

Interactive comment on “Investigation of groundwater-surface water interaction using hydrochemical sampling with high temporal resolution, Mangatarere catchment, New Zealand” by M. R. Guggenmos et al.

Anonymous Referee #1

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For the Mangatarere stream catchment in NZ, three months of continuous data on water levels, temperature and electrical conductivity for two stream water gauging stations and one groundwater well were interpreted. Furthermore, measurements on major ions, nutrients and trace elements from one week of intensive sampling and water level data from an additional stream water gauging station were analysed.

General comments:

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This paper achieves some interesting experimental work. It analyses a potentially interesting data set, which may be used to compare processes governing water quality and quantity at downstream and upstream reaches. However, I have two major technical issues with this paper which need clarification before I would be able to fully assess its content.

(1) Figure 3, equation B1 and subsequent interpretation are inconsistent. From Figure 3, Mangatarere stream appears to gain water between GWRC and Upstream gauging stations. Therefore, recharge of groundwater from stream water would be impossible to infer for this reach.

(2) Mixing analysis presented in equation B2 is unsound. Groundwater input to downstream flow is not the sum of upstream and downstream flow. Furthermore, if the intention was to balance the reach between Upstream and Downstream gauging stations, then a mixing analysis is unnecessary.

Specific comment:

Figure A1: Second order polynomial fits water level- discharge relationship, including high discharge point, better.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 10225, 2011.

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