



Predictive influence of sea surface temperature on teleconnection patterns in North Atlantic. A case study on winter seasonal forecast in NW Iberian Peninsula.

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Seasonal forecast in medium latitudes is a research field not too much developed, but it is likely to improve considerable as the dynamics of atmosphere and ocean as a coupled system are better understood. The aim of this work is to study the relationship between the global sea surface temperature anomalies (SSTA) and the most important teleconnection patterns which affect the North Atlantic area: North Atlantic Oscillation (NAO), East Atlantic pattern (EA), Scandinavia pattern (SCA), East Atlantic/Western Russia pattern (EA/WR) and Europe Polar/Eurasia pattern (POL). The relationship between SSTA and those patterns will be explored in autumn and winter, the seasons with the highest quantity of rainfall in the area under study. These teleconnection patterns have a relationship with climate characteristics in Europe. Therefore, any forecast skill over teleconnection patterns will mean a forecast skill on climate.

The SST data was provided by the NOAA/OAR/ESRL PSD, Boulder, Colorado, USA. The teleconnection indices were taken from the Climate Prediction Center of the NOAA between 1950 and 2006. Monthly precipitation and temperature data from 1951-2006 for two locations at NW Iberian Peninsula were obtained from the database of Meteogalicia, the forecast center of the Regional Government of Galicia. The methodology used in this work is the same one used in Phillips and McGregor, 2002 and Lorenzo et al., 2009.

Results show that SST anomalies in certain areas of the world ocean have a great potential to improve seasonal climate forecast in the mid-latitudes. A potential predictability for NAO and EA patterns in winter and for SCA and EA patterns in autumn was obtained. The value of those kind of correlations have been studied for a particular region, located at the NW part of the Iberian Peninsula, highlighting the possibility of perform a climate forecast for autumn and winter. This work could serve like a reference for many other regions in Europe, whose climate is influenced by the teleconnection patterns that appear in the North Atlantic region.

References:

Lorenzo, M.N., I. Iglesias, J.J. Taboada and M. Gómez-Gesteira (2009): Relationship between monthly rainfall in NW Iberian Peninsula and North Atlantic sea surface temperature. *International Journal of Climatology*. DOI:10.1002/joc.1959.

Phillips I.D. and G.R. McGregor (2002): The relationship between monthly and seasonal southwest England rainfall anomalies and concurrent North Atlantic sea surface temperatures. *International Journal of Climatology*, 22: 197-217.