PEACE, PROSPERITY AND
REGIONAL INTEGRATION

GREATER HORN OF AFRICA CLIMATE OUTLOOK FORUM PRACTICES

Second WMO WORKSHOP ON OPERATIONAL CLIMATE PREDICTION

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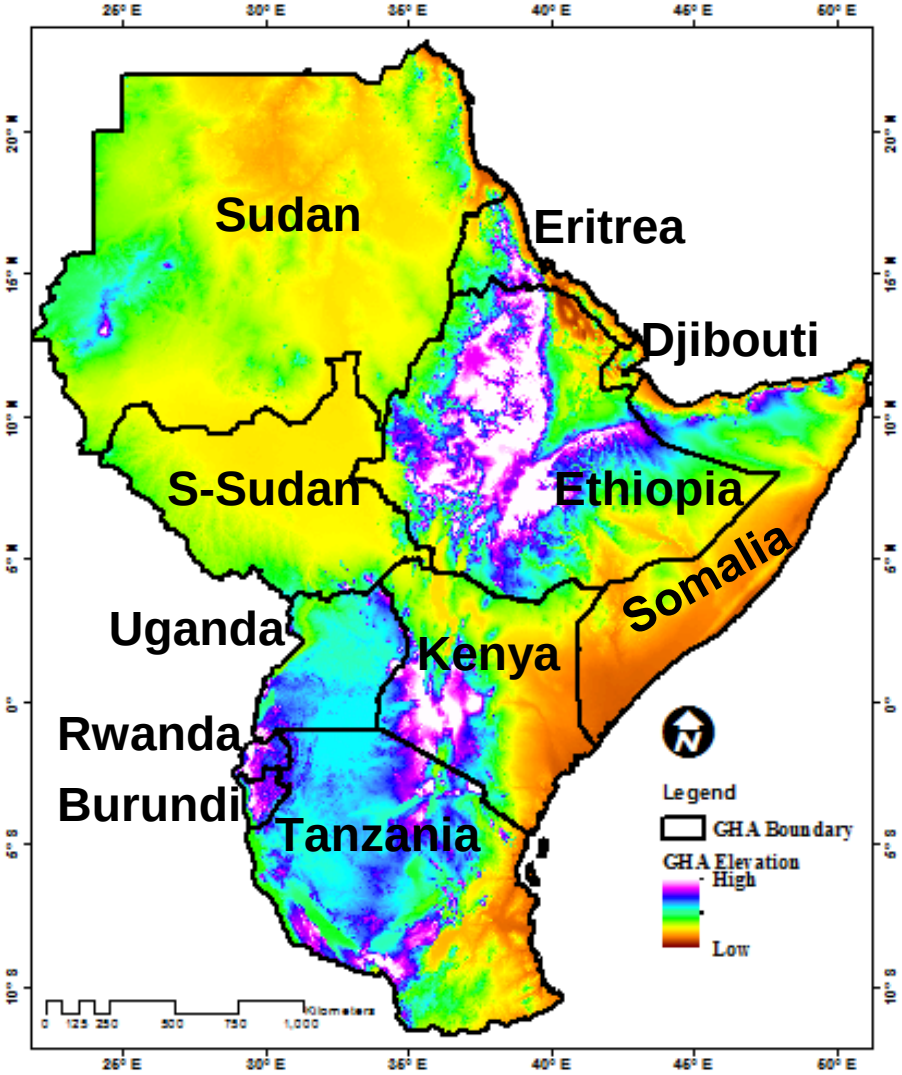


Vision: To be a world class centre of excellence in climate services for sustainable development in GHA

Mission: Foster climate services and knowledge to enhance community resilience for prosperity in the Greater Horn of Africa

GHACOF BACKGROUND AND OBJECTIVES

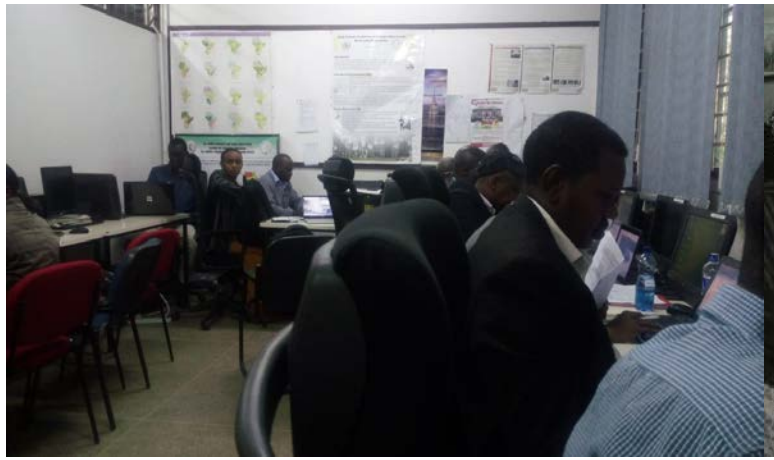
- GHACOF_1 was organized for the MAM 1998 rainfall season by ICPAC then named Drought Monitoring Centre (DMC).

- Forums are held 3 times annually for the major rainfall seasons over the region that is for MAM, JJAS, and OND.

- The objective is to provide early warning information for improved preparedness and mitigation of climate related disasters.

CAPACITY BUILDING WORKSHOPS

- Pre-COF Workshops for the NMHS occur 1 week before the forum.
- Each of the 11 member states in the GHA sends a representative.
- Representatives are taken through the process of generating the seasonal forecasts.

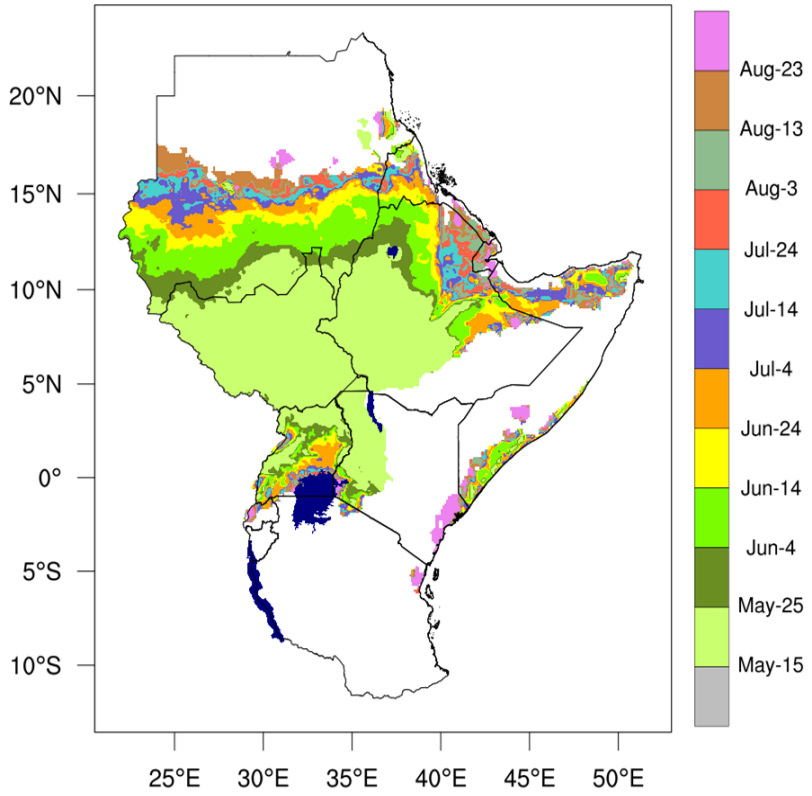


PreCOF Process: Dynamical Downscaling

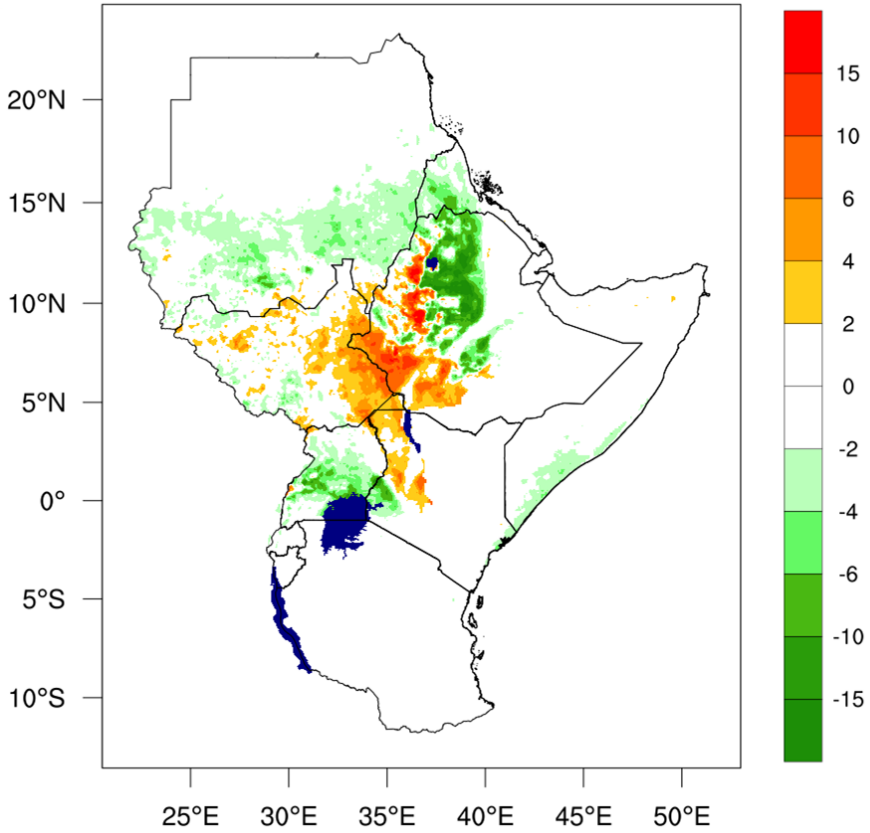
- The Weather Research and Forecasting model is utilized for dynamical downscaling.
- CFSv2 datasets are used as the forcing data.
- Recently **ensemble forecasting** has been introduced, model is initialized on different days using the same physics combination.
- Products include the **Onset/Cessation** dates, maximum **wet** and **dry spells** in each month and also within the season, min/max temperature and the mean temperature.

Samples of Dynamical Downscaling Products

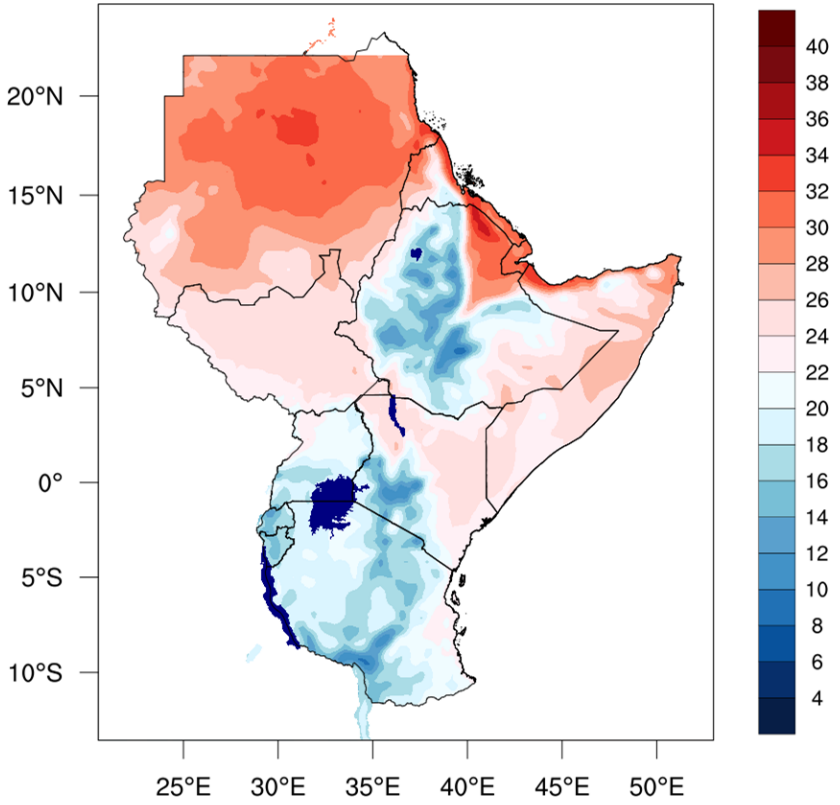
Onset Dates



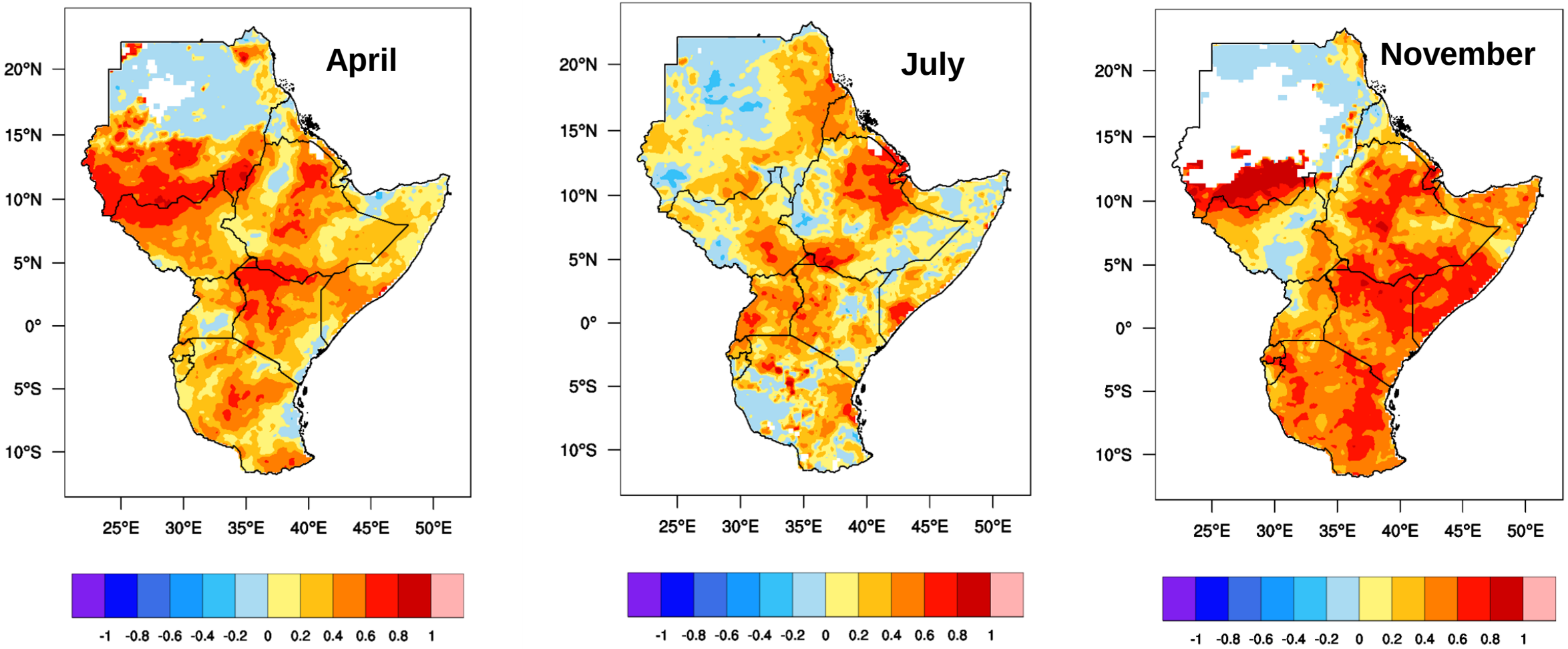
Max wet spell anomaly



Avg. Temp



WRF Hindcast Skill



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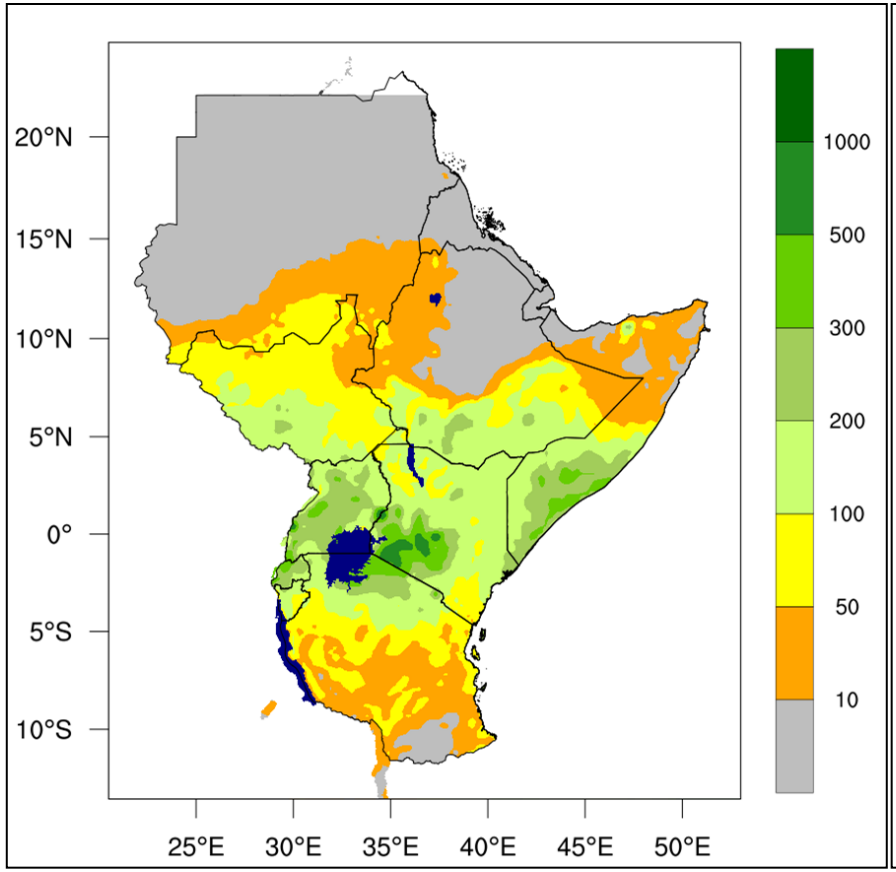
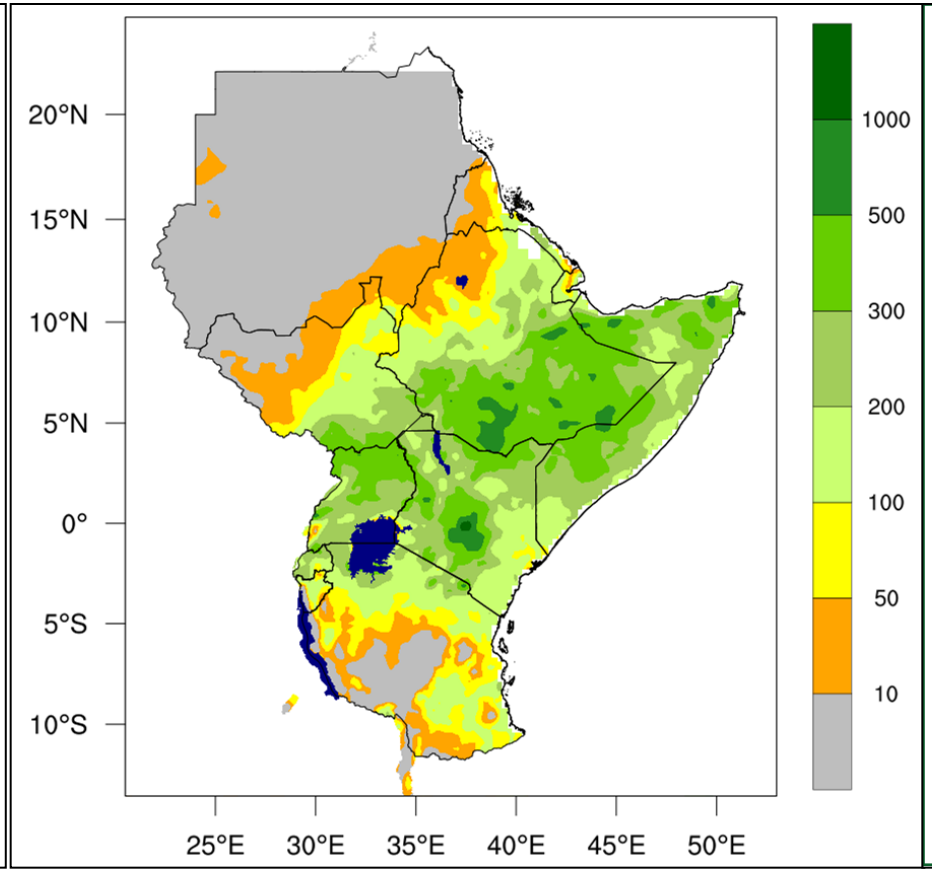
WRF BIAS CORRECTION: April example

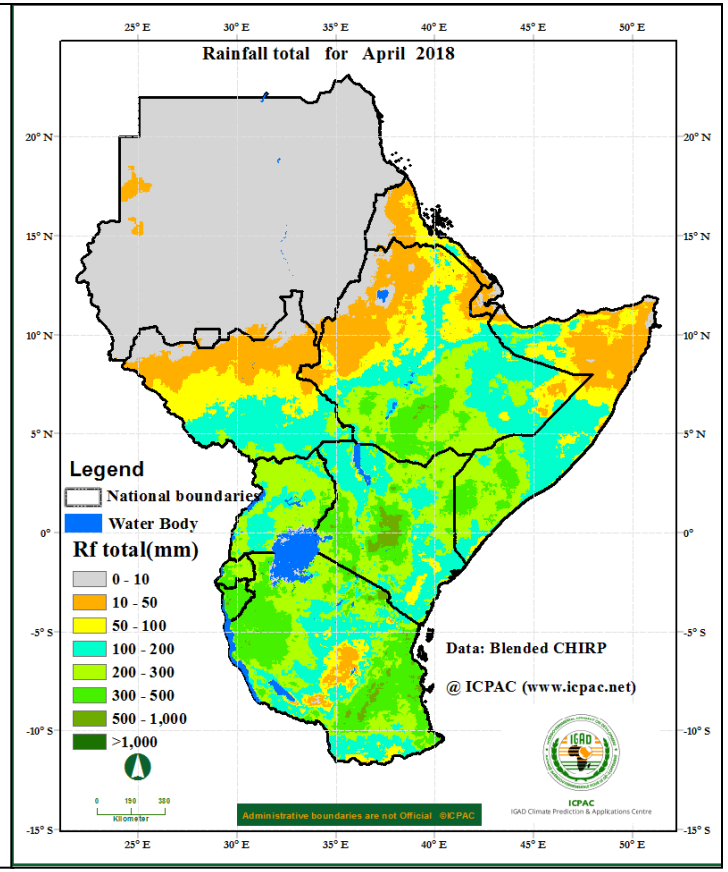
WRF



WRF BIAS CORRECTED



Observed



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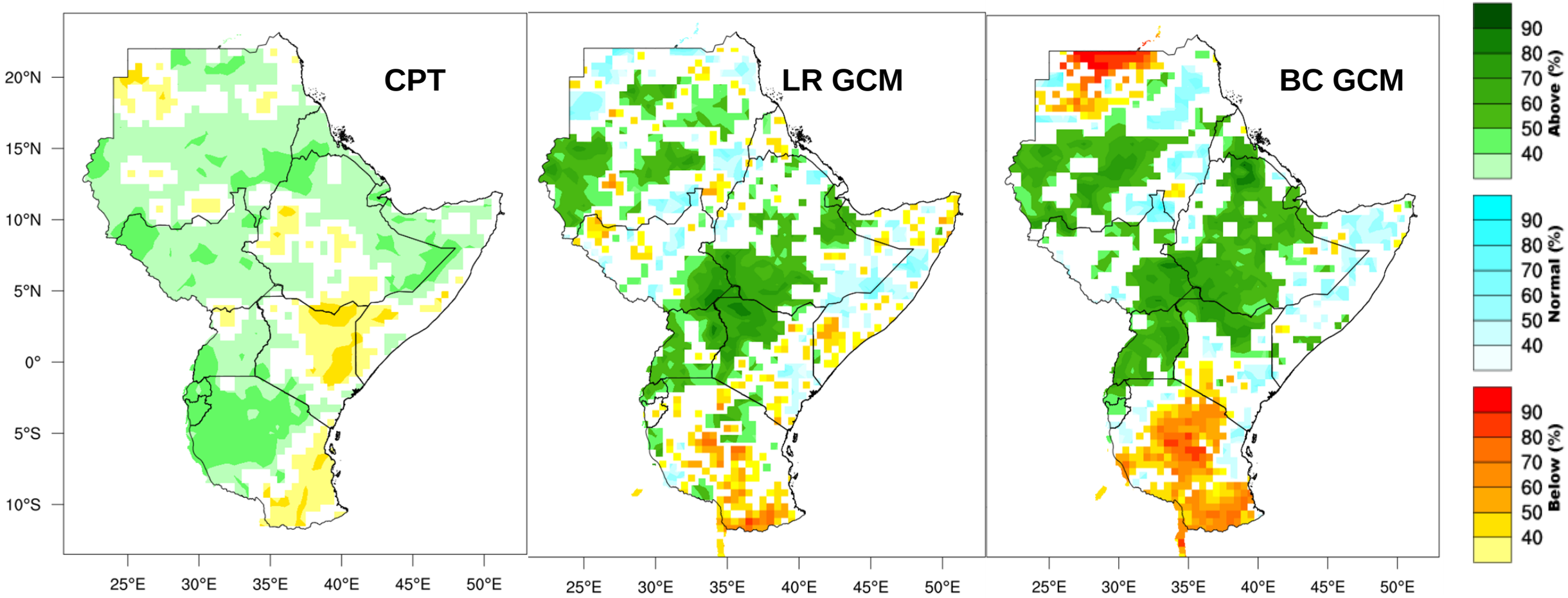
PreCOF Process: Statistical Downscaling

- Different tools and methods are utilized for statistical downscaling
  1. Climate Predictability Tool (CPT)
  2. GeoCOF tools
  3. Linear regression based downscaling of Global circulation models method using the NCL software
  4. Bias Corrected GCM forecasts using the NCL Software
- The CPT , Linear regression and Bias corrected methods use the same GCM models (CMC1, CMC2, CCSM4, GFDL and CFSv2).

Sample Products for Statistical Downscaling



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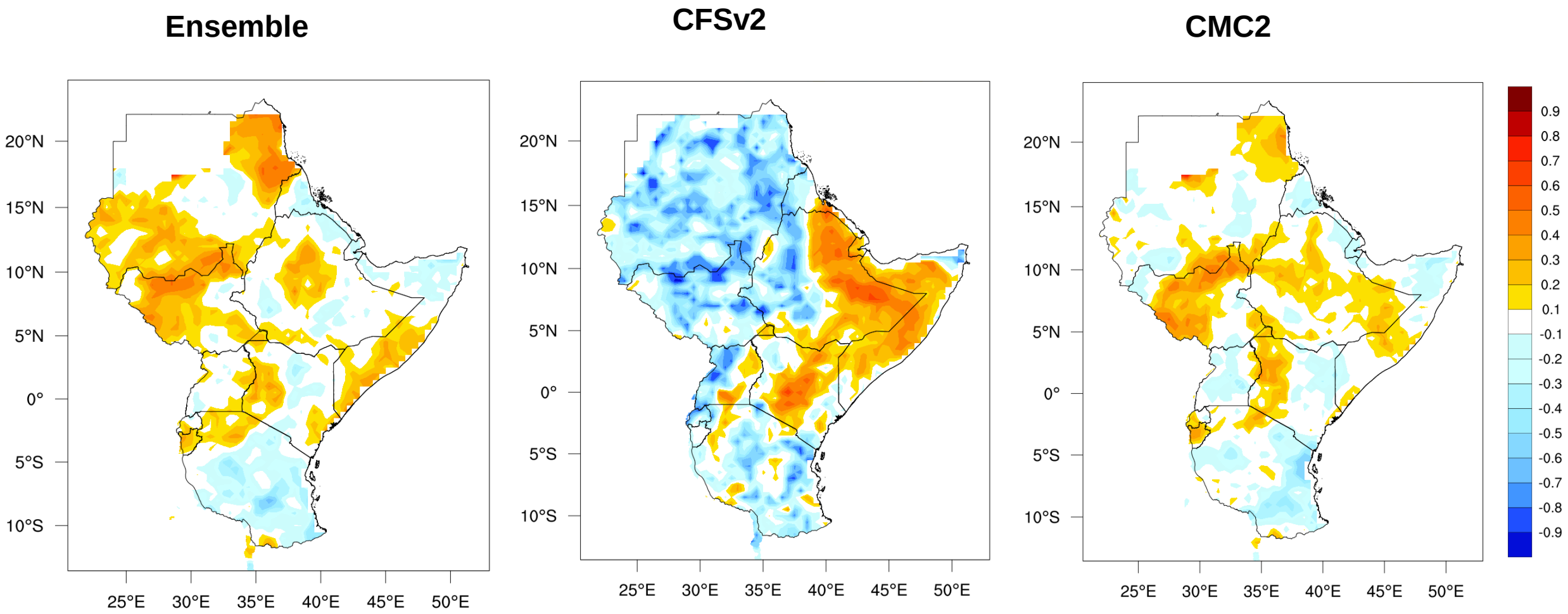
Evaluation of the seasonal forecasts: GCM Skill scores



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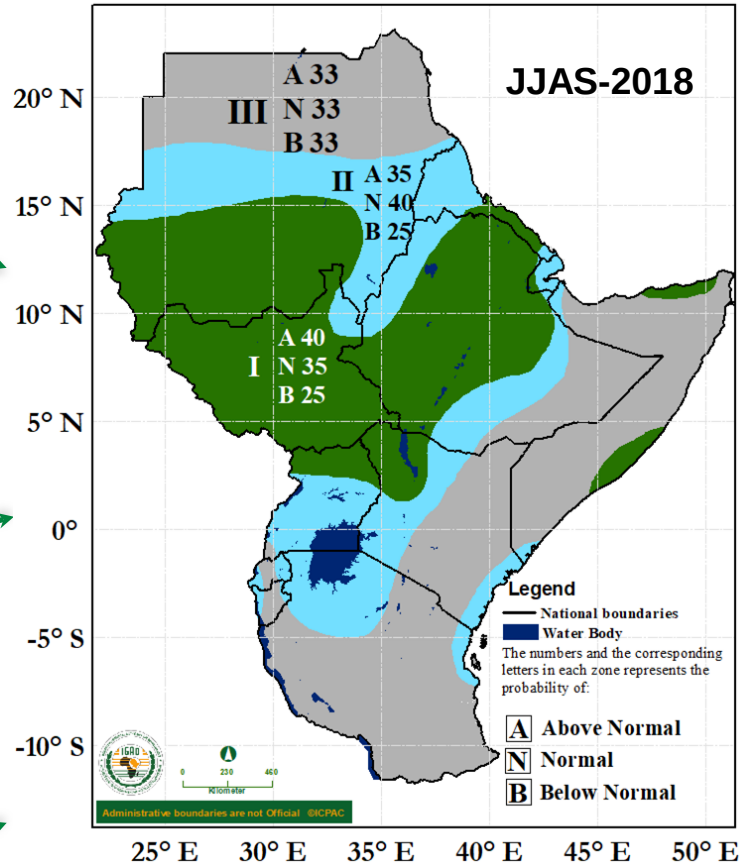
What constitutes a consensus

WRF output

CPT ENSEMBLE

BC GCM Ensemble



LR GCM Ensemble

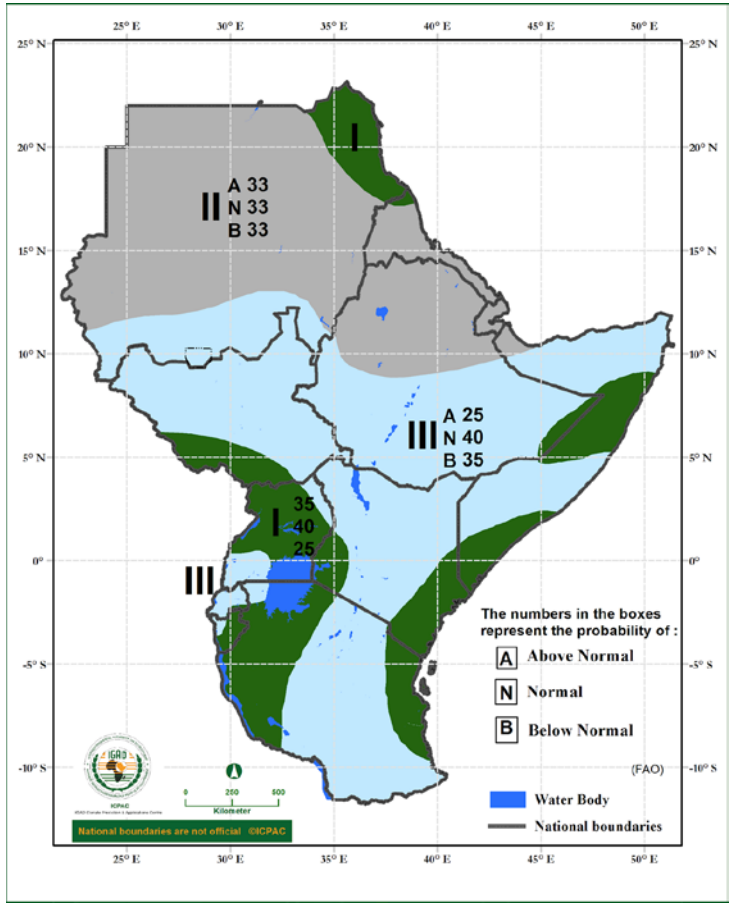
UK Met Office Outputs

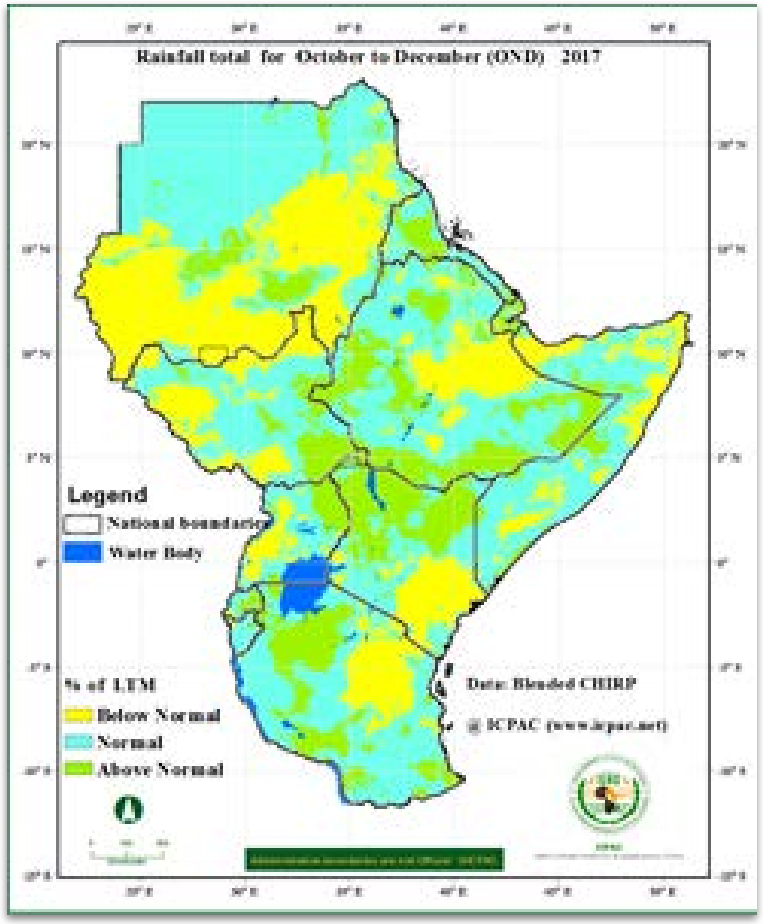
GeoCOF

Expert knowledge

Evaluation of the Seasonal Performance

- Evaluation is performed at the end of each season. The following metrics are calculated
  - Hit rate
  - Heidke Hit Skill Score

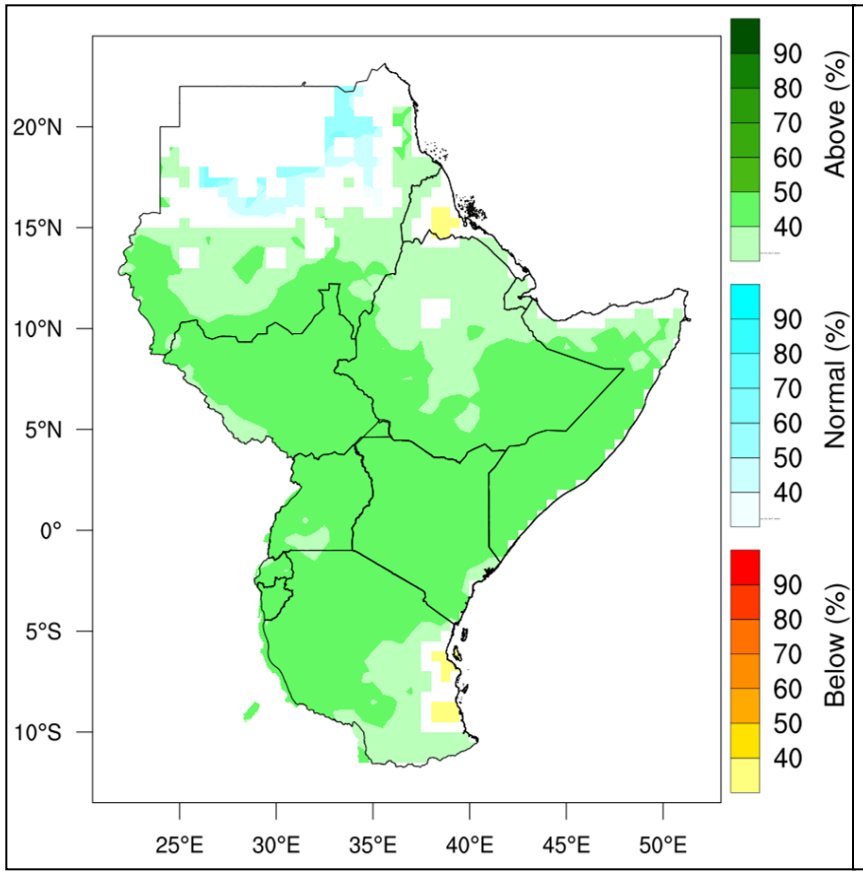




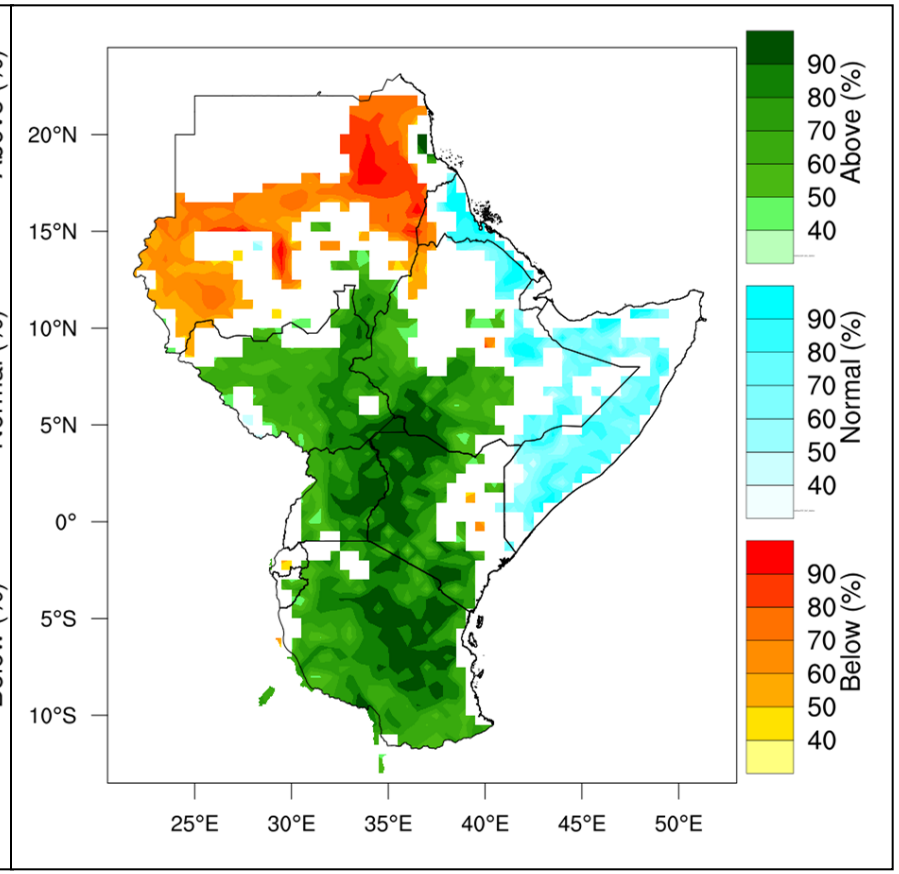
67% hit rate, and heidke skill score of 34%

Monthly Forecasts Update Assessments: April

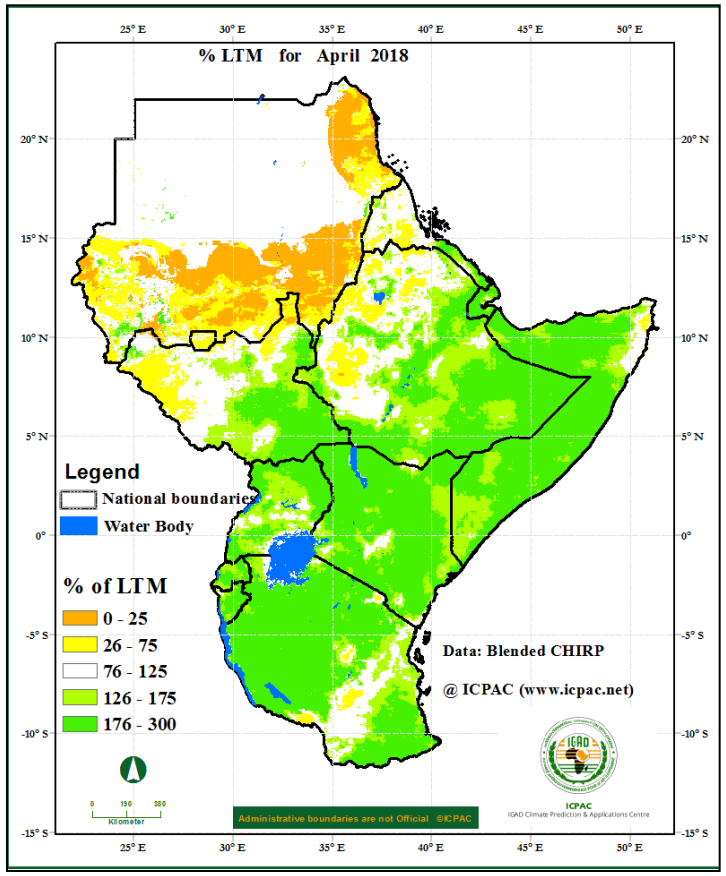
CPT



LR GCM



Observation



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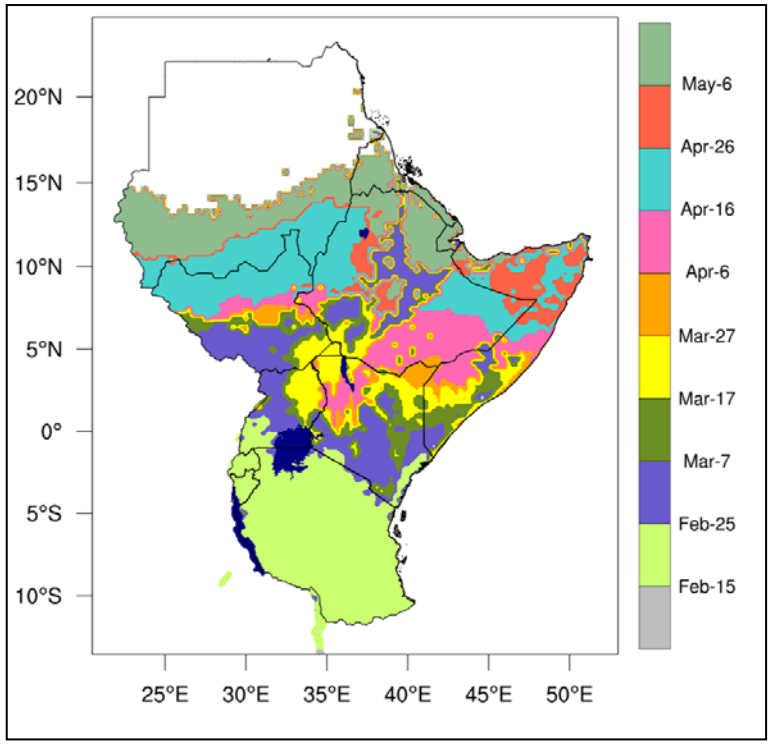
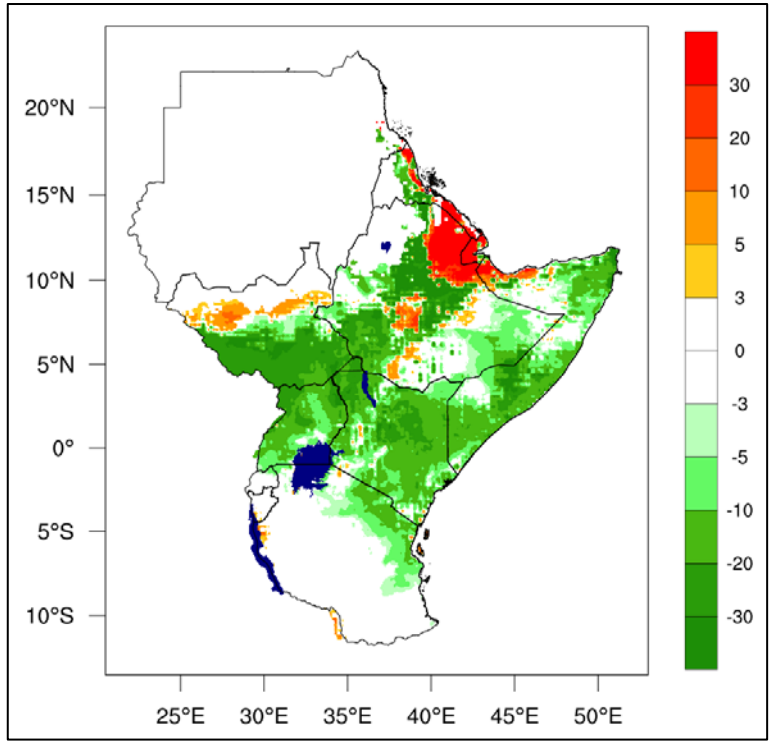
Evaluation of Forecast: Qualitative evaluation of onset (MAM 2018)

Forecasted



Anomalies



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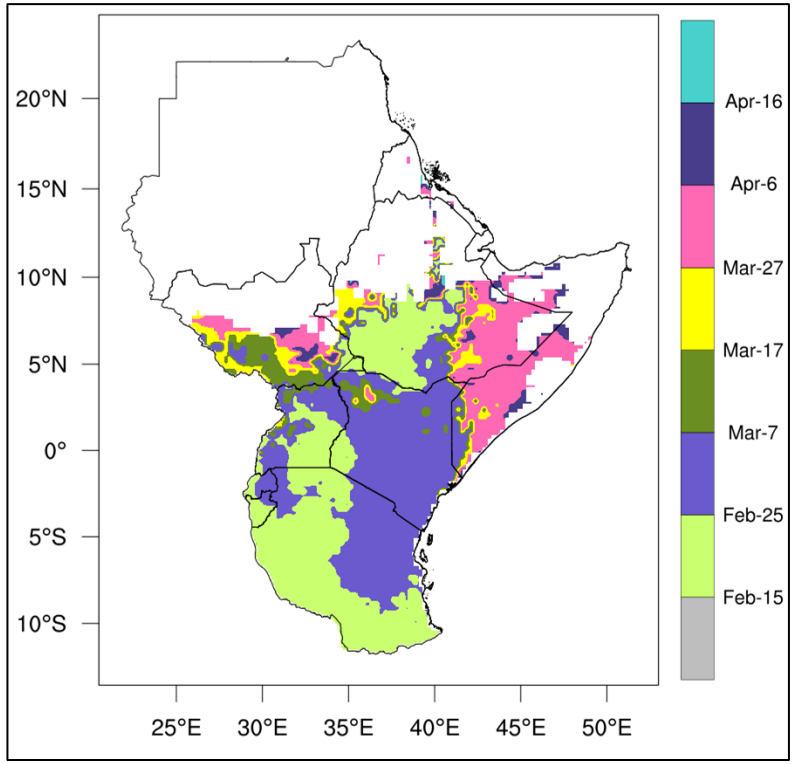

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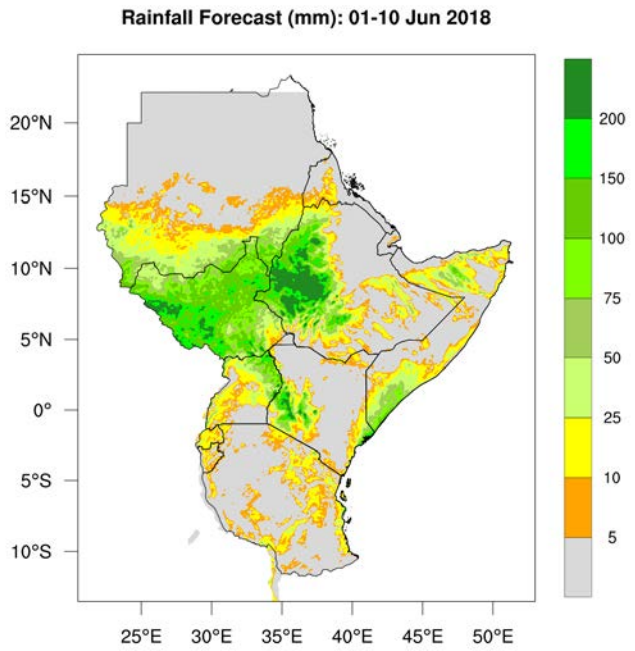
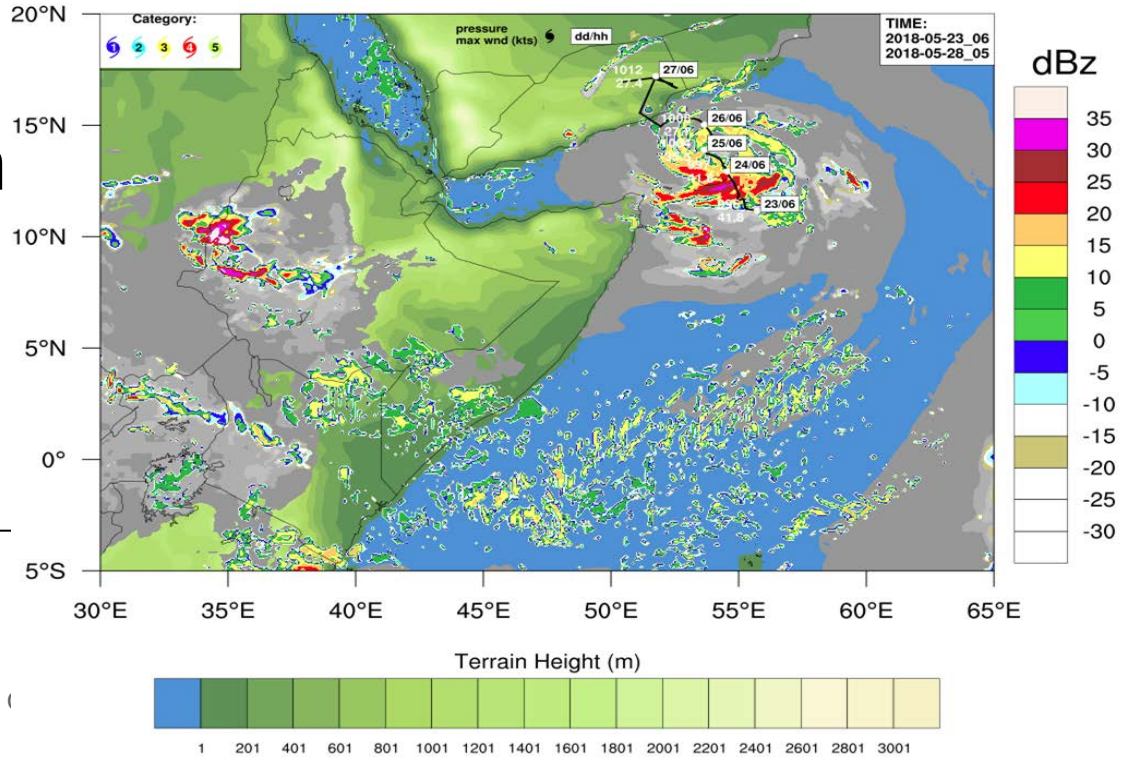
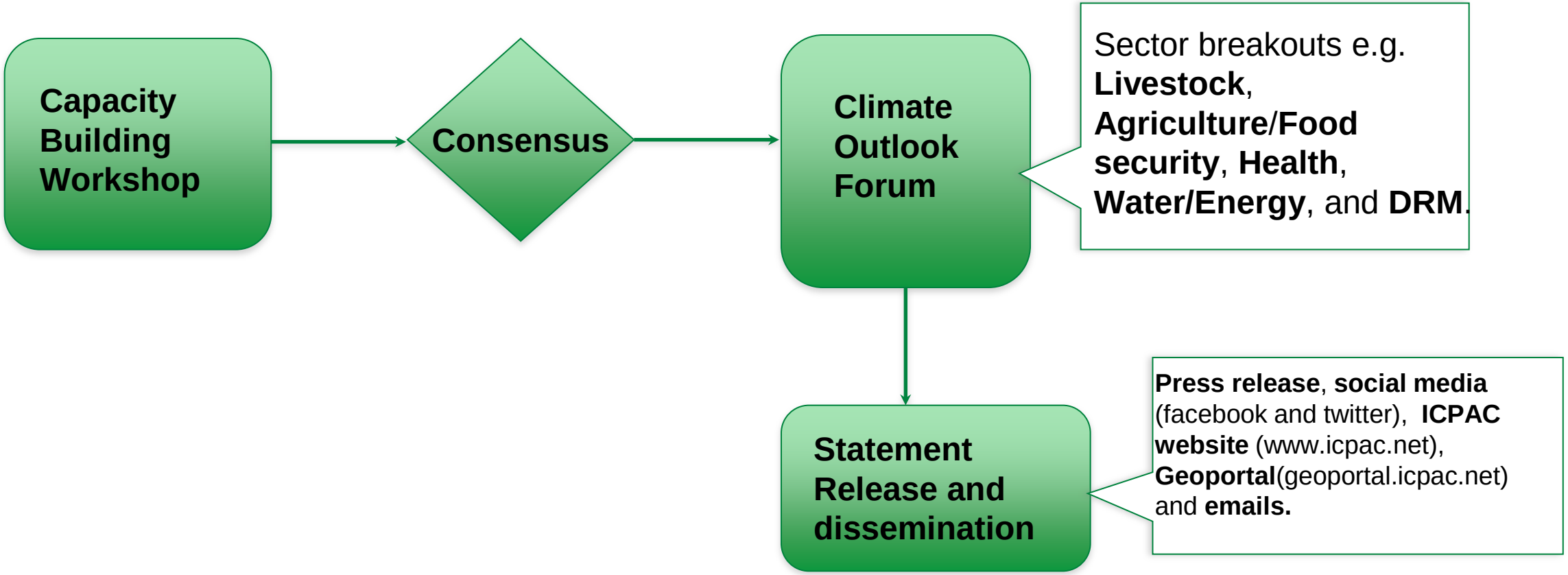
Forecasts Update

- Generated and disseminated on **dekadal**, **monthly**, and **three-month** rolling seasonal timescales.
  (http://www.icpac.net/ & http://rcc.icpac.net)
- **Climate Watch** is usually issued and posted on the web site and further disseminated to stakeholders through mailing list.





GHACOF Process Overview



Way Forward

- **Co-production** for user centred climate information services.
- Improved methodology for the consensus process and how to objectively incorporate the expert knowledge.
- Data assimilation for dynamical downscaling.
- More capacity building workshops for the NMHS, with consultations on the national level downscaled forecasts.

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Asante sana!