

# **Probabilistic evaluation of territory situation using historical precipitation data**

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The paper deals with an application of a historical precipitation data for a probabilistic evaluation of climatic changes and other landscape changes in Jeseníky territory in the Czech Republic.

A simulation of rainfall-runoff relationships represents a basic instrument for forecasting future runoff. The prediction of a course and rainfall intensity, flow regime and their impact on the development of high flood situations are frequent problems nowadays. During last years extreme rainfall-runoff events were recorded not only in the Czech Republic.

A classical method for rainfall-runoff modelling is based on short-term forecasting of meteorological situation. This method is restricted to an interval of only few days. In addition to the short term forecasting another method suitable for long-term forecasting of runoff conditions exists. Such method is founded on the statistical processing of time series and probabilistic evaluation of expected characteristics (especially runoff and rainfall characteristics). Bayesian analysis of the time series represents the core of this probabilistic evaluation. Necessary conditions for statistical and probabilistic evaluation can be found in the data analysis from historical periods. It is also necessary to exclude problematic measurements and make a segmentation of time series according to a steady watershed conditions. Using historical data is directed towards the following three objectives. It aims at reconstructing temporal and spatial patterns of weather and climate. It investigates a vulnerability of communities and economies to climate variations, climate extremes and natural disasters. It explores past discourses and the social representations of the climate.

The pilot project is conducted on a small watershed where there are distinctive changes in the river-basin. The Jeseníky mountains were selected as a pilot site. This area is characterized by impacts of inappropriate human interventions into the hydrological regime, dramatic deforestation, large-scale amelioration and de-watering, interventions into vegetation and inappropriate adaptation of basins of local streams. This area is often affected by local rainstorms and high floods.

Rainfall data can be used simultaneously as input to the rainfall-runoff models. These models should evaluate the impact of historical rainfall to the current runoff conditions and be used for long-term probabilistic prediction.