

## ***Interactive comment on “Estimation of permafrost thawing rates in a sub-arctic catchment using recession flow analysis” by S. W. Lyon et al.***

### **Anonymous Referee #2**

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This paper represents an effort to estimation of permafrost thawing rates using recession flow analysis in the sub-arctic Abisko jokken catchment. It attempt to estimate the rate of permafrost thawing based on long-term streamflow data and explain the reason of permafrost thawing based on long-term climate data in this region. Direct observations of permafrost depth are difficult to perform at scales; the recession flow analysis indicates a long-term process of permafrost changes. This is a very important objective as very few researches have been taken in such long-term conditions. The authors do a good try and theirs job has meaningful. The paper is also nicely written and competent.

Major issues:

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1. The abstract, which have appropriately summarized the manuscript, should pinpoint the permafrost thawing is likely to change alone with climate change.

2. In introduction, the authors are exceptionally clear about how carbon and other biogeochemical cycling changes build on permafrost thawing in this permafrost region. In my opinion, the permafrost interaction with climate and frozen soil hydrology process in this region is also important. The authors should provide the study based on a review of this filed literatures.

3. The methodology, recession flow analysis, should be more clearly explained.

4. p65 L15: 'DIC' should be 'DOC'.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 63, 2009.

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