Geophysical Research Abstracts, Vol. 7, 08948, 2005
SRef-ID: 1607-7962/gra/EGU05-A-08948

What are suitable catchment attributes for regionalising floods?

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We compare the predictive performance of various methods of regionalising flood peaks for the ungauged catchment case. We use a jack-knifing comparison of locally estimated and regionalised flood quantiles for about 500 Austrian catchments. The methods that only use catchment attributes such as geology, soils data, land use and mean annual rainfall perform poorer than those based on spatial proximity. These catchment attributes represent processes that vary over long time scales and we hence denote them as static catchment attributes. To improve over these static attributes we are proposing a number of dynamic catchment attributes. The first of these attributes is derived from event runoff coefficients. These are estimated from observed streamflow data for 50000 runoff events in Austria. Other dynamic attributes are measures of the average time of concentration and the ratio of base flow and runoff each of them regionalised to ungauged catchments. Use of these dynamic catchment attributes significantly improves the performance of the flood regionalisation. We therefore suggest to use dynamic catchment measures as predictive variables in addition to traditional attributes to make headway in regionalising flood frequency estimates.