

Interactive comment on “Opposite distribution pattern of streambed hydraulic conductivity in losing and gaining stream reaches” by X. H. Chen et al.

C. Kennedy (Referee)

casey.kennedy@ars.usda.gov

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The paper compares streambed K measured in both losing and gaining reaches of the Platte River. A systematic trend of lower K in losing streams (higher K in gaining stream) is observed and attributed to near-surface sediment clogging in losing streams. The research is well planned and executed. The readability of the paper could be improved; Susa's edits provide a solid start.

I agree with Susa that more information needs to be provided with respect to classification of losing vs. gaining streams. The authors use temperature differences between surface water and groundwater to distinguish losing vs. gaining for half of the sites; the

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remaining four sites were determined based on “geological and hydrological settings of the study sties (P1699, L15).”

Clearly, the authors recognize the significance of hydrogeological heterogeneities in these settings, especially for reaches separated by 100 km or more. So, is it possible that the observed variations in streambed K are more an artifact of differing parent geology and/or streambed erosion/deposition than groundwater-surface water exchange patterns? At a streambed site in a gaining stream, Genereux et al. (2008) proposed erosion and deposition events as a possible control for temporal variations in K of ~ 1 -40 m/day, a range similar to the one reported here and linked to sediment clogging. Alone, this may not explain the trend of increasing K with depth in the losing reaches, but differences in the character and rate of sediment deposition and broader evolution of the streambed may explain at least part of the variability in K between the two sets of study reaches.

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