Present thesis deals with the multivariate extreme value theory. First, concepts of modelling block maxima and threshold excesses in the univariate case are reviewed. In the multivariate setting the point process approach is chosen to model dependence. The dependence structure of multivariate extremes is provided

by a spectral measure or an exponent function. Models for asymptotically dependent variables are provided. A construction principle from Ballani and Schlather (2011) is discussed. Based on this discussion the pairwise beta model introduced by Cooley et al. (2010) is modified to provide higher flexibility. Models

are applied to data from nine hydrological stations from northern Moravia previously analysed by Jarušková (2009). Usage of the new pairwise beta model is justified as it brought a substantial improvement of log-likelihood. Models are also compared with Bayesian model selection introduced by Sabourin et al. (2013).