

## **Hydrological studies in experimental and representative basins in Pernambuco State, Brazil**

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**Abstract** Hydrological studies in experimental and representative basins are of fundamental importance for water resources management. This paper presents some activities of hydrological research in experimental and representative basins of the State of Pernambuco, Brazil. The study areas are located at Tapacurá and Mundaú representative basins and at the Gameleira experimental basin, and in experimental plots in Pajeú basin. In the Tapacurá basin, three studies were performed: (1) different monthly coefficients “k” of the Thornthwaite method were tested to calculate the effective temperature and, consequently, the reference evapotranspiration, giving rise to the method identified as Modified Thornthwaite; (2) the spatial variability of the retention curve and hydraulic conductivity parameters were analysed using the Beerkan method; (3) changes in vegetation cover were evaluated through the NDVI and NDWI indexes using TM–Landsat 5 images. In the Mundaú representative basin, the performance of different evapotranspiration methods was evaluated and compared to the FAO standard method, Penman-Monteith. In the Pajeú basin, the experimental plot is covered by pasture and sensors were installed to monitor the following variables: rainfall, air temperature, the energy balance components (net radiation, latent and sensible heat, and soil heat flux), wind velocity and CO<sub>2</sub> flux into atmosphere, soil moisture and runoff.

**Key words:** Beerkan, evapotranspiration, water balance, energy balance, CO<sub>2</sub> flow