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Discussions

Interactive comment on "Where does streamwater come from in low relief forested watersheds? A dual isotope approach" *by* J. Klaus et al.

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We would like to thank Markus Hrachowitz for his helpful comments on the manuscript. Here we want to respond to his idea about splitting up the data set into different flow stages. In the revised manuscript we will also address his minor comments outlined in his review. Splitting up the stable isotope data into different flow classes is indeed a good idea and a helpful way to better understanding the temporal dynamics in the flow components.

In this case, we also have to keep in mind that the study period was mostly during drought conditions, i.e. most samples were taken during rather low flow conditions and dry catchment state. Nevertheless, we split our isotopes samples in three different

classes, based on the stream discharge at the time of sampling. The data set was split in thirds, consisting of a "high", "mid", and "low" flow condition. These flow stages would not represent the full range of streamflow variability in the observation period, but is based on the number of isotope samples. If we would separate the samples based on the measured flow duration curve, the number of samples in the high and mid flow conditions would be to few. In the following we summarized the slopes, intercept, and coefficient of determination for the individual linear regression. A total of nine regressions are summarized, three classes for each of the three streams.

R-stream low: delta2H= 1.3*d18O-18.0 R2=0.07

R-stream mid: delta2H= 2.2*d18O-13.2 R2=0.48

R-stream high: delta2H=2.8*d18O-10.0 R2=0.60

B-stream low: delta2H=2.9*d18O-9.7 R2=0.80

B-stream mid: delta2H=2.2*d18O-12.0 R2=0.82

B-stream high: delta2H=3.5*d18O-6.7 R2=0.86

C-stream low: delta2H=3.0*d18O-9.7 R2=0.24

C-stream mid: delta2H=2.3*d18O-11.7 R2=0.62

C-stream high: delta2H=5.1*d18O-0.4 R2=0.70

There is a tendency that the third of the samples with the highest discharge indeed showed the highest slope in the EWLs, indicating less enrichment, and thus stronger influence of the rainwater end-member. Nevertheless, the slopes for R and B are relatively low for every class, while the C stream showed a slope of above 5 for the highest flow class. This can indeed indicate changing contribution and relevance of sources of different wetness states (although the same pattern does not exist using antecedent precipitation were the highest and lowest class have the same slope). Only the C-stream showed statistically significant differences between the classes. We think this is a great add on, and a good next step, when a data set really samples a range of the flow duration curve. Here we are not sure due to the range of flow conditions, with the not so clear pattern, we would rather not go into to much detail in the revised manuscript. Nevertheless, we are happy to include this data after the end of the open discussion, if we agree on an added value of this exercise. We could add a small section in the discussion, where we show that change catchment state could influence the temporal dynamic of water sources. Although, this conclusions is, in our opinion, not fully supported by the data.

All the best Julian

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 2613, 2014.