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Hydrology and Earth System Sciences Discussions

Interactive comment on "Statistical analysis to characterize transport of nutrients in groundwater near an abandoned feedlot" *by* P. Gbolo and P. Gerla

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The aim of this paper is to emphasize groundwater pollution in feedlot areas. Cluster and factor analysis were performed to analyze groundwater data from one feedlot which operated from 1970 till 2000. The document is well written and has very fluid reading. The problem is well defined and the approach is very consistent. In fact, the objective was to determine not only the relationship between nutrient concentration and groundwater movement, but also the major contributing nutrient to groundwater contamination in the study area. I reviewed the different statistical techniques which the author has used and some remarks seem interesting. âĂć The effect of sample small

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size (10) would be corrected by using bootstrap in order to reinforce results. âĂć The author opted for single linkage clustering which consider that clusters are close since even they have only a single pair of close points. This can handle quite complicated cluster shapes. A complete linkage would be more efficient. âĂć It would interesting to perform a permutation test in order to validate clustering results. âĂć In any case, it is not very useful to resort to cluster analysis since the units number is only 10. Factor analysis could be enough. âĂć An error has probably slipped when using factor analysis. Figure 6 (Scatter plot of the first two factors showing three clusters) seem strange. Coordinates appear in contradiction with the factor analysis. In fact factors cannot be correlated and individuals could not draw a linear trend. Finally, I noticed a typing error on page section 3.2, line 13, concerning correlation between nitrate nitrogen and nitrite nitrogen : r=0.91 and not r=0.96.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 1553, 2013.