



Equifinality: really a problem or looking at the wrong model results?

Victor Jetten, Dinand Alkema, Nguyen Thi hi Van, and Juan Sanchez

Faculty of Geoinformation Science and Earth Observation, University of Twente, The Netherlands

The common procedure for model calibration of models simulating with surface hydrology (runoff, flooding, sediment dynamics), is to look at aggregated outlet based data. This usually consists of one or more hydrographs, and/or sediment losses. Spatial model behaviour in event based models, is consistently ignored in literature where predictive power of such models is tested. This leads to conclusions such as: each rainfall events needs its own calibration set”, there is equifinality to such an extent as to make the model simulations impractical, it is impossible to find any logical behaviour, etc. We do not contest the theory of equifinality and will show examples different datasets lead to similar results. However, we hypothesize that it is as much a result of the choices made in output variables that are being looked at, as it is in uncertainty of the input variables of a model. We show examples of equifinality increasing with the level of aggregation of the results under review. In other words, while there is only one reality leading to a specific pattern of for instance runoff or flooding, there are multiple ways to generate a hydrograph from a catchment and many more ways to arrive at a discharge total. using a number of examples of runoff and flood modelling with openLISEM, we show that there is a need for different ways of testing model predictive quality, and that this can be obtained at least partly, by making use of “soft” data from interviews with stakeholders.