

Interactive comment on “How effective is river restoration in re-establishing groundwater – surface water interactions? – A case study” by A.-M. Kurth et al.

Anonymous Referee #2

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This is an interesting work on a timely subject. It is generally well written and I listed some minor comments below.

1. The Introduction chapter is concise and well written. A crucial and fundamental point is that you define “hydrogeological success as an increase in vertical connectivity” (1095, L29). While this is apparently motivated by an original state of (higher) vertical connectivity to be re-established (1095 L24), I wonder if this criterion can be easily transferred to other cases. Is it always the vertical connectivity that needs to be maximized, or e.g. would it be desirable to reach a spatial variability in high and low exchange rates, with potential positive feedback on biodiversity?

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2. I think Figure 1 (1112) could be improved, and especially the zoomed maps could be more informative, reflecting in a better way e.g. land use characteristics.
3. The argumentation why the Urbach and the Rothenbach represent (near-)natural hydrogeological conditions (1096-7, Chap. 2.1) needs to be improved. Do you have any quantitative, for instance morphological or hydrological, criteria? It also seems you should be clearer that the major (restored) study site is Chriesbach.
4. From the description on P. 1098 it is not clear, whether you perform passive and active or only active DTS measurements.
5. P1099: So you have measured the Chriesbach before 2006 by passive DTS? Please provide more details on relevant restoration phases in Chap. 2.1 (P1097). Otherwise the reader thinks, the pre-restoration phase ends in 2006.
6. P1099: how much bias is introduced in the results (Fig.2, 3) by different installations of the DTS (aboveground before and buried after restoration)?
7. P1101: Do you have any measurements of the groundwater temperature: is the value of 7.8°C a validated or measured reference?
8. Fig. 5: According to the colour scale it appears that the maximum value is higher than 7.6°C (P1101).
9. Chap.3.3 is very short. It would be interesting to get more details on measurements, field work, and data ranges, noise, etc.
10. P1103: To what extent can (temporal) noise from algae and debris occur, or in other words, are these factors only local and can they be always localized?
11. Can you compute volumes for “significant” amounts?
12. To what extent are the presented measurements representative? - not just in terms of space and site, but also in terms of time? I guess the Chriesbach is not a constantly loosing stream.

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