

Interactive comment on “Are hydrological pathways and variability in groundwater chemistry linked in the riparian boreal forest?” by Stefan W. Ploum et al.

Kevin Bishop

kevin.bishop@slu.se

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Variability in landscapes is a challenge for understanding how landscapes influence water chemistry in space and time. By developing a sampling design based on a hypothesis about how water is flowing through the riparian zone, this study has provided new insights into the hydrobiogeochemical structures that shape the connection between landscapes and waters. This has practical implications for the design of buffer strips that are widely used in water management. As such this paper can be a valuable contribution to the literature. I think its value would be enhanced if a few points in the paper got further attention.

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One concerns the distinction drawn between DRIPs and the confluences of ephemeral streams on page 5, lines 19-21. The text here was not clear. I think the authors are trying to say that such confluences are not included in their definition of DRIPS since DRIPS do not have clear channels. It would be good if this could be clarified.

A second point I suggest that the authors address concerns the discussion of relative contributions from DRIPs and Non-DRIPS to stream chemistry under different flow conditions (page 10, lines 29-34). This part of the discussion talks about the contrasting chemistries coming from DRIPS and non-DRIPS. But the effect of chemical differences in the source waters on stream chemistry depends on the proportion of water coming from the different source waters. Is there some assumption underlying this part of the discussion about how much water comes from DRIPs relative to non-DRIPS during high and low flow conditions? Clarification of that would help make the points in this part of the discussion more persuasive.

Furthermore, if the DRIPS do not include the confluences of intermittent streams with the perennial stream channel, it would be important to mention what these ephemeral streams are doing to contribute to the high-flow stream chemistry being talked about in the discussion.

One final question, the concept of a “DRIP initiation threshold” is mentioned on page 10 line 35, but a definition of what this means is not given. Please explain the term. .

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