**Hydrology and
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Interactive comment on "Technical Note: A significance test for data-sparse zones in scatter plots" *by* V. V. Vetrova and W. E. Bardsley

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Our thanks for the thoughtful comments here. We too hope that identification of data-sparse regions might lead to some insight about hydrological processes that might not otherwise be evident.

With respect to the null hypothesis definition, it is noted in the Introduction that the null hypothesis is that an apparent data-sparse region in a scatter plot is in reality a consequence of random chance. However, rejection of this null hypothesis does not imply accepting an alternative hypothesis that the variables are correlated in the sense of being linked through some deterministic relationship coupled with independent random error of large or small degree. For example, it may be that the data field is comprised of a data-sparse zone and a data-abundant zone, but with random scattering of data

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points in both zones. Of course, it could happen that in some cases rejection of the null hypothesis is a consequence of data points being attracted toward some deterministic relation and so creating a significantly large data-sparse region. Considerations of the cause of a verified data-sparse region must be left to the investigators concerned, however. It may indeed happen, as suggested by the reviewer, that in some instances the verification of a data-sparse region may subsequently help to improve a regression relation. Our contribution is simply to propose a testing mechanism for the data-sparse region.

With respect to elaborating on what "swapping data" means for data assumptions, the randomisation test (random reordering of the x values) is robust in that it requires no prior assumption be made on the data with respect to the presence or absence of any form of association between the variables.

The above comments will be incorporated into the revised paper to clarify the issues raised.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 1335, 2012.

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