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Input data influence on modeling accuracy of a typical agricultural watershed

Summary

Water is a very important factor in natural environment as well as in many kinds of human activity like agriculture and industry. There are significant water deficiency in many areas in Poland and in the whole world, therefore taking care of water resources by reasonable and concious management is very important. Models are excellent tools for this purpose but to provide users with useful information, the accuracy and certainty of modeling results have to be specified. To meet this requirements research of input data influence on modeling accuracy of an agricultural watershed was undertaken. Because Digital Elevation Model is one of the most important data types used for watershed modeling it was chosen for the analysis.

The influence of detail level of digital elevation model for accuracy of listed model watershed elements was analyzed: watershed delineation, subbasins and stretches of river parameters, as well as modeled flowout, ground water content and evapotranspiration.

According to research results the influence of DEM on evapotranspiration is the smallest but there is a significant influence on the rest of watershed parameters. In general the higher the detail level, the higher is the accuracy of watershed modeling. Pictures show these relationships as well as deviations from them. Further research are needed to find causes of these deviations and to develop procedure or new indicator for assessment of DEM usefulness for typical agricultural watershed modeling.