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Instrument: Integrated Project

Thematic Priority: Global Change and Ecosystems

Deliverable M.6.8: Assessment of ensemble dressing methodologies

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Dissemination Level		
PU	Public	x
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the Consortium (including the Commission Services)	

Introduction

The majority of the work in this milestone appears in Bröcker and Smith (2007)[1] in their paper submitted to Tellus entitled From Ensemble Forecasts to Predictive Distribution Functions which is available on the Centre for the Analysis of Time Series (CATS) web site http://www.lse.ac.uk/collections/cats/Default.htm at LSE http://www.lse.ac.uk/collections/cats/papersPDFs/JB_dime_tellus_2007.pdf.

Background

The issue that the paper addresses is how to go from a set of discrete points which is the prediction for an event from an ensemble forecasting system (the outcome of each model) to a distribution function which is continuous across the range. The paper discusses use two types of ensemble distribution methods through the use of kernel dressing and the use of parameterized distribution functions. One of the issues they raise is how to approach analysis where the ensemble members and verification do not share the same distribution. The paper then goes on to introduce a new kernel dressing technique called affine kernel dressing which is compared with existing techniques for use with 2m temperatures at Heathrow Airport and on Heligoland. To have a large enough samples the technique was tested using operational medium range ensemble forecasts for ECMWF with 1 to 10 day lead times. The details of the results need to be gained from referring directly to the paper.

Experience found in Seasonal Forecasts

What will be interesting is to see how much these issues of distribution differences have impacted on current and recent work with seasonal ensemble forecasting system. UNILIV in a report to EU FP6 AMMA certainly report large biases in the verification of monsoonal rainfall in West Africa depending on the basis of the validating data set i.e. NCEP or ERA-40 although this may be more a gross bias issue rather than more subtle distribution issue. Work undertaken at UNILIV does notice difference between the skill (per comm. Anne Jones, thesis in prep) found in validating at Tier-2 and Tier-3[2] for malaria incidence seasonal forecasts in Botswana. This is assumed to be due to the relatively small number of years, twenty, in total with 63 model members in the DEMETER data set and the use of a set point distribution across major forecast threshold such as that for upper tercile events.

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[1] Bröcker and Smith L.A. (2007) From ENSEMBLES Forecasts to Predictive Distribution Functions, **Tellus** (submitted)

[2] Morse, A.P., Doblas-Reyes, F., Hoshen, M.B., Hagedorn, R., and Palmer, T.N. (2005) A forecast quality assessment of an end-to-end probabilistic multi-model seasonal forecast system using a malaria mode**, Tellus A**, 57 issue 3 pp 464-475

Conclusions

It is recommended that the application modelling community work with the team at LSE within WP6.3 to look at how the use of ensemble dressing technique could be used to improve the skill in the forecast or at very least address some of the issues where sample sizes are relatively small. As sample sizes will always be small with seasonal forecasts compared with medium range ensemble prediction systems that issue forecasts twice a day.