



## **Identification of the relationship between meteorological and hydrological drought**

A. Loukas (1) and L. Vasiliades (2)

(1) Department of Civil Engineering, (2) Department of Management of Environment and Natural Resources, University of Thessaly (aloukas@uth.gr /Fax: +302421093253)

This study evaluates the relationship between meteorological and hydrological drought in selected small, medium and large watersheds in the region of Thessaly, Greece. Thessaly is an agricultural plain region surrounded by mountains and is traversed by Pinios River, and its total area is about 13500 Km<sup>2</sup>. The Standardized Precipitation Index (SPI) was used as an indicator of meteorological drought severity at multiple time scales. Monthly precipitation data for the period 1960-2002 were used for estimation of the basin-wide precipitation by the Thiessen polygon method adjusted for the mean elevation of the study watersheds. Most of the study watersheds have intermittent runoff data. For this reason several methods were applied for the extension and reconstruction of the runoff database for the period 1960-2002. The synthetic runoff timeseries were statistically validated with the observed runoff data and used for the estimation of hydrological drought. The synthetic runoff was normalized through Box-Cox transformation and standardized to the mean runoff. The standardized runoff timeseries were used as an indicator of hydrological drought severity and were compared with the multiple time scale SPI timeseries for the study watersheds. The results showed that SPI at small time scales is a good indicator of hydrological drought in small watersheds, whereas large time scale SPI values display better the hydrological drought for large watersheds with diverse runoff generation mechanisms.