

SPECIAL PROJECT PROGRESS REPORT

Progress Reports should be 2 to 10 pages in length, depending on importance of the project. All the following mandatory information needs to be provided.

Reporting year 2014

Project Title: Tailor-made seasonal forecasts for sub-Saharan Africa

Computer Project Account: SPDELAUX

Principal Investigator(s): Dr. Patrick Laux

Affiliation: Karlsruhe Institute of Technology
Institute of Meteorology and Climate Research
(KIT/IMK-IFU)

Name of ECMWF scientist(s) collaborating to the project
(if applicable)

Start date of the project: 01/01/2014

Expected end date: 31/12/2016

Computer resources allocated/used for the current year and the previous one
(if applicable)

Please answer for all project resources

		Previous year		Current year	
		Allocated	Used	Allocated	Used
High Performance Computing Facility	(units)			1,000,000	Approx. 2%
Data storage capacity	(Gbytes)			1,500	0.5

Summary of project objectives

(10 lines max)

The goal of the special project “Tailor-made seasonal forecasts for sub-Saharan Africa” consists in the development of improved and regionally adapted and optimized seasonal drought forecast products that integrate technical and climatic limitations. This goal is expected to be achieved by:

- i) Statistical Analysis of the raw (uncorrected) global seasonal forecasting system of ECMWF (S4) and NCEP (CFSv2) data in terms of precipitation amounts and its intra-(seasonal) rainfall distribution such as onset, cessation of the rainy season (Laux et al., 2008,2009), and various drought indices (SPI, EDI, etc.). The performance will be assessed for all ensemble members using different lead times and verification techniques.
- ii) Bias correction of the global seasonal forecasting system of ECMWF using different bias correction methods such as histogram matching or a Copula-based approach (Laux et al., 2011; Vogl et al., 2012).
- iii) Spatiotemporal refinement applying dynamical downscaling of selected ensemble members based on ECMWF and NCEP data. The results of the dynamical downscaling will be validated using gridded precipitation observations such as GPCC.

Summary of problems encountered (if any)

(20 lines max)

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Summary of results of the current year (from July of previous year to June of current year)

This section should comprise 1 to 8 pages and can be replaced by a short summary plus an existing scientific report on the project

After the first 6 month period no scientific results are available. The following tasks for preparing the downscaling activities were performed:

- S4 reforecast data are downloaded from the MARS archive and pre-processed to be used for regional downscaling;
- The post-processing tools were successfully compiled and tested on the (new) CRAY system;
- The regional climate model WRF has been compiled on the CRAY system at ECMWF;
- The WRF model has been setup for the regions of interest in SSA
- First performance simulations were performed on the CRAY environment.

List of publications/reports from the project with complete references

- Tan Phan Van, Hiep Van Nguyen, Long Trinh Tuan, Trung Nguyen Quang, Thanh Ngo-Duc, **Patrick Laux**, and Thanh Nguyen Xuan, "Seasonal Prediction of Surface Air Temperature across Vietnam Using the Regional Climate Model Version 4.2 (RegCM4.2)," *Advances in Meteorology*, vol. 2014, Article ID 245104, 13 pages, 2014. doi:10.1155/2014/245104.

Summary of plans for the continuation of the project

(10 lines max)

During the following months both reforecast products of ECMWF and NCEP will be analyzed systematically in terms of the performance of intraseasonal precipitation characteristics. This will be done based on the raw, the statistically refined (bias corrected) but also for the dynamically downscaled data. Therefore, the HPC environment of ECMWF (CRAY) will be used. It is expected that the HPC resources must be increased.

The performances of the S4 and the CFSv2 reforecast products will be compared for the two different regions in SSA.