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Hydrological Similarity and Consistently Wrong models

P.J. Smith (1) and K. Beven (1)

(1) Lancaster University, Lancaster Environment Centre, Lancaster, United Kingdom (p.j.smith@lancs.ac.uk), (2) Department of Earth Sciences, Geocentrum, Uppsala University, Uppsala, Sweden

Hydrological models are only approximations of real world system being investigated or forecast. They are typically driven by input data that may not be representative of the true forcing and is observational error. Performance is assessed against data that suffers from similar defects. Given this it is reasonable to question both the amount of information about my model contained in the data but also how the model and data can be related.

The method outlined in this poster attempts to balance the desire the desire to fit the observed data against the risk of over fitting. The method is motivated by the idea that in hydrologically similar situations the model residuals should be in some sense consistent. Assessment of this consistency is clouded by error sources outlined above. By using clustering techniques to relate the model states; which indicate hydrological similarity in terms of the model; observed data and the residuals of the model fit it is shown that useful measures of model performance can be derived. The use of these to explore the information content of differing time periods is outlined and the underlying assumptions critiqued.