

Interactive comment on “Application of isotopes and water balance on Lake Duluti–groundwater interaction, Arusha, Tanzania” by N. P. Mduma et al.

Anonymous Referee #4

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Dear Editor, dear authors,

there is not much to add to the reviews given before: The paper presents an interesting data set for a data scarce region, but the way, how this data set is presented is problematic (methodological errors, missing literature background). Thus, I follow the other reviewers and do not recommend the publication of the paper in it's present form.

What strikes me most about this paper, is on the one hand the presentation of a huge set of equations, which are either unnecessary (e.g. equation 3 and 4, 5 and 6, 9 and 10_1 are exactly the same equations) or wrong (e. g. equation 7, as mentioned by the other reviewers) or contradicting (eq. 12 uses the fraction of lake water (f_L) to define δ_{mix} , while eq. 13 uses δ_{mix} for the calculation of f_L) and on the other hand the results

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of these calculations do not appear in the paper in a quantitative/ comparative way at all.

I think, this study could be an interesting paper, if the previous recommendations by the other reviewers would be considered (amongst others a detailed description of lake water column mixing processes should be provided) and if a) all boundary conditions of the local setting of the lake would be strictly analyzed and defined (and presented in the paper), b) the set of equations would be set properly (by considering the literature recommended by the reviewers 1 and 2) and c) if there would be a clear presentation of the quantitative results of the water balance calculations together with an interpretation/discussion what these results imply for the local aquifers and their management in a much more specific/quantitative way (e.g. what is the main gw flow direction in the study area and how/where does the lake system changes water availability?).

In summary, I recommend rejection, with the possibility to resubmit after implementing all required changes.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-176, 2016.

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