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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Groundwater surface mapping informs sources of catchment baseflow" *by* J. F. Costelloe et al.

Anonymous Referee #2

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In this work the authors investigate the use of unconfined groundwater surface mapping to better constrain estimates of groundwater discharge to streamflow. In addition to groundwater surface mapping, the authors use traditional digital filters and tracers to estimate stream baseflow. The ease and simplicity of the groundwater surface mapping technique is very beneficial, and can provide a good first estimate of baseflow. This manuscript is well written; it is clear and concise. Most of my comments echo those of the previous reviewer, for example I question how well this method would work with fewer data points, and I also question why the authors didn't use heterogeneous subsurface properties provided they were present. A few additional comments are provided below:

1. Following the usefulness of this method with reduced data points, were any of the

kriging parameters varied to determine the uncertainty relative to these parameters?

2. Was any consideration given to whether the saturated areas fell in regions where surface water was present (i.e. within the streambed) given that these areas would vary with stream stage? For groundwater discharging to regions with little to no surface water present, was ET taken into consideration?

3. Both references used on page 12407 lines 4 & 10 were found to contain significant content that was improperly cited from other sources. It is recommended that the authors find the original sources of the information in this work and cite those instead.

4. Page 12419 Lines 7-10 are a little redundant.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 12405, 2014.