Using data-mining techniques for monitoring climatic variations. Application to drought.

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The study of climatic variations in areas with drought problems have been very important in recent years. Mainly because the drought affects many economic and social sectors, from agricultural to transportation, going through urban water deficit and the development of modern industries. Due to these problems and drought geographical and temporal distribution it's difficult to find a single definition of drought. Improving the understanding of the between synoptic patterns and climatic index is necessary to reduce the impacts of drought. Data-mining is a technique that it can be used to interact with large databases and to help in the discovery relations between parameters by extracting information from massive and multiple data archives. We use OLAP-Mining techniques to discovery of association rules between synoptic patterns and climatic index. First we compare this methodology with traditional statistical methods used from 1971 to 2006 in the Southeast of Spain. In second place, we extend this methodology to different climatic areas in the Iberian Peninsula. We use different parameters for evaluating dryness temporal periods, on the one hand, we use the precipitation, temperature, sea surface temperature and soil moisture; on the other hand, we use Standarized Precipitacion Index (SPI) that it has been used amply in the bibliography. Time series Data-Mining techniques organize data as a sequence of events, with each event having a time of recurrence. To cluster the data into groups of records or cluster with similar characteristics. We find relationship between different kind of weather, dryness and sea surface temperature for several temporal periods. We will have the first results about the inclusion of stationary oceanic parameters for example, SOI and NAO.