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The assessment of the surface water resources for the Buzau and Ialomita river basins from Romania under the climate change impact by statistical analysis

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A coupling of a three meteorological models and a hydrological conceptual model was used in order to estimate the impact of the climatic changes on the hydrological resources in a two river basins of Romania.

The analysed Buzau and Ialomita river basins covering an area of 14392 km^2 are located of the outside of Curvature of the Carpathian Mountains. Due to a very high variability of weather conditions, droughts as well as excessive humidity periods occur during the year.

Water balance modelling with regard to climate change scenarios can give substantial information on changes in the hydrological situation in the future. Water-balance models are especially useful for identifying the regional hydrologic consequences of changes in temperature, precipitation, and other climatic variables.

Monthly data series on the period from 1971 till 2000 have been used for calibration of the WatBal hydrological model in the local conditions of analysed areas.

The values of the modification of the air temperature and precipitation, for the reference years of 2025, 2050 and 2100 were determined with the regional climate models: ECHAM3/OPYC4, HadCM3 and NCAR-PCM. These models have been used recently to examine climate variations at scales that are not resolved by global models. To the extent that they produce realistic climate simulations, such a models can be a powerful tool in the study of regional climate impacts.

Then, a statistical analysis of the changes in the river flow regime (the monthly flow distribution during the year) has been performed. In the case of both climatic scenarios considered (actual regime and modified regime), the distribution in time and the frequency and duration curves of the monthly mean flow ware taken into consideration. The analysis of the variability of differences between the seasonal flows under the circumstances of both climatic scenarios was also accomplished.