



Flood Change Assessment and Attribution in Austrian alpine Basins

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The present paper aims to investigate the sensitivity of flood peaks to global warming in the Austrian alpine basins. A group of 97 Austrian watersheds, with areas ranging from 14 to 6000 km² and with average elevation ranging from 1000 to 2900 m a.s.l. have been considered. Annual maximum floods are available for the basins from 1890 to 2007 with two densities of observation. In a first period, until 1950, an average of 42 records of flood peaks are available. From 1951 to 2007 the density of observation increases to an average amount of contemporary peaks of 85. This information is very important with reference to the statistical tools used for the empirical assessment of change over time, that is linear quantile regressions. Application of this tool to the data set unveils trends in extreme events, confirmed by statistical testing, for the 0.75 and 0.95 empirical quantiles. All applications are made with specific (discharges/area) values. Similarly of what done in a previous approach, multiple quantile regressions have also been applied, confirming the presence of trends even when the possible interference of the specific discharge and morphoclimatic parameters (i.e. mean elevation and catchment area). Application of a geomorphoclimatic model by Allamano et al (2009) can allow to mimic to which extent the empirically available increase in air temperature and annual rainfall can justify the attribution of change derived by the empirical statistical tools. An comparison with data from Swiss alpine basins treated in a previous paper is finally undertaken.