



Extreme value analysis of the discharges in the Danube lower basin with covariates NAO and low frequency components of the atmospheric circulation over Europe

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The daily discharge time series in the lower Danube basin have been considered for the 1900-2005 period. Orsova station, situated in the south-western part of Romania, was considered as representative in this analysis. Two methods are applied for fitting the data to an extreme - value distribution: block maxima and peaks over thresholds (POT). In the analysis by Generalized Pareto Distribution (GPD) an optimum threshold of 10000 mc/s has been found. Using block maxima approach associated with the use of the generalized extreme value (GEV) distribution, the annual and spring (March, April, May and June) maxima of daily discharge for 1900-2005 have been analyzed, as well as the monthly maxima of daily discharge for the 1958-2001 period. The period 1958-2001 has been chosen for the association with atmospheric circulation over Europe described by three fields: Sea level pressure (SLP), 500-1000 hPa thickness and 500 hPa geopotential (ERA-40). As regards the introduction NAO as covariate in the GEV distribution parameters, the best result has been got by incorporating NAO from DJFM in location parameter of GEV for the daily maximum discharge levels during spring and early summer months (March, April, May and June). In order to see the influence of the atmospheric circulation over the Atlantic-European region, first of all, the atmospheric circulation was fitted to the low frequency components of the decomposition in Multivariate Empirical Orthogonal Function (MEOF). The 10 MEOF components explain 82 % from the total variance of the three fields considered. The atmospheric circulation influence was tested through incorporating in the GEV distribution parameters of the first 10 PCs of the MEOF decomposition simultaneously and with different month lags. The model presented the most significant

improvement through introducing in the location parameter the first 10 MEOF's PCs of the atmospheric fields considered with one month prior to the occurrence of the maximum values in the discharge time series.