Hydrol. Earth Syst. Sci. Discuss., 12, C2232–C2234, 2015
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Hydrology and Earth System Sciences
Discussions

Interactive comment on "The Global Network of Isotopes in Rivers (GNIR): integration of water isotopes in watershed observation and riverine research" *by* J. Halder et al.

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Received and published: 25 June 2015

We would thank Gabriel Bowen for the review and comments. Please find our answers below: General comment: Additional important publications, which were pointed out and contributed to the existing knowledge as well as methods were added.

Specific comments: 4050L3-4: Added

4052L1-4: The database now publicly released (web link provided).

4060L14: Added

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Interactive Discussion

Discussion Paper

4061L3-4: Changed

4061L12: Changed

4062L15-20: We agree that lower measured d18O values in comparison to modelled d18O values do not necessarily require contributions from ice as of the problematic of model calibration. This is discussed p.4063L15-19. However, glacier melt water and permafrost are well known contributors in alpine and arctic rivers and therefore we expect such a signal in the isotopic composition of those river systems. We added: "The importance of glacier meltwater in those river systems was also evaluated by non-isotopic studies (e.g. Immerzeel et al., 2010; Huss et al., 2011). Especially in ungauged catchments but also in addition to quantitative studies this method may therefore be applied to evaluate glacier or permafrost contributions or observe winter/summer runoff ratios, as proposed by Bowen et al. (2011)". Moreover, also long-term GNIR stations with automated discharge weighted sampling (The Swiss dataset from BAFU, e.g. Rhone River), for which we can exclude the problematic of runoff ratios, showed such results. Moreover, for the RCWIP prediction, precipitation amount weighting functions (for each month of the year as well as for the grid cell) were used.

4063L11: See answer above.

4063L22-23: We rephrased to: "This finding underscores that the average isotopic composition of river water reflects amount averaged rainwater on a global scale, as it has been evaluated regionally for the United States by Fekete et al. (2006) and Bowen et al. (2011)".

The differences between modelled and measured isotope composition pointed out by Bowen et al. (2011) is primarily related to the sampling frequency, averaging, and errors in the modelling component, not to the fact that the averaged isotopic composition of river water is in general significantly different to that of averaged amount weighted upstream precipitation.

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4063L26-28: Added

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 4047, 2015.