Geophysical Research Abstracts
Vol. 14, EGU2012-2295-1, 2012
EGU General Assembly 2012

Analysis of extreme dry and wet periods in Belgrade using the Standardized Precipitation Index

M. Unkasevic and I. Tosic
University of Belgrade, Dept. of Meteorology, Belgrade, Serbia (miroslava@ff.bg.ac.rs)

The analysis of dryness and wetness in Belgrade from 1949 to 2011 is based on the Standardized Precipitation Index (SPI). The SPI was designed to quantify the precipitation deficit for multiple time scales (McKee et al. 1993). Because of its characteristics, the SPI can also be used as a tool to monitor wetter-than-normal conditions. It is widely used because it allows a reliable and relatively easy comparison between different locations and climates.
In this study the SPI was calculated on 1 and 12-month time scales, which correspond to the past 1 and 12 months of observed precipitation totals, respectively. These time scales reflect the soil moisture conditions (small time scale) or the underground waters, river flows and lake water levels (large time scales). The precipitation data were adjusted on the two-parameter gamma distribution, and subsequently they were normalized. Thus, the normalized SPI values represent in the same way wet and dry conditions. A very large positive (greater than 2) or negative (less than -2) SPI describes an extremely wet or dry event.
The study of the time series of the SPI values on a 12-months time scale, showed the predominance of wet conditions from 1952 until 1956, 1968 to 1982 and from 2005 to 2011. Drier conditions than the normal were from 1957 to 1964 and from 1983 to 1993. Extremely dry was in 2000-2001 with the SPI value less than -3.0.
Based on the SPI1 values, extremely dry was recorded in December (-3.3) of 1972 and October (-3.8) of 1995. The largest SPI1 value occurred in July (3.1) of 1999. In addition, extremely wet (SPI1 about 2.2) was in June and October of 1974. The meteorological drought magnitude at the 1-month timescale had a magnitude greater than at the 12-month timescales. The SPI1 values better illustrated the onset of the dry and wet periods and their progression through time than the SPI12 ones.

McKee, T. B., N. J. Doesken, J. Kleist (1993) The relationship of drought frequency and duration to time scales. Preprints, Eighth Conf. on Applied Climatology, Anaheim, CA, Amer. Meteor. Soc., 179–184