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Regional analysis of the mean annual maximum peak flow in South West Europe

Thomas Kjeldsen and David Cooper
Centre for Ecology & Hydrology, Wallingford, United Kingdom (trkj@ceh.ac.uk)

The work reported here is a pilot study carried out as part of the EU FP7 project Mirage, and aims to derive flood frequency relationships for temporary rivers in the Mediterranean region. Regional studies of flood characteristics are often limited to national, or even sub-national, regions. Reasons for these spatially limited studies are manifold, but include: lack of international co-operation, difficulties in getting access to hydrometric data from other countries, and inconsistencies in national datasets for deriving catchment characteristics. As part of this study, preliminary regional datasets from south-west Europe of flood statistics and relevant catchment descriptors have been derived. The annual maximum peak flow data have been obtained from the UNESCO/FRIEND project and includes 381 time series of daily river flow from Portugal, Spain and southern France. Note that a majority of these data comes from perennial rivers. The catchment descriptors including catchment area, mean annual rainfall, soil properties and land-use characteristics. These characteristics have been derived from pan-European dataset including the SRTM (90m) dtm, gridded precipitation data from CRU (18km), the JRC soil database (1km) and CORINE land-cover data (250m). The logarithm of the mean annual maximum peak flow (QBAR) has been linked to a subset of log-transformed catchment descriptors using a linear regression-type model, including correlation in both observations and regression model errors. The existence of model error correlation suggests that the data contains more between-catchment variation in QBAR than can be explained by the catchment descriptors alone. Thus, further research is needed to identify additional explanatory variables with the potential to be made available on a pan-European scale.