

***Interactive comment on “Long cold winters give higher stream water dissolved organic carbon (DOC) concentrations during snowmelt” by A. Ågren et al.***

**Anonymous Referee #3**

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The manuscript by Ågren et al. describes an analysis of long-term data on DOC concentrations in a small forested catchment in northern Sweden. By controlling for the effects of discharge, the authors were able to identify other mechanisms that affect the peak concentrations of stream water DOC during snowmelt. This is a nice effort to extend the information derived from the monitoring data and a manipulative soil-frost experiment. The weighted PLS result that long, cold winters generated higher stream water DOC is certainly plausible and provides insight into below ground biogeochemical processes.

I am less convinced of the importance of this work from the perspective of ecosystem

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dynamics. While peak DOC concentrations are increased by long, cold winters, what is the impact on DOC flux from the watershed? From the list of variables in Table 1 it appears that this information is available and it certainly would be useful to know if higher peak DOC concentrations also yield higher total flux of DOC.

Additionally, the discussion on potential impacts of climate change focuses exclusively on winter climate. Given the topic of the research, this is an appropriate focus, but part of the DOC story for this watershed must also be the above and below ground terrestrial primary productivity that provides the C source for the DOC. Some assessment of future scenarios on this supply-side aspect of the DOC dynamics could make the discussion more compelling.

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