A statistical study of drought characteristics of the Pearl River Basin, China

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Being the third largest river system and the fastest developing region in China, Pearl River Basin has experienced drastic environmental changes in the last few decades. It has become increasingly difficult to balance the different, often conflicting, interests regarding the management of available water resources. These conflicts are especially noticeable during severe and extensive droughts. The objective of this study is to analyse the large-scale spatial variability of drought characteristics in the region. The truncation (threshold) level approach which defines droughts as periods during which the streamflow is below a certain truncation level is adopted in this study. This drought definition enables a quantitative analysis of streamflow data. 38 daily streamflow series which are more or less undisturbed by anthropogenic activities from the period 1959-1984 are used. The truncation level is determined based on the analysis of respective flow duration curves. To reduce the effect of the presence of minor droughts and dependency among droughts, a moving average procedure has been employed for smoothing of the streamflow series before the selection of appropriate drought events. Partial duration series (PDS) is compiled accordingly and drought duration is the primary focus of the study. By comparing the PDSs, underlying spatial patterns can be revealed and such information is useful for regional resource planning and management.