Regionalization of Dynamic Watershed Response Behavior

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Abstract
Approaches to ungauged basin modeling typically use observable physical characteristics of watersheds (e.g. soils data) to directly infer hydrologic model parameters, or they use regionalization methods based on parsimonious hydrologic models. A different approach to streamflow prediction in ungauged basins is presented here where, instead of model parameters, the model independent hydrologic response behavior is estimated in the form of streamflow indices, and then regionalized with respect to physical characteristics of watersheds. Therefore, the approach uses a data driven regionalization method (under uncertainty) rather than the common hydrologic model driven regionalization method. Ensemble predictions in ungauged basins can then be constrained by limits on acceptable hydrologic model behavior. This study utilizes data from 30 watersheds in the UK. Initial results show that model predictive uncertainty of the model can be reduced considerably through this new approach.