

Interactive comment on “Towards improved instrumentation for assessing river-groundwater interactions in a restored river corridor” by P. Schneider et al.

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Since actual field work is important to directly and indirectly estimate interaction between groundwater and surface water, the related field equipment and measurement strategies are of constant interest. Because of this I find the article of Schneider et al. very interesting and important because general guidelines for large scaled field campaigns are still missing. This paper therefore fills a gap in this more practical-technical problems in hydrological sciences and can lead to prevent errors and increase the efficiency of the applied field techniques. The article however is rather long and therefore

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I advice the authors to try to improve the connection between the preliminary surveys and the design of the observation network. In some parts of the article I have the impression that the different methods stand a bit isolated from each other, rather than they are supporting each other or that they are necessary to lead to an improved instrumentation scheme. Since the details will change from location to location and project and project a general statement of best practice would be very interesting.

Specific Comments:

Page 2505, L 21: How do aquifers ‘represent’ the land surface? The sentence should be reformulated. In my opinion it means that the aquifers where 40% of Switzerland’s drinking water is coming from cover just 5% of the land surface.

P 2507, L 22: check the punctuation mark!

P 2508, L 22: A variety of techniques has been...

P 2510, L 4: Space between ‘overview of’

P 2513, L 22: The ‘yellow contour’ lines appear in my print white or light grey. Check also my comments on Fig.2

P 2516, L 7: Cite here tab. 3 as well.

P 2517, L 19: I recommend including a reference. This article covers additional aspects of the thermal method not mentioned in the other references: Anibas, C., Fleckenstein, J., Volze, N., Buis, K., Verhoeven, R., Meire, P., Batelaan, O., 2009. Transient or steady-state? Using vertical temperature profiles to quantify groundwater–surface water exchange. *Hydrological Processes* 23, 2165–2177, doi: 10.1002/hyp.7289.

P 2517, L 26: The vertical resolution is meant here I guess.

P 2518, L 11: I would find it interesting if it would be explained more in detail how the preliminary investigations where leading to the design of the network of wells! Why for example where the described methods chosen? This I guess would be an useful

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information for other readers too.

P 2519, L 3-6: Check the sentence! It seems to grammatically not correct.

P 2519, L 24: How many monitoring wells have been installed or used on the site?

P 2520, L 9: It would be interesting to know how many and which monitoring wells have been installed and used for the first step. This could be indicated also in Fig. 2, and would show the temporal progression of the monitoring efforts.

P 2520, L 21: The connotation between the headers and the transects in Fig. 2 isn't clear for me. I would prefer a header like 'Pumping station transect A' or 'Pumping station transect (Fig. 2 A)'. Likewise I suggest a similar approach for the other headers.

P 2521, L 1: Where is the location of the pumping well(s) indicated in Fig. 2?

P 2521, L 2: The spacing between the monitoring wells, even dependent on head gradients and other parameters could be useful information.

P 2521, L 4: Each single paragraph about the description of the transects should refer to Fig. 2. Thus Fig. 2 A, Fig. 2 B, etc.

P 2521, L 13: How is the well spacing changing? How far is the closest well away from the river bank?

P 2523, L 15: I would add here 'see section 5.2'

P 2525, L 10-11: Which hydraulic model and what means DEM? Where in section 3 are these things specified?

Table 3: Mention the transects A,B,C,D,E (Fig.2) in the caption of the table! The crosses, lines and double crosses are neither explained in the table nor in the text (see P 11, L 26)

Fig. 1: Can you indicate the direction of flow of the River Rhine?

Fig. 2: Since this figure is a very central part of the paper I'm concerned that it is too

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small for its content of information. Is it possible to use the space better by turning in 90 degrees? Or magnified parts of it are used as an additional figure. At least on my printout I have problems with the colors of figure 2. Yellow solid lines of GW head appear to be grey or white and the bathymetric cross-sections are blue instead of gray. In the Legend the Water Surface seems to be mixed with Hydraulic head. Other figures like 9 or 10 show the explicit label of observation wells (R001, R002, etc.), but in the text or at Fig. 2 they aren't mentioned.

Fig. 3: It isn't clear where in the figure transect B and transect E are ending, since the river itself certainly isn't part of them. I suggest adding 'Transect B' and 'Transect E' on the uppermost part of the figure. For not overloading this part of the figure N and S could be moved downwards instead. In the caption it should read 'The restored parts comprise gravel bars....'

Fig. 5: On Fig. 5a I can see the thick black line which indicates the boundary between the clay and the gravel layer. Without it however I wouldn't be able to see that interface on this plot. The optical differences between strong and weak signals are a bit vague (see P 13, L 13). In Fig. 5a I also miss a colored bar which indicates the presented parameters like it is done in Fig. 5 b as resistivity.

Fig. 6: The box-plots aren't explicitly described in the caption or in the text. They describe daily variation, but what indicate the whiskers and the horizontal lines in the boxes. Furthermore are the dotted boxes just badly visible.

Fig. 7: The subplots should be better indicated with lower case letters (a), (b) and (c) likewise the other figures. The capital letters should be reserved for the transects in Fig. 2.

Fig. 8: (a) here are 'points' mentioned which aren't described in the text and also don't appear in the legend of the figure. The legend is not clear to me and misses units. (b) Its not clear for me what is meant with 'Downstream view'. (d) Are there 'simulated levels' visible on this graph?

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