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The effect of spatio-temporal precipitation distribution on droughts in the island of Crete

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Monthly precipitation records from 56 stations in the island of Crete (Greece) revealed that areal mean precipitation is of strong orographic type and its magnitude decreases in West-East direction by as much as 400 mm on average. Both elevation and longitude, parameters that influence precipitation, were the most important and provided the highest spatial correlation. It was found that during a dry year the precipitation shortage is greater at high elevations while the precipitation excess during a wet year is greater in the western part of the island due to strong orographic effect and NW and SW dominant directions of cyclonic systems. The spatial and temporal drought distribution for the period 1974-2005 was analyzed by using the Standardized Precipitation Index (SPI). The analysis showed that severe droughts occurred around the year 1992-1993, with a range of up to 3 years with higher intensity in the SE part of the island that also faces an additional 3-year mild drought during the period 2000-2003. These findings will assist in a better strategy towards sustainable water resources management especially in long dry periods.