

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

Anonymous Referee #2

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A number of – primarily - groundwater samples from a polluted site near an abandoned feedlot in the US were analysed using statistical methods including cluster and factor analysis.

General comment:

- 1) The data set used in this case study is very small and probably inadequate to infer the relevant nutrient transport processes. No time series are available to characterise, e.g., event driven nutrient transport.
- 2) The application of the statistical methods used in this study is not really sound (see

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my specific comments below).

- 3) As a consequence of my two points above, I am unsure if there is sufficient process insight coming out of this case study.

Specific comments:

Section 2.1.: what are the annual mean precipitation and the average air temperature? The latter is particularly important to understand the measured groundwater temperatures.

Section 2.3.2: you need to provide more detail here. Was data transformed and/or normalised? I would recommended this, in particular, because of the small sample size. Which rotation was used? How did the data matrix exactly look like?

P 1562, L1-4: This is not really a useful explanation of the low groundwater temperature at well SPS.

P1564, L 14: “maximal concentrated areas”: concentration of what?

P1564, L 17: Factor analysis as such does not provide clusters. You may cluster scores coming out of a factor analysis?

P1565, L5-6: how exactly can multivariate statistical methods be used for predictions?

Table 5: Loadings are coefficients of correlation between factors and water quality variables. They cannot be > 1. The numbers presented may be scores.

Figure 6: What is presented here? Rotated/unrotated scores? If so they should be uncorrelated.

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