

***Interactive comment on “Regional-scale identification of groundwater-surface water interaction using hydrochemistry and multivariate statistical methods, Wairarapa Valley, New Zealand” by M. R. Guggenmos et al.***

**Anonymous Referee #5**

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This study covers a very interesting topic, identification of groundwater-surface water interaction using hydrochemistry and multivariate statistical methods in the regional-scale, Wairarapa Valley, New Zealand. The paper presented comparable methods and results in identifying the interaction between surface and groundwater; introduction is comprehensible and complete; methodology is well explained; Tables and Figures is very clear and strong; and the conclusions covered overall objectives of the study and summarize research findings as well as recommendation for further investigation.

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The paper was well written to cover the mentioned issues. Following are some minor comments for your consideration in revising the manuscript: 1. The author used two factors for the PCA, and I recommend trying more factors, i.e. four factors. 2. I suggest trying K-means clustering analysis. 3. Table (1), S26/0001, it doesn't clear which value led to the identification of sites as outliers. 4. Table (2), I think there is no need to estimate TDS if you have measured EC. 5. Table (3), the value of HCO<sub>3</sub> in the first factor not in bold; also the phosphorus doesn't show any trend. 6. Page 6446, line 24-page 6447, line 6: using multivariate statistical methods of principle component analysis (PCA and PCFA) and Cluster analysis (HCA and K-means) is not widespread, but it is not neglected, many authors used this technique in studying groundwater and surface water interaction, see (Woocay and Walton, 2006, 2008). 7. Page 6452, line 15, delete the extra “the remaining”. 8. Page 6462, line 21, cluster A1 instead of 1A.

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