Hydrology and
Earth System
Sciences

Open Access

Discussions

Interactive
Comment

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

A.-M. Kurth et al.

anne-marie.kurth@eawag.ch

Received and published: 2 March 2015

Dear Professor van de Giesen

Thank you for your interesting comments.

You will find the replies in the following:

Major comments

- The idea is very good. There are times when the temperature of the streambed and the stream are equal. However, it is impossible to determine whether this sameness is

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

due to infiltrating surface water or simply due to the cooling down of the streambed sediments to temperatures resembling the stream temperature. By comparing the cooling rates of cable sections with roughly the same temperature, e.g. in the range of 15.9 to 16.1 °C (close to the stream temperature), we can determine where – compared to cable sections with apparently similar environmental conditions – more or less surface water is infiltrating. By looking at the streambed temperature only this would be, unfortunately, impossible to determine.

Minor comments

Material and Methods

- This information will be included. - Yes, the DTS data from the AP Sensing DTS is, in spite of careful calibration (ice and hot water reference calibration baths, dispersion/slope/offset correction and post-measurement drift and offset correction), rather noisy. - The temperature was resolved to 0.1 °C only as the reference temperature sensors' temperature resolution used for calibration and offset correction is only 0.1 °C. - p. 1097 l 23: Of course not. The inelastic backscattering (Stokes and Anti-Stokes backscatter, Brillouin backscatter) causes a change in energy, the elastic backscattering (Rayleigh backscatter) does not. I think the "respectively" in the next sentence misled you, as it is wrong – and will be removed. - p. 1098 l 1: The Tyler reference will be added to support this statement. - p. 1098 l 16: The intention of this sentence was to show that in the investigated temperature range the temperature steps were 0.1 °C, i.e. the cable temperature was measured in steps 0.1 °C, i.e. 15.9 °C, 16.0 °C or 16.1 °C. - p. 1104 l 10: ok. Changes will be included as proposed. - p. 1105 l 16 – 20: The sentence will be split in two. - p. 1105 l 16 – 24: We'll try to be less enthusiastic about the results. J The sentence will be changed accordingly. - p. 1105 l 25 – 28: Ok. The statement will be deleted.

Discussion

- The active DTS results are discussed on page 1005, l. 8 – 15. We can only draw

conclusions on one gravel island as the fibre-optic cable was only installed in one gravel island (the other gravel islands are further upstream of the investigated reach of the stream). This will be added to the Material and Methods sections to avoid confusion.

Conclusion

- This will be added to the conclusions.

I hope to have answered all your questions. Thank you for taking the time to review our manuscript.

Best regards

Anne-Marie Kurth

⸻

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 1093, 2015.