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Evaluation of discharges in Rhine basin calculated from various historical precipitation datasets

Martin Kadlec (1), Yi He (2), Desmond Manful (2), Ladislav Palán (1), Hilke S. Lentink (3), Lisa-Ann Quandt (3), and Joaquim G. Pinto (3)

(1) Impact Forecasting, Aon Benfield, Prague, Czech Republic, (2) Tyndall Centre for Climate Change Research, University of East Anglia, Norwich, United Kingdom, (3) Institute of Meteorology and Climate Research, Karlsruhe Institute of Technology, Karlsruhe, Germany

Aon Benfield's catastrophe development unit Impact Forecasting is developing in collaboration with University of East Anglia (UEA) and Karlsruhe Institute of Technology (KIT) a pan-European flood event set which will link together all its country based catastrophe flood models used in re/insurance industry. The event set will be based on long time series (several thousands years) of simulated precipitation and temperature fields over Europe generated by KIT from MPI-ESM GCM and dynamically downscaled to 25 km using COSMO-CLM regional climate model. This data is used as an input for the bespoke rainfall-runoff model developed by UEA (based on HBV) to calculate time series of discharges and identify flood events. To evaluate the effect of some uncertainties in the whole process, we calculate discharges from COSMO-CLM precipitation datasets using historical datasets (reanalysis) as boundary condition instead of GCM. Three different reanalysis are used as boundary data: ERA-Interim, ERA-20C and NCEP 20CR. We also evaluate the effect of various bias correction methods on the discharges. Discharges calculated from various cases (reanalysis and bias correction methods) are then compared to the observed discharges at gauging stations in the mid and lower Rhine basin.