



**Grant agreement no. 243964**

**QWeCI**

**Quantifying Weather and Climate Impacts on Health in Developing Countries**

**M3.1 a: Prototype seamless products from monthly to seasonal EPS systems**

Start date of project: 1<sup>st</sup> February 2010

Duration: 42 months

**Lead contractor :** ECMWF  
**Coordinator of milestone :** ECMWF  
**Evolution of milestone**

**Due date :** M12  
**Date of first draft :** M13  
**Start of review :** M15  
**Milestone accepted :** M15

Project co-funded by the European Commission within the Seventh Framework Programme (2007-2013)		
Dissemination Level		
PU	Public	PU
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)	

## Memo

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**To:** Andy Morse, Andrew McCaldon  
**Copy:** Franco Molteni, Adrian Mark Tompkins  
**From:** Francesca Di Giuseppe  
**Date:** 26th August 2011  
**Subject:** **Milestone 3.1a: Prototype seamless products from monthly to seasonal EPS systems.**

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### Introduction

A new calibration technique has been developed for the QWeCI project and implemented in a prototype suite which at the moment runs in cascade to the monthly forecasting system. The calibration will be also applied to the new system 4 which has just been officially realised on the 15<sup>th</sup> of August 2011.

Precedence has been given to the monthly forecasting system for a number of reasons. Firstly, due to the frequent updates that are made to the model physics and data assimilation system, each monthly forecast ensemble integration also runs a 5-member hindcast suite of integrations for the same months over the previous 18 years for calibration purposes. Thus, for every month a set of 19 years are available using an identical system. While the old system 3 seasonal forecast system also has an extensive hindcast suite, the lower resolution and the less recent model cycle (the seasonal system atmospheric model is updated less frequently) implies that the skill is lower relative to the monthly system in the overlapping first four weeks. . The third reason for emphasising the monthly system is that it is rarely used operationally in Africa, the products not being presently available via the EUMETCAST or RETIM distribution services, and not distributed for consideration in the consensus forecast process that occur in West, Eastern and Southern Africa each year. The aim is thus to demonstrate the usefulness and skill of a bias corrected product for sector relevant research and operational planning in the region.

The bias correction is performed on the five member ensemble mean precipitation in the following way. The 18 years of hindcast daily precipitation from the monthly forecast system is averaged over five consecutive five day periods to create pentads that are temporally equivalent to the GPCP data. As the monthly forecast system is presently initiated each Thursday (i.e. once a week), this sometimes necessitates the splicing of two consecutive forecast ensembles. For example, if a pentad period starts on 00Z Tuesday, the pentad will consist of days 6 and 7 of the previous forecast ensemble spliced with the first three days of the subsequent forecast ensemble. This splicing ensures that all pentads have on average similar lead-times. This is at the obvious expense of discarding forecast continuity, which is deemed acceptable since the splicing technique is only used in the training period, for which mean bias statistics are required; for forecasting purposes the bias correction is obviously applied to a single time-continuous forecasting ensemble.

The thus composed forecast pentads are decomposed into their leading EOFs. GPCP pentads are then projected onto the decomposed model modes to construct corrected ("mapped") EOFs which are employed to calibrate the actual forecast. The mapping technique has been applied for one independent year of forecast and "Corrected" precipitation fields are made available as an off line dataset to test the quality of the calibration technique.

## Data description

All files are self-explanatory netcdf files. LAT-LON regular grid at 1-degree resolution. They represent 'analysed' precipitation from the training dataset and are intended as a first example to test the quality of the mapping techniques.

*Mapping\_v1.0\_TP\_2009.tar.gz*: contains the **corrected** 73 pentads precipitation predictions for year 2009. The whole set of 51 ensemble members are provided. These are global fields.

*Monthly\_v1.0\_TP\_2009.tar.gz* contains the **control** 73 pentads precipitation predictions for year 2009. The whole set of 51 ensemble members are provided.

*GPCP\_MERGE\_v3.0\_TP\_2009.tar.gz* contains the GPCP **observations** for comparison.

Please note that:

GPCP coverage ends at August 2009

While correction has been applied only to the Africa regions, global fields are provided by merging the corrected areas with the uncalibrated predictions from the monthly forecasting system

## Data access

Data are available at the password protected ECMWF ftp site created for the QWECI project.

<ftp.ecmwf.int>

Access is given to consortium members on informal application

Dir: Prototype\_TP\_mapping

Files:

- 1 Mapping\_v1.0\_TP\_2009.tar.gz
- 2 Monthly\_v1.0\_TP\_2009.tar.gz
- 3 GPCP\_MERGE\_v3.0\_TP\_2009.tar.gz