# Review comments on "From precipitation to groundwater baseflow in a native prairie ecosystem: A regional study of the Konza LTER in the Flint Hills of Kansas, U.S.A." by Steward et al.

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The paper is generally well written and offers a useful case study of the hydrology of the Konza LTER. I consider the paper of interests to readers concerned with this particular area's ecosystem or similar ones elsewhere. The work is technically sound, although I am less certain of the validity of the calibrated stream resistances. In fact, I am a bit puzzled as to the methodology of the authors regarding the assessment of these streambed resistances. Unless I missed this in the paper, model calibration has been limited to comparisons with groundwater elevations in a set of monitoring wells and perhaps base flow at one stream gage at the outlet of the Konza LTER. Alternatively, calibration might have involved a set of stream gages distributed over the model domain, but those are not available I surmise. The authors point out that stream recharge ("enhanced recharge" in their paper) is very limited, which I take to mean that it also has a limited impact on groundwater elevations. Under these circumstances it seems difficult to calibrate for stream resistances, particularly when trying to distinguish between resistances of 10,000 days and 100,000 days. In both of these cases the streams have virtually no impact on the groundwater flow regime, even though their (very small) recharge to the groundwater differs by an order of magnitude, of course. This is confirmed in table 4, where the average differences in head errors (at monitoring wells) for these two resistance values is only 1 cm, not a very discriminating result. Also note, in the same table, that the average difference in error between c=100 days and c=1,000 days is also very small: 4 cm. These results were obtained by not only changing the stream resistances, but simultaneously also changing the hydraulic conductivities in each of the three zones in which they differ. I fear that the latter variations may have been more important (more impact) than the stream resistance values. The authors did compare the use of different streambed resistances with simulated base flow for the Konza LTER (Fig. 9) at one gage. Since the base flow changed it implies that the groundwater divide moved in response to varying stream resistances (stream recharge). Specifically, a larger stream resistance increases the groundwater elevations and with it the contributing watershed size. This could, in fact, offer a more sensitive calibration mechanism, but only if all stream resistances are changed in tandem (as they are – in fact all were assumed the same, I believe). In summary, I am a little suspicious as to the meaning of the stream resistance assessment in this modeling exercise. The assumption that all stream resistances are the same seems one of convenience rather than reality and may defeat the accuracy attempted with the automated calibration process (PEST). It would have been interesting to keep all hydraulic conductivities the same and then vary the stream resistances, just to see how they, *by themselves*, affect the modeling results.