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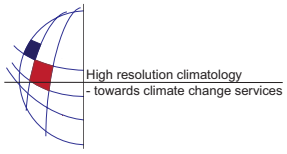

Atmospheric and oceanic influences on the winter and spring Miño river flow

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We examine the climatic mechanisms associated to Miño streamflow anomalies during winter and spring, exploring the relationships between the streamflow and several atmospheric teleconnections patterns and seasonal sea level pressure and sea surface temperature (SST) for the previous and simultaneous seasons.
The Miño river basin is located in the Northwestern Iberian Peninsula. It covers a limited territory, bordered by the Atlantic Ocean and Cantabric Sea. The data base of streamflows comprises montlhy data form 19 stations, covering the period from October 1956 to September 2007. We have performed a Principal Component Analysis of these monthly data, finding only one significant PC with a associated variance of 86%.
Following the approach adopted by other authors, in a first step we try to identify teleconnections patterns and sectors of oceanic SST and SLP anomalies that can be related with Miño's river flow. In order to do that we have evaluated the point linear correlation between the winter and spring streamflow PC series and the teleconnections indices, the Northern Hemisphere SLP and the global SST anomalies from simultaneous previous seasons. Teleconnections and regions showing significant correlations are identified as potential explanatory mechanisms, or even predictors. The second step is to identify, among these selected teleconnections and regions, those that can be considered as stable. This is achieved through the analysis of the variability of the correlation between winter and spring Miño flow anomalies and potential explanatory variables using a moving window of 20 years.
The correlation is considered to be stable for those regions where spring streamflow and explanatory variables are significantly correlated at 90% level (r = 0.36) for more than 80% of the 20-year windows covering the period 1956-2007 and, furthermore, that the sign of the correlation does not change with time. Teleconnections and regions verifying this criterion are considered as robust explanatory variables and predictors, which could be used in a multiple linear regression model for the Miño streamflow.
The preliminary results show that winter Miño streamflow are more dominated by contemporary NAO, EA, and SCA teleconnections and also by the SLP anomalies over Iberian and Scandinavian Peninsula and Northeastern Canada. On the other hand, for the spring stream flow, there is also a remarkable influence of the contemporary SCA, but also an influence on previous winter SLP anomalies on the Northeastern Canada and with previous winter SST anomalies of the region El Niño3. These variables will be used as explanatory variables for the spring Miño river flow in a model based on linear regression.

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