Predictions of temperature and rainfall anomalies with the ECMWF Seasonal Forecast System-3

F. Molteni, T. Stockdale, L. Ferranti, M. Balmaseda, F. Doblas-Reyes

ECMWF, Reading, U.K

In March 2007, ECMWF has implemented a new version of its seasonal forecast system, referred to as System-3. The system is based on ensemble integrations of a global coupled model, composed by a recent cycle of the IFS atmospheric model, the HOPE ocean model and the OASIS-2 coupler. A new ocean data assimilation system was designed to initialise the operational seasonal forecasts, as well as a set of hindcast ensembles started at the beginning of every month from January 1981 to December 2005. After a brief review of the skill of the system in predicting tropical SST anomalies, which are the main source of seasonal predictability, an overview of the forecast skill for 2m temperature and rainfall anomalies is presented for the northern winter and summer season, as derived from the hindcast dataset. Skill scores are compared with potential predictability estimates derived under perfect-model assumption. A more detailed analysis of results will be presented for some specific regions and seasons, both in the tropics and in the extratropics. It will be shown that, in some cases, simple spatial or temporal filtering methods can improve the forecast skill obtained from the direct model output. Cases of successful and unsuccesful predictions of major, nearcontinental scale anomalies will be highlighted. The prediction of extreme events will be discussed.