Abstract

Chronological series of monthly and annual precipitation data recorded in Gabes Watershed, south-eastern Tunisia, were analyzed. The study is based on the standardized precipitation index (SPI) values, computed for 10 rainfall stations over the period 1987–2012, which corresponds to an observatory period of 25 hydrologic years (from September to August). The results obtained show a great variability in SPI values. The historical evolution of the SPI made it possible to define the periods of excess and deficit, corresponding to wet and dry periods respectively. The wet years were found to be 1989–1990, 1995–1996 and 2006–2007 while the dry years were 1987–1988, 1996–1997, 2000–2001, 2001–2002, 2007–2008, 2008–2009 and 2009–2010. This clearly shows alternating wet and dry periods, but with drought episodes taking prevalence over rainy fronts throughout the study period. Indeed, a high tendency towards a drop in precipitation and important sequences of drought were observed. Spatial variability of drought throughout Gabes Watershed was examined by geostatistical analysis of SPI, as drought and rainfall distribution vary with latitude, longitude, topography and proximity to the Mediterranean Sea. The results obtained showed that, compared to coastal and southern areas, drought was observed to be more important in the West and the North of Gabes Watershed. The SPI showed that moderate droughts are generally more frequent than severe or extreme droughts in most of the Watershed.

Key words: drought, geostatistics, precipitation, standardized precipitation index, trend analysis, Tunisia