Hydrol. Earth Syst. Sci. Discuss., 10, C5426–C5430, 2013
www.hydrol-earth-syst-sci-discuss.net/10/C5426/2013/
© Author(s) 2013. This work is distributed under
the Creative Commons Attribute 3.0 License.

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Identifying residence times and streamflow generation processes using δ^{18}O and δ^{2}H in meso-scale catchments in the Abay/Upper Blue Nile, Ethiopia" *by* S. Tekleab et al.

Anonymous Referee #2

Received and published: 7 October 2013

Identifying residence times and streamflow generation processes using d18O and d2H in meso-scale catchments in the Abay/Upper Blue Nile, Ethiopia

Authors: Tekleab, S., Wenninher, J., and Uhlenbrook, S.

General comments

This paper presents baseline information about residence times and stream flow generation processes in two catchments of the upper Nile River. The analysis is conducted

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

based on water samples taken between 2008-2011 of precipitation, stramflow, and spring water. The paper lacks proper discussion of the results and statistical analysis, In addition very little is mentioned about physical processes. The paper will benefit from separating the results and discussion sections. There is no mention about the advantage of using both d18O and d2H. Would the findings change if they only had one set of samples? If so maybe the paper could be shorter by eliminating one of them. Even thought is true that regional studies are few the manuscript would benefit from contextualization with other meso-scale studies in other continents. Finally the paper should be revised for grammatical and spelling mistakes which in many cases prevent the reader from understanding the content.

Specific comments (page number are indicate before line numbers)

Introduction

1. 35 lines 5-15: There are many more studies that are relevant and could be cited. The authors should focus on studies that have been conducted in catchments of similar size. In addition the authors should find papers in which the altitudinal, amount, and continental effects on isotopic composition have been explored.

2. 35 line 19: should it be affected instead of effected?

3. 36 line 2: A reference is missing here.

4. 36 lines 3-8: This sentence is very hard to follow.

Study Area and data sources

5. 37 line 13-14: This sentence is had to read.

6. 37 line 14-16: Either all scientific names are given or none.

7. 37 Line 17: Study should be plural (studies).

8. 37 16-23: It would be helpful if the authors include information about what the natural

HESSD

10, C5426–C5430, 2013

vegetation cover used to be.

9. 38 Line 4-6: the dates are wrong can't be from 2009 to 2001.

10. 38 line 7-12: wording is confusing.

11. 38 line 18: it should be evapotranspiration instead of evaporation

12. 38 line 18: Please provide some information about the Hagreaves method (i.e. input data, basic assumptions, etc).

Methodology

13. 39 line 5-7: This sentence is confusing?

14. 39 line 15: A one sentence paragraph is inappropriate.

15. 39 Line 21-22: I don't think it is necessary to give the equation.

Results and discussion

16. 44 Line 4: This section cites figure 3 in which all sources (precipitation, streamflow and spring water are shown. This figure has a lot of information that is not discussed in the paragraph. The paragraph could contrast different sources and cite also Table 3.

17. 44 Line 20: Have you tested if the differences between Yewla and Fana Choke are statistically significant?

18. 45 Line 2: Why the use of "nevertheless"?

19. 45 line 8-9: Very difficult to read.

20. 45 Line 12: Please explain the scatter in figures 5, 6, and 7.

21. 45 line 16: please add p-values.

22. 46 line 5-11: Please address the high degree of variability (standard deviation) presented in Table 3.

HESSD

10, C5426–C5430, 2013

23. 46 Line 12-29: Please add some statistical test to determine if the differences are significant.

24. 47 Line 2: Cite Table 3.

25. 47 Line 7-8: The explanation given for similarities between Debre Markos and Rob Gebeya spring water signatures seems week. Elevation at these sampling locations is not considerably different than the elevation at Yewla.

26. 49 Line 7 Cite Table 3.

27. 49 lines 8-17 very difficult to follow. I think the results need to be resented first and then discussed relevant literature. In addition it is hard to understand what the authors mean by “reveal the variation in catchment storage” (line 15) by just citing a figure. More explanation is needed.

28. 49 Please elaborate on the water balance findings (Line 15-17).

29. 49 Line 18: Figure 11 does not present d2H. Explain exactly what do you mean by damped. 30. 50 Line 1-2. Please avoid single-sentence paragraphs.

31. 51 line 19-22: This sentence is too long and confusing.

32. 51-52 The Uncertainty analysis section is poorly written and would benefit from some graphic display of results.

33. 52 Line 15-17: Discuss the strength of the fits presented in Figure 13. Is the methodology appropriate? What would the uncertainties in the estimated MRT of 4 and 6 months be?

34. 53 Line 9-11: One sentences paragraph should be eliminated. Also comparison with other studies should be included.

Conclusions

35. Elaborate on the weakness of the short term sampling and resolution.

HESSD

10, C5426–C5430, 2013

CC BY

Tables

36. Table 1: Should it be evapotranspiration instead of evaporation?

37. Table 3: How are the mean values derived? (i.e. how many samples were considered)?

Figures

38. Figure 1: Some rivers appear disconnected.

39. Figure 3: Defined LMWL and GMWL in the legend or caption. This figure has a lot of information. I suggest more careful description within the text (Page 44, lines 5-12).

40. Figure 4: Why some of the markers for d18O are missing error bars? Please explain both in the text and figure caption.

41. Figure 5: Please add p-values of R2.

42. Figure 6: I suggest using colors here because it is hard to understand. The caption needs to be reworded.

43. Figure 10: It is difficult to interpret. Please add land marks (i.e. ocean names, countries names, etc.).

44. Figure 13: what does "A" stands for? There is no mention in the text of neither the R2 nor of these "A" values.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 10333, 2013.