

## ***Interactive comment on “Degradation changes stable carbon isotope depth profiles in palsa peatlands” by J. P. Krüger et al.***

### **Anonymous Referee #1**

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The manuscript extends the Alewell (2011) paper and puts the concept into a geomorphic context. The data and the ideas are original, well-founded and deserve publication and further study. However, some issues are insufficiently explained or discussed and require further attention. Given the knowledge (or at least the specific ideas) about the distribution of the isotopic signature of soil carbon in palsa peatlands in the Abisko region, the hypotheses appear a little timid. As noted in chapter 2, you had more specific ideas about this. Why don't you make chapter 2 a part of the introduction, as the theoretical concept has already presented (as chapter 2) in the Alewell (2011) paper? Is the “degradation” of palsa hollows really degradation in the sense soil scientists are using it? From the manuscript, I understand that peat from the edge of the hummock falls into the hollow and accumulates on top of the portion of the hollow adjacent to the hummock. I wouldn't call that degradation. Ch. 4.1/4.2: The turning point signal isn't

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always clear to me and I have the impression that, at some sampling points, it could be elsewhere. Isn't it possible to generate some quantitative measures to support your (turning) points? Ch. 4.2, last paragraph: Why is the C-N ratio in more strongly decomposed peat lower? Given the low recalcitrance of many N compounds, shouldn't it be higher? Couldn't the high N content be a sign of lateral N import? Ch. 4.3/4.4: The C-N-ratio appears to be lower in the degraded hollows compared to the non-degraded hollows. Is that so? If yes, what could that mean? P 1384, L 26: Join the two sentences: "...Jungkunst et al., 2012), so this region contains..." P 1392, L 23: "...in more strongly decomposed soil..." P 1392, L 24: "favour", not "favours" P 1394, L 10: "significantly", not "significant"

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**BGD**

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