

Interactive comment on “Toward a conceptual framework of hyporheic exchange across spatial scales” by Chiara Magliozzi et al.

Chiara Magliozzi et al.

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Dear Referee, Thank you for spending the time to review the manuscript and provide detailed feedback. We are glad that you liked the structured presentation of HEF drivers and can see their importance and relevance to environmental research and applications. We agree with the suggested revisions that you outlined in the specific comments section, and feel that added explanation and clarification in selected sections would help to improve the quality of our manuscript. Please find below a preliminary response to your main points. We agree with you that the concept of rivers continuously interacting with groundwater should be clarified to emphasize the impact of topography, at all scales, on spatial and temporal variations of groundwater flows. Therefore, we will discuss this aspect in Section 1 following lines 5-8 in page 2, by

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introducing that i) the differences in hydraulic potential created by topography drive groundwater flows (i.e. discharge patterns follow topographic lows) and ii) the relative importance of continental groundwater flows and local discharge areas on rivers would depend on both large- and small-scale topography as demonstrated by spectral analysis. Concerning the definition of hydrostatic and hydrodynamic head gradients around channel morphological elements, we agree that an additional explanation is needed to clarify the differences in this manuscript. We believe the best section to address this point in Section 4.1 where HEF is discussed at the scale of in-channel bedforms, and through cross-referencing the previous sections.

Finally, the conclusion section will include references to field applications (i.e. river restoration management) in order to highlight the need for a process-based understanding of river-groundwater interactions to river management.

Page 2, row 4: floodplain should be floodplain

Yes, we will correct it

Page 2, row 6: vertically and laterally (i.e. flood spates, overbank flows, etc.; (Minshall et al., 1985; Newbold et al., 1982, 1981), should be vertically and laterally i.e., flood spates, overbank flows, etc. (Minshall et al., 1985; Newbold et al., 1982, 1981);

Yes, we will correct it

Page 13, row 31: water consumption (i.e. ET) should be evapotranspiration (i.e. ET)

Yes, we will correct it

Page 16: row 25: ... strata Angermann et al., (2012). should be ... strata (Angermann et al., 2012).

Yes, we will correct it

A double check on the full document will also be performed.

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