



Cross-country transferability of multi-variable damage models

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Flood damage assessment is often done with simple damage curves based only on flood water depth. Additionally, damage models are often transferred in space and time, e.g. from region to region or from one flood event to another. Validation has shown that depth-damage curve estimates are associated with high uncertainties, particularly when applied in regions outside the area where the data for curve development was collected. Recently, progress has been made with multi-variable damage models created with data-mining techniques, i.e. Bayesian Networks and random forest. However, it is still unknown to what extent and under which conditions model transfers are possible and reliable. Model validations in different countries will provide valuable insights into the transferability of multi-variable damage models. In this study we compare multi-variable models developed on basis of flood damage datasets from Germany as well as from The Netherlands. Data from several German floods was collected using computer aided telephone interviews. Data from the 1993 Meuse flood in the Netherlands is available, based on compensations paid by the government. The Bayesian network and random forest based models are applied and validated in both countries on basis of the individual datasets. A major challenge was the harmonization of the variables between both datasets due to factors like differences in variable definitions, and regional and temporal differences in flood hazard and exposure characteristics. Results of model validations and comparisons in both countries are discussed, particularly in respect to encountered challenges and possible solutions for an improvement of model transferability.