



Change climate impact in hydrological events in Dobrogea region

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The main objective of this study is to assess the impacts of climate change on the river flow regime of the river of the Dobrogea region and possible consequences for the water works. The impact of climate change on hydrology is difficult to determine because the hydrological records are influenced by the human activity. Generally, two methods are used for describing the impact of climate change: (i) the analysis of observed data and (ii) scenario calculation using the hydrological model. In this study we chose the first method and will analyze a time series of observed data to detect changes and trends. Analysis methods will be applied to the Taita catchment, the most important fluvial system in Dobrogea region.

Dobrogea region is situated in the South-Eastern part of Romania between the lower Danube and Black Sea. This region is characterized by the existence of two climate units: (i) a western unit (unit I) where the climate is continental and influenced by the Black Sea (the mean annual temperature is about 11°C and the precipitation is 400 mm) and (ii) an eastern unit (unit II) while the climate is influenced by the moderate continental belt. In a recent study (Maftai C., Bărbulescu A., 2008) we demonstrated an increasing trend of the mean annual temperature evolution over the area studied. After 1997 the mean annual temperature increases with 0.8°C, fact that is in concordance with the estimation made for Europe. In another study (Maftai C., et al., 2011) we observed: (i) in the climatic unit II, after 1995, the mean annual precipitation increased with 82.8 mm, (ii) in the climatic unit I (without Jurilovca and Sulina station) the mean annual precipitation increased with 98 mm, but, unfortunately, the precipitation distribution in time is not uniform.

The Taita catchment area is 591 km². Taita has an asymmetrical catchment, with a 0.28 coefficient of asymmetry, well developed on the left, which is where most of the confluent come from. Precipitations are one of the main sources of supply of this river – 74%, compared to the subterranean supply – 24%. From the total of 591 km², the surfaces arranged with various water works sum up to 0.18 km².

The methodology presented in this study consists of an analysis of the temporal characteristics and the identification of the discontinuities in flow time series. In order to determine the discontinuities in flow regime, some homogeneity and break test are performed.