



Surface water balance components in Croatia

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Using the Palmer method on a thirty-year continuous series of meteorological data from 82 stations (temperature, precipitation and relative humidity) and taking the soil data into account, we determine the monthly mean water balance components in Croatia. Water balance components are: potential evapotranspiration (PET), evapotranspiration (ET), soil water reserve (S), runoff (RO), recharge (R) and soil moisture loss (L). Evapotranspiration is the process that consists of evaporation from the soil (evaporation) and from animals and plants (transpiration). Water balance components, although largely dependent on climatic elements, also depend on geographical position and geological substrate. If there were enough precipitation, the maximum of evapotranspiration would be in the mid-Adriatic area, but the lack of precipitation makes that evapotranspiration not different from the values in other parts of Croatia. Runoff is greatest in areas with high precipitation and that is in the mountainous part of Croatia. Analyzed meteorological data from the period 1981–2010 indicate higher air temperature and lesser precipitation than from the standard climate period 1961–1990; this adversely affects the evapotranspiration in areas with insufficient precipitation, i.e. at the Adriatic coast and its many islands, and the eastern part of Croatia. For cities or towns of Osijek, Zagreb, Crikvenica, Gospic and Hvar, which have 109-year data, secular trend of water balance components is tested by Mann-Kendall rank test. Results for mean annual values show significant increase in temperature and potential evapotranspiration and decrease in precipitation, relative humidity, runoff and soil water reserve at all stations.