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Interactive comment on "Assessing the impact of acid rain and forest harvest intensity with the HD-MINTEQ model – Soil chemistry of three Swedish conifer sites from 1880 to 2080" *by* Eric McGivney et al.

Anonymous Referee #2

Received and published: 25 September 2018

In their manuscript, the authors apply an advanced model, HD-MINTEQ, to model the impact of acid rain and forest harvest intensity on soil acidification, in particular base cation status.

Soil acidification is an important global issue that sometimes seems a bit drowned in the attention for soil C cycling but is very relevant indeed. As such the study is of broader interest to the community of SOIL.

The study overall seems to have been well conducted in a sound, scientific manner

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Discussion paper

and the write-up and presentation is very good. One exception is the figures: because they are effectively a multitude of figures combined in 7 larger ones they are quite small and not always immediately comprehensible. This can relatively easily be amended by reducing some of the figures, or perhaps moving some to the supplementary material.

While the study in its core is well conducted, there is however one significant issue lacking and that is linking the study to the wider context. As said, soil acidification is a global issue of great importance. However, in their combined results and discussion section, and even their conclusions, the authors limit themselves to describing the results from the studied Swedish sites only. No real attempt is made to place the results in a broader context, or even to extensively discuss them in the context of other work on soil acidification in relation to forest harvest practices. As a result the reader is left to wonder what the significance of it all is. What do the modelling results mean for soil acidification globaly? Why is this model better than existing approaches, e.g. the ProdMod and ForSAFE models mentioned in the introduction? Can the HD-MINTEQ model be applied to other forest settings around the globe? If not, what is the remaining knowledge gap to be addressed? Such questions need to be addressed, and this will mean a significant overhaul and extension of the results & discussion (perhaps better to separate both into two sections), and the conclusions.

As no new data is needed for this, this should be feasible, but it does mean major revisions, which is therefore my recommendation.

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Interactive comment on SOIL Discuss., https://doi.org/10.5194/soil-2018-17, 2018.