line 26: A lead in sentence would help here. “These data have proven valuable for the study of a variety of research relevant to the interactions among climate, hydrology, material export and agricultural practices.

Page 3 Line 26: Perhaps “long term” is a phrase that is not required throughout the paper.

Page 3 Line 27: Please expand on what each of these studies found.

Page 4 Line 2: Perhaps rephrase to: “The data have also been used to . . .”

Page 4 Line 5: The structure of this paragraph seems to jump all over. Categorize. Perhaps discuss 1) hydrological process studies; 2) effect of different ag practices; 3) material export a) erosion, b) nutrients, c) water quality; and 4) climate change.

Page 4 Line 11: Please describe the data and provide numbers. Range, average annual runoff, standard deviations, peaks, annual yields, etc. would all be interesting for the reader.

Page 4 Line 18: How were these heated? The authors should mention that the flumes are inside sheds. Maybe even provide pictures. This all helps people understand how the data were collected.

Page 4 Line 18: “The only event to exceed flume capacity was generated by a heavy rainfall event on 14 June 1964.” Please describe explicitly how this gap was filled. The paper needs to stand on its own, and not lean on citations to others that have described the methodologies used to collect the data. That is one of the major points of a data paper. Centralized information.

Page 4 Line 21: Please describe the nutrient export data and provide some plots illustrating the data.

Page 5: For each of the datasets, please describe the data and provide illustrations of them Section 4.3: “Snowpack characteristics were measured”. . .. Please describe the

equipment used during the snow surveys. Did this equipment ever change?

Page 5 Line 7: “The measurements were taken at the same nine points on each hillslope at which snow traits were measured (Figure 1).

Page 5 Line 9: “volumetric soil moisture”

Page 5 Line 10: What is the soil core method?

Section 4.6: Because these are publically available data from an operational national climate network that were not collected by the authors, I do not think they should be included.

Page 5 Line 23: There is no description of the agricultural practices data, or it is too brief. This is an important detail, which should be highlighted more with some kind of time series plot.

Acknowledgements: Willemijn Appels?

Figure 2: I am not sure this is the best way to present this data. The short events are really hard to resolve, especially once it gets into a journal. Contours, if you wish to use this kind of plot? Maybe split the x-axis, because nothing ever happens between August and February.

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