



Meteorological drought patterns and climate change for the island of Crete

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A new index, named SN-SPI (Spatially Normalized-Standardized Precipitation Index), has been developed for assessing meteorological droughts. The SN-SPI is a variant index to SPI (Standardized Precipitation Index) and is based on the probability of precipitation at different time scales, but it is spatially normalized for improved assessment of drought severity. Results of this index incorporate the spatial distribution of precipitation and produces improved drought warnings. This index is applied in the island of Crete (Greece) and the drought results are compared to the ones of SPI. A 30-year long average monthly precipitation dataset from 130 watersheds of the island is used by the above indices for drought classification in terms of its duration and intensity. Bias adjusted monthly precipitation estimates from REMO regional climate model used to quantify the influence of global warming to drought conditions over the period 2010 – 2100. Results based on both indices from 3 basins in west, central and east part of the island show that: a) the extreme drought periods are the same (5%-7% of time) but the intensities based on SN-SPI are lower, b) the area covered by extreme droughts is 25% and 80% based on the SN-SPI and SPI respectively, c) more than half of the area of Crete is experiencing drought conditions during 46% of the 1973-2004 period and 7%, 63% and 92% for 2010-2040, 2040-2070 and 2070-2100 respectively and d) extremely dry conditions will cover 5% of the island for the future 90-year period.