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Impact of spatial data resolution on scenario calculations using different spatially distributed models

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Distributed and regional scale hydrological modelling requires the use different standard data sets such as digital elevation model, soil map and land use classification. Application of process based models across scales often requires the use of aggregated data sets or data sets of increased scale with reduced information content. Mostly these available spatial data sets are also used for model parameterisation. E.g. pedotransfer functions and tabular values therefore are used and translated into spatially distributed fields of model parameters. As data availability differs in different regions of the world, the question arises how increasing grid size and therefore decreasing data availability influences the quality of simulation results. This contribution will present results of land use scenario calculations based on differently resolved spatial data sets. A data set of 25m resolution of the mesoscale Dill catchment (693 km2, situated in central Germany) was aggregated systematically up to 2km and used for water balance simulations as well as scenario analyses. Three spatially distributed models thereby were applied to analyse the impact of data aggregation on simulated water fluxes: WASIM-ETH, SWAT and TOPLATS model. This investigation reveals the effect of increasing grid size on simulation results via the use of stepwise aggregated data. It is shown that the different models react differently robust with respect to data aggregation. While WASIM-ETH and TOPLATS simulate constant results for grid sizes from 50m to 500m, SWAT seems to react most sensitive on input data aggregation delivering constant water balances between 50m and 200m grid size. This presentation will show that different catchment models which are used for scenario analysis react sen-

sitively on data aggregation and show different sensitivities. Therefore model specific thresholds on grid size need to be defined.