

# Clustering techniques analysing the variability of rainfall distribution patterns in the South of Portugal

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## INTRODUCTION

One of the main characteristics of the climate in South of Portugal is the irregular distribution of rainfalls and its high variability from year to year, which makes it difficult to know if the pattern of the rainfall is changing. In a climate change scenario it is expected that this region will suffer from higher temperature, less total rainfall and more intense periods of rain in other seasons, so we intended to seek for some clues in the historic data that the climate is already showing some trends towards the climate change scenarios.

Several techniques, from comparison with the values corresponding to percentile ranged from 0.1 to 0.9, moving average and cluster analysis, were applied to the annual rainfall and fall, winter and spring rainfall seasons, in order to detect changes in the distribution pattern and evaluate the variability of dry and wet period over time. The study was performed using monthly data from thirty rainfall stations in the two major river basins of South of Portugal: the Sado and the Guadiana Basin. This area has a Mediterranean climate with the rainfall concentrated in the winter, fall and spring and with a very dry and hot summer.

This paper presents the methodology and the results of the techniques applied to a single rainfall station – Portel Station.

## MATERIAL AND METHODS

### Rainfall data set

The rainfall data cover the all Alentejo area. Data from these stations are available since 1931 and consistency analyses of the data were made. In table 1 a rainfall characterization for all the stations is made and are also presented the Portel Station features.