Geophysical Research Abstracts,
Vol. 11, EGU2009-2587-3, 2009
EGU General Assembly 2009

Robust Predictors for Monthly Statistical Forecasting of Precipitation

C.A. Pires, R.M. Trigo, and M.A. Valente

Universidade de Lisboa, Instituto Dom Luis - Faculdade de Ciencias - Lisboa, Portugal (capires@fc.ul.pt, +351 217500807)

A statistical forecasting model of the precipitation monthly means over homogeneous regions of Iberia and United Kingdom is devised up to 3 months leading time. For each region, a pool of potential global predictor fields are considered (e.g. SST, surface pressure, geopotential height fields, surface moisture, snow cover). A preselection of valuable predictor areas, if existing, are obtained through semi-automatic analysis of the monthly-delayed correlation maps between the predictands and spatial moving averages (with about 1000 km of radius) of the potential predictor fields. A highly conservative statistical Monte-Carlo test is performed on correlation maps in order to discard spureously high correlations, albeith being statistically significant by single t-Student tests. For that, we compare the true predictand-predictor correlation maps with those obtained by random shufling of the predictand time-series and/or substituting it by white noise. We are then able to determine a threshold of significant correlation taken from correlation maps. Then, a PCA is done over the region where that threshold is overtaken. The set of the obtained leading PCs are believed to be robust preselected predictors. This technique is able to recover some known predictable teleconnection patterns at the monthly and seasonal time scale as for example the delayed correlation between some Euro-Atlantic atmospheric flow regimes (e.g. AO, NAO Scandinavian pattern), the ElNiño area and their influence in the precipitation and temperature in Europe. These predictors work as entries for any type of statistical model (deterministic or probabilistic). Here, we test a scheme of forward stepwise multilinear regression in cross validation mode. Classical evaluation forecasting scores are then computed.