

Simulation of Ethiopian Kiremt(summer) Rainfall Using NCEP Coupled Forecast System (CFS)

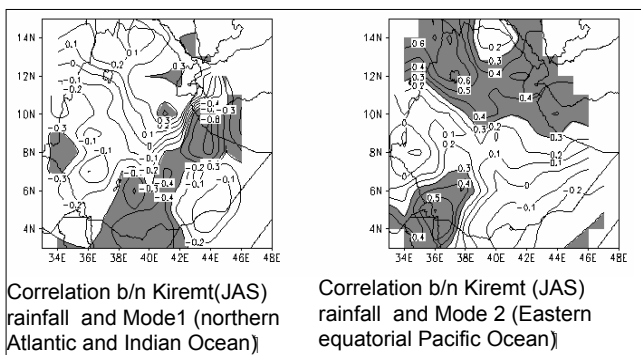
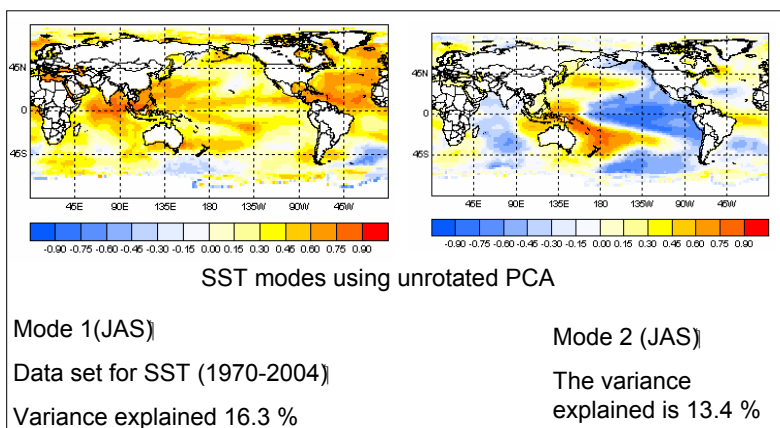
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Background

Kiremt (main rainy season)

- Kiremt (July-September (JAS))
- Contributes 65-95% of the total annual rainfall
- Kiremt is crucial for socio-economic activity of the country
- For this study we choose an area of a box enclosed by 7^o-14^oN, 34^o-43^oE
- Hence , improving seasonal prediction of the rainy season vital for the country various socio-economic sectors such as water, agriculture ,etc.

Objectives of this study is to diagnose the Ethiopian JAS observed rainfall and the CFS hindcast.

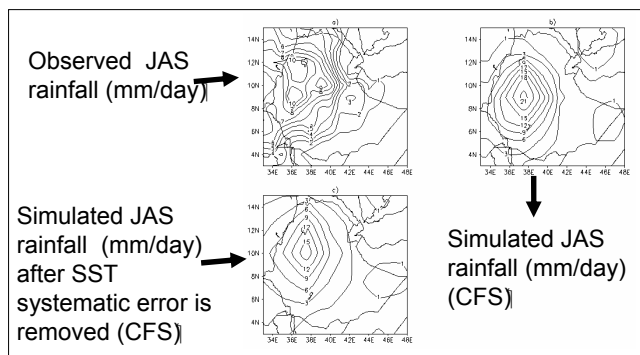
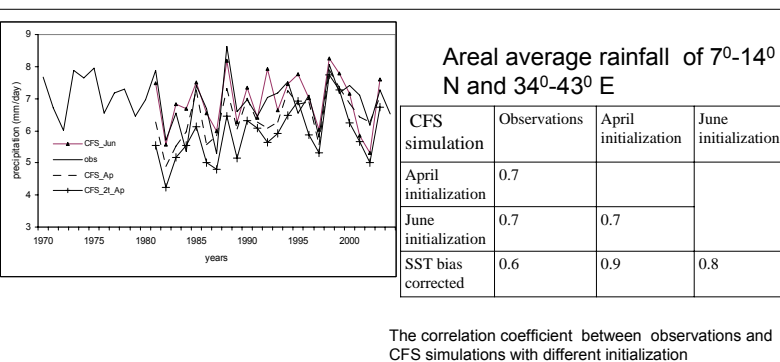


Results.

- CFS simulations captured the inter-annual variability of the rainfall. This helps to plan water resources
- Almost all simulation reproduced less amount of rainfall compared to the observations.
- The correlation coefficient between the observations and simulations are significant
- The observed rainfall amount is closed to the observations using the initialization of June

Data & Methodology.

- monthly rainfall data of 61 stations which span from 1970-2004
- NCEP reanalysis data R2
- Wind, soil moisture, SST
- CFS is developed by NCEP/NOAA
- Coupled climate model (atmosphere and ocean)
- Initialize with 15 days (ensemble of 15 members)
- April used as initial conditions of the model



Discussion.

- Considering JAS Ethiopian rainfall as one entity enables CFS simulations to capture the inter-annual variability whereas the spatial distribution JAS rainfall is poorly captured.
- Correcting the systematic SST errors and soil moisture improves the model to reproduce the rain bearing systems close to the observations
- The skill of climate models are low, however, CFS has high skill for ENSO prediction. Case studies like this will improve their performance .

Conclusions.

1. The Coupled Forecast System (CFS) shifted the rainfall belt south wards.
2. After the systematic error is removed the rainfall belt shifted towards north as well as the rain bearing systems.
3. The soil moisture is underestimated over the northern and eastern parts of the country.

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