Interactive comment on "Global isoscapes for δ^{18}O and δ^2H in precipitation: improved prediction using regionalized climatic regression models" *by* S. Terzer et al.

Anonymous Referee #2

Received and published: 25 July 2013

Terzer et al. presenting a new method (RCWIP) to predict the spatiotemporal patterns of stable isotopes of water in globe precipitation. Their approach goes beyond previous work in that they delineated 36 climatological regions and used a fuzzy based approach to determine fractions of memberships to one of these regions for the stations of the GNIP database. They combined this with a more flexible regression approach that includes geographic and climatic parameters. The new model approach outperforms the previous standard models.

The paper is very well written, the methods are sound, and good presented. Results are clear; discussion is brief, but suitable for the work. The paper is very well orga-

nized. The work goes beyond the current state of the art and contributes clearly to the isoscape work. I do have some minor suggestions to improve the manuscript. The influence of M2 on the results remains unclear. When the data is to scare M2 is used instead of M4, what is the spatial extend of the influence? How Man stations are pure M4, etc. A discussion and visualization would help to understand that. Other than that, I only have minor comments.

Thanks for the interesting read.

Specific comments. P7355 L21: Fig.2 is mentioned before Fig. 1 P7358 L20: Choosing m=1.5 seems somewhat arbitrarily. Determine an appropriate value for fuzzy c-mean study is always challenging, nevertheless some justification is needed here. P7359 L5: Fig.1 mentioned after Fig.2 P7363 Lines 20-22: Please provide some reasons of setting specific relationship between nugget and sill for the variograms. P7367 L12: The use of significance does not seem to be related to a statistical test and more of a subjective comparison between the RMSE values. The use of significance/significantly/significant should always be related to a test of significance and a corresponding p value. I would suggest using clearly. P7368 L15f: Authors usually exemplify their results with the 18O data, why now changing to the 2H data? Would be more consistent using 18O here. Please explain. P7369 L1ff.: It would be nice to visualize better where M2 and where M4 was applied, although I understand that this will be based on the fraction of each climate cluster. P7371 L 9: Use of "significantly" without the use of p value and a statistical test, please change. P7380: Font in figures might be too small for final print. P7384 Fig 4 caption Line 2: It should be 'five climatic clusters' but not 'five climatic lusters'.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 7351, 2013.