



Influence of North Atlantic teleconnection patterns on winter rainfall in Galicia (NW Spain)

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Galicia is located in the northwestern corner of the Iberian Peninsula, between $42^{\circ}N$ and $44^{\circ}N$. In this area it is submitted to the Atlantic weather systems and also to continental influences, having a high percentage of rainy days. Although the atmosphere can be considered at certain scales as a chaotic system, as reflect of its internal dynamics some large-scale patterns arise, characterized by the so-called teleconnection indices. In the Atlantic area of the North Hemisphere, NAO (North Atlantic Oscillation) is the dominant pattern of atmospheric circulation variability, although Galicia is near the transition area where NAO influences changes its sign. For this reason to characterize atmospheric variability it is necessary to take into account other patterns appearing in this area. These patterns are: EA (East Atlantic), EA/WR (East Atlantic/Western Russia), SCA (Scandinavian Pattern) and POL (Polar/Eurasia Pattern).

The aim of this work is to correlate winter rainfall in Galicia with the value of the indices characterizing those teleconnection patterns. We have used values of precipitation between 1977 and 1998 from 47 stations of the National Institute of Meteorology covering Galicia, accumulated for the period December-January-February (DJF). Values of the indices were obtained from NOAA's Climate Prediction Center (CPC, <http://www.cpc.noaa.gov/data/teledoc>).

Results show that in average NAO is the pattern with a higher value of correlation, but SCA, EA/WR and EA present also a significant value of correlation. If we look at the internal variability in Galicia, we can see that EA/WR is the main index in the northern coast of Galicia from Finisterre Cap while NAO is the main index in

the rest. On the other hand, the SCA pattern is present in the whole area of Galicia. This result is very significant, because in the northern coast of Galicia is located the meteorological station of La Coruña. This station is used in many works characterizing rainfall variability in the Iberian Peninsula (Rodo et al. 1997; Rodríguez- Puebla et al., 2001), introducing a bias for the whole area of Galicia.

In conclusion we can see that winter rainfall variability in Galicia can be explained only if we take into account at least four different teleconnection patterns in the North Atlantic area. NAO is the most important one in the inner part and the southern coast of this region, but in the northern coast EA/WR explains more variability of rainfall. This conclusion can be used to improve seasonal forecasts, considering that a forecast of NAO state in winter do not guarantees a good enough forecast of winter rainfall in Galicia.

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