

Dear Dr de Rooij,

Thank you for your review of our reviewer responses. We have actioned our proposed changes/edits as per our outlined reviewer responses. With regards to your specific points:

- We have edited paragraph 3 of Section 1.3 in the Introduction to add preceding and subsequent sentences that clearly state the objectives of the study: *"This paper presents a high-level perceptualisation of inferred IGF for the purposes of rationalising the spatial development of catchment based hydrological conceptual modelling. **Quantifying the water balance using available national meteorological, hydrological, hydrogeological, geological and human influences datasets enabled us to develop a perceptual model of IGF**, where we have identified the location and direction of IGF at a high-level. Our perceptual model does not quantify the detailed specifics and directions of IGF, owing to the underlying information and analyses we have available. However, we can identify river reach lengths that have anomalous water balances that infer IGF processes are likely to be needed in the development of catchment based geospatial modelling environments, which is our core aim with this research."*
- Our new quantitative estimates of water balance errors support our qualitative analysis and methodological choices. Our ratio of qualitative to quantitative analysis reflects our overall aims and objectives of the study, whereby we infer where IGF processes are likely to be needed in the development of catchment based geospatial modelling environments. We have made these aims clearer throughout the paper in response to the reviewer comments.
- We feel that Intercatchment Groundwater Flow is an appropriate term to use to describe the groundwater water flux beneath topographic boundaries. The term has been used to refer to inter-**reach** fluxes in numerous similar papers (e.g. Le Moine et al., 2007; Bouaziz et al., 2018; Fan, 2019) and we feel its use would help our paper integrate with the existing literature.

We trust that the edits we have made address the comments and suggestions from you and our three reviewers. We look forward to hearing your response.

Regards,

Louisa Oldham