

Relevance of the uncertainty in evapotranspiration inferences for surface water balance projections in mountainous catchments

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Abstract The paper draws attention to the relevance of the predictive uncertainty in potential evapotranspiration (PET) calculations, towards improved surface water balance calculations in remote high-elevation catchments. The study is in two Andean catchments in Bolivia; the first is in the headers of the Amazon basin and the second is in the headers of the Uyuni basin. The common feature at both sites is the high altitudinal gradient. A semi-distributed water balance model and a Monte Carlo-based sensitivity analysis are employed in the study. In general, for a given modelling condition, results show that the sensitivity of the water balance to an imperfect measuring network is likely to induce uncertainty ranges as high as $53 \text{ L}^{-1} \text{ km}^2$. In addition, results have shown that the water balance in Andean mountainous systems under arid conditions is likely to be more sensitive to variations in the PET than their humid counterparts.

Key words tropical Andes; sensitivity analysis; surface water balance