



Regional Analysis of Precipitation at the Valencia and the Alacant Anchor Stations Reference Areas by Means of the Standard Precipitation Index

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The behaviour and dimensionality of precipitation in the Mediterranean Region determine, in a very significant way, different aspects such as agricultural development, availability of water resources, drought monitoring, etc. Using only this parameter and defining what is known as the *Standardized Precipitation Index* (SPI), it has been shown that this index is very useful for the study of the climatology of dry and/or wet events and, therefore, it is of high value for the identification and monitoring of climatic droughts.

This study shows an analysis of SPI on two semi-arid areas of the *Autonomous Region of Valencia* (Spain) which are exposed to undergoing periods of drought. They are the *Valencia Anchor Station* (VAS) area which is placed over the natural region of the *Utiel-Requena Plateau* (west of the province of Valencia), and the *Alacant Anchor Station* (AAS) area which is placed over the natural region of the *Vinalopó Mitjà* (west of the province of Alicante). Both stations, separated a distance of about 150 km, are actually twin stations, their representative areas have similar land use and soil types, which allows to consider similar anthropogenic impacts, but they are located in two different climatic zones: the average annual precipitation is about 450 mm in the *Valencia Anchor Station* area and about 250 mm in the *Alacant Anchor Station* one. The latter is considered to be the agricultural area objectively most degraded of the *Valencia Autonomous Region*, of problematic sustainability and easily vulnerable from the viewpoint of water resources. The parallelism between both *Anchor Stations* and the fact that one of them is under water-stressing conditions, make it appropriate to define a *Water Cycle Observatory* to study the variations of the climatic and hydrological conditions by studying and comparing meteorological parameters and surface fluxes of radiation, energy and water between both *Anchor Station* areas.

Monthly series of precipitation data have been generated for 77 rain gauges collected from 1971 to 2006 by the Spanish Agency for Meteorology (AEMet). The temporal gaps were completed using multiple linear regressions and the homogeneity of each time series was checked through *Run* and *Von Neumann* tests. Then, multivariate statistical methods such as Principal Component Analysis (PCA) and Cluster Analysis have been used on SPI values at short time scales. The results of these tests represent a valuable characterization of both *Anchor Station* areas which are used for the validation of remote sensing data and products, concluding that there exist homogeneous regions with similar pattern behaviours associated to typical meteorological phenomena in the Mediterranean climate.