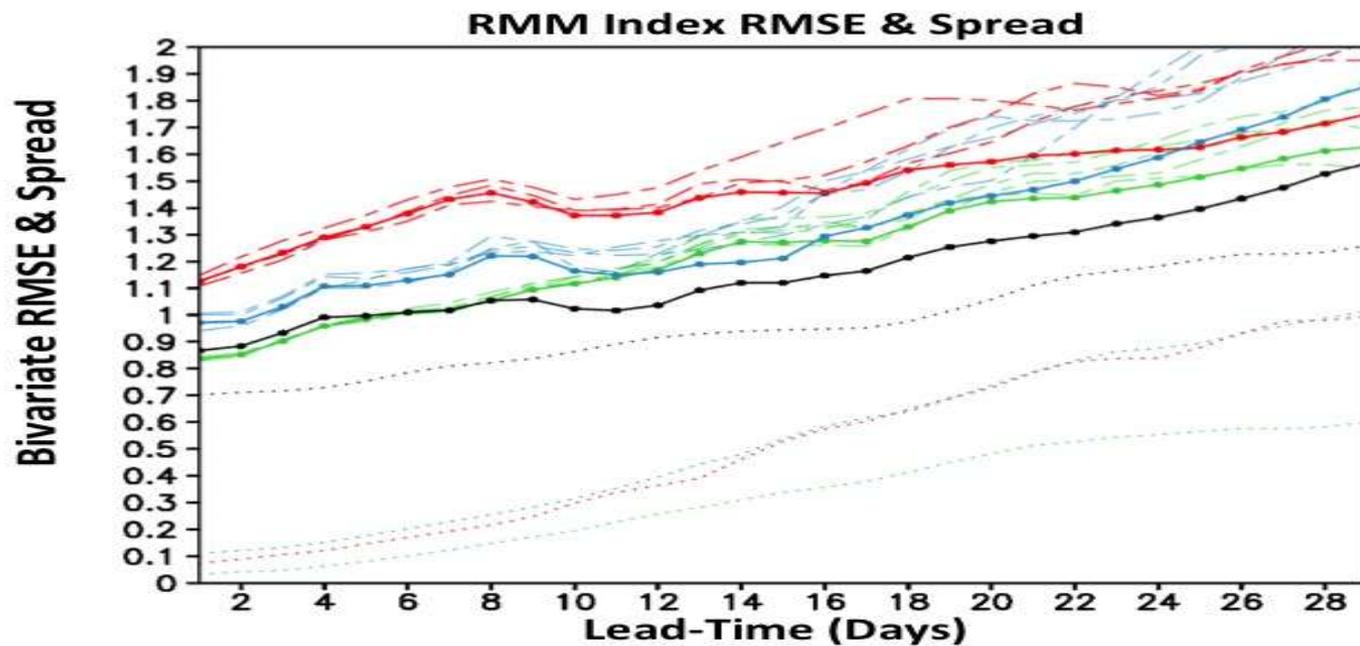
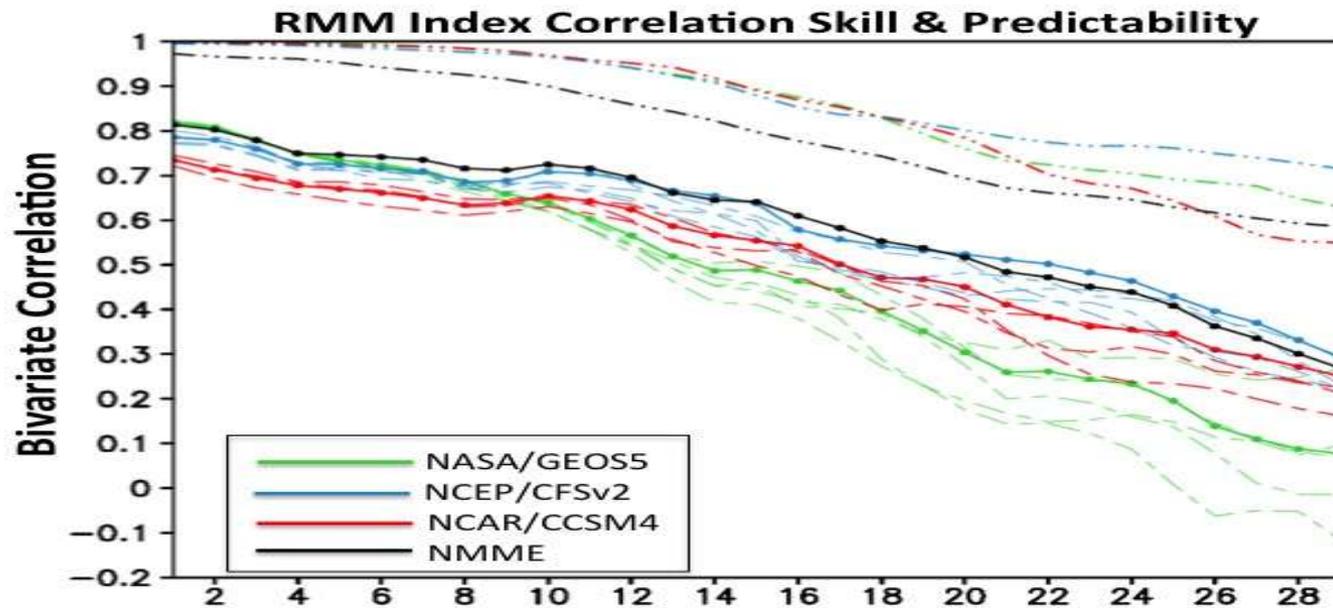


# CCSM4 Sub-Seasonal Effort

- **Re-Forecast experiments for Years 1999-2012**
  - **November Only, Minimum of 45-days, Initialized Every 5-days on the 2nd, 7th, 12th, 17th, 22th, 27<sup>th</sup> of November.**
- **Ocean and Atmosphere Initialized; Land Initialized - but updated every 10 days**
  - **Three Ensemble Members**
- **Daily means: SST, U200, U850, OLR, Precip, MSLP, Z200**
- **Research/Experimental**

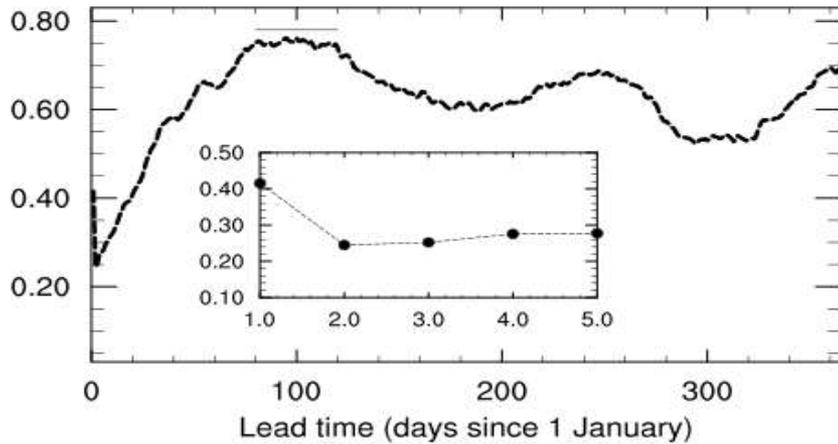


# But, Can Also Look at Monthly Initialized Cases

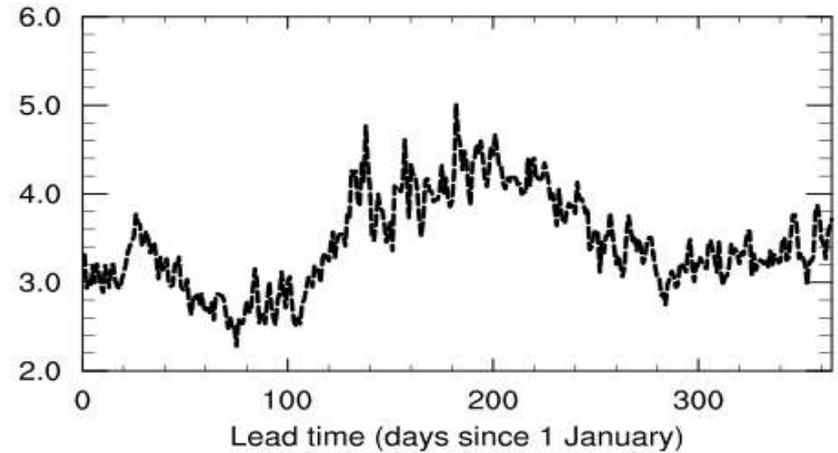
- **Hindcast/Forecasts are Initialized Using Data From the Last 5-Days of the Previous Month**
  - 10 Member Ensemble Initialized Every 12-Hours
  - Ex: 00Z, 12Z; 27, 28, 29, 30, 31 December -> January Forecast
- **Focus on Indian Ocean Sector**
  - No Special Emphasis on MJO
  - Sub-Seasonal Filtering
  - Homogeneous Predictability/Prediction

# Forecast Error: January Cases 1982-2010

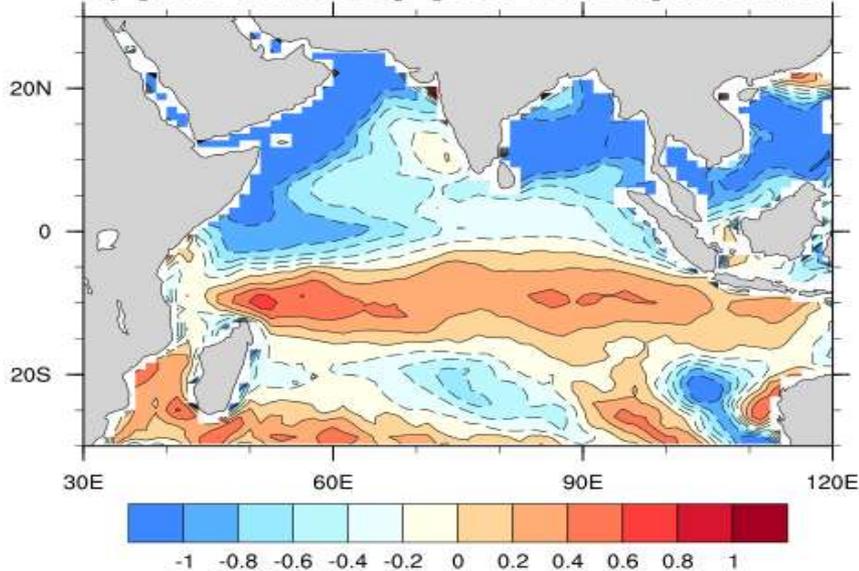
a) RMSE (SST)



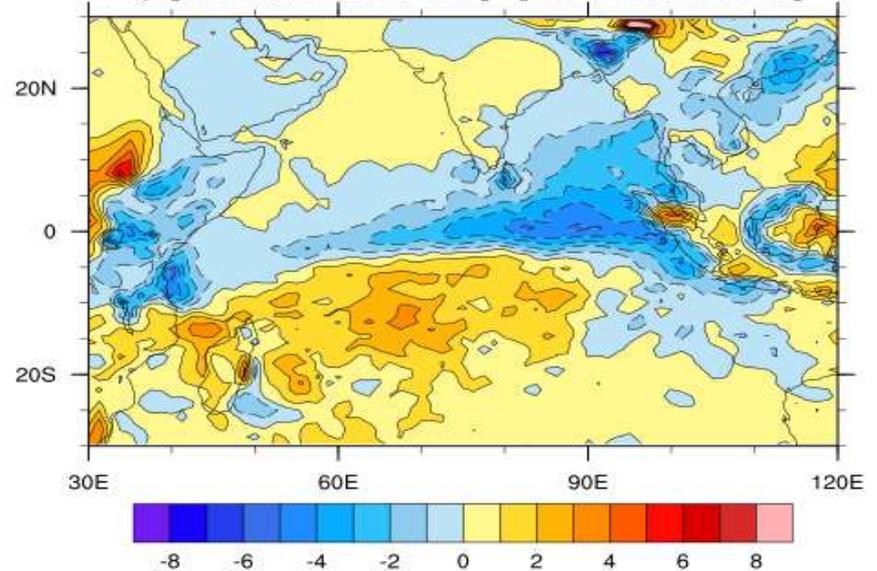
b) RMSE (PRECIP)



c) [MODEL CLI. SST] - [OBS. CLI. SST] : d80-d120

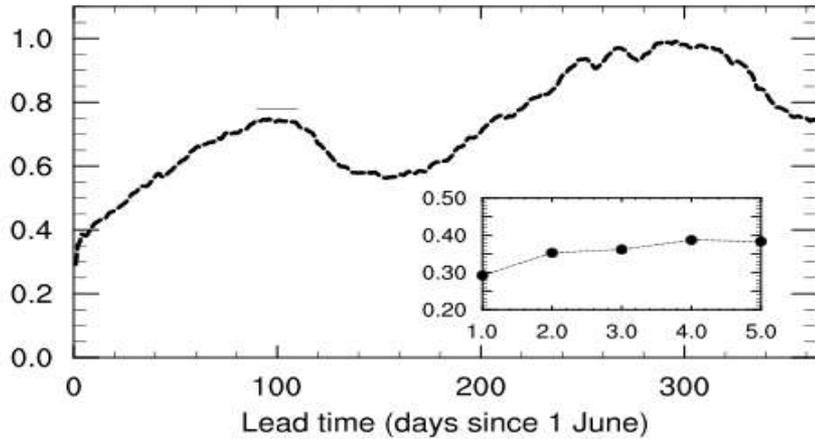


d) [MODEL CLI. PRECIP] - [OBS. CLI. PRECIP]

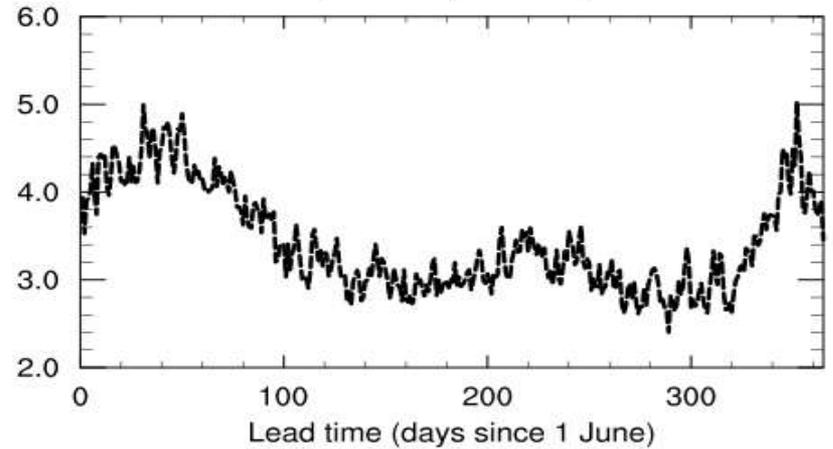


# Forecast Error: June Cases 1982-2010

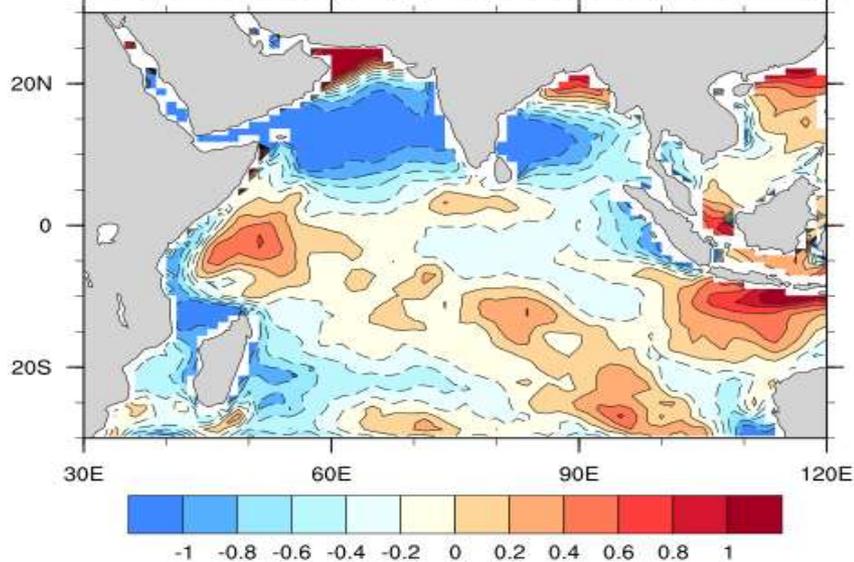
a) RMSE (SST)



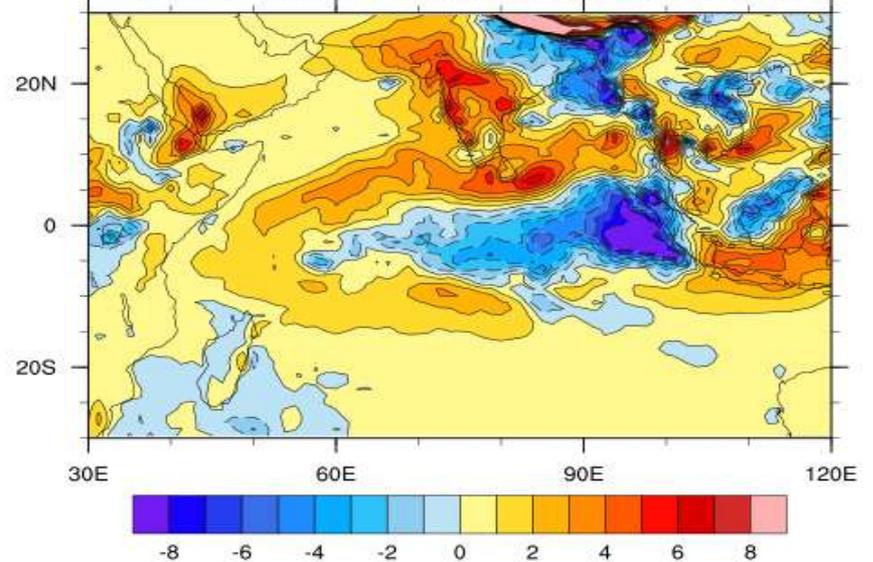
b) RMSE (PRECIP)



c) [MODEL CLI. SST] - [OBS. CLI. SST] : d90-d110

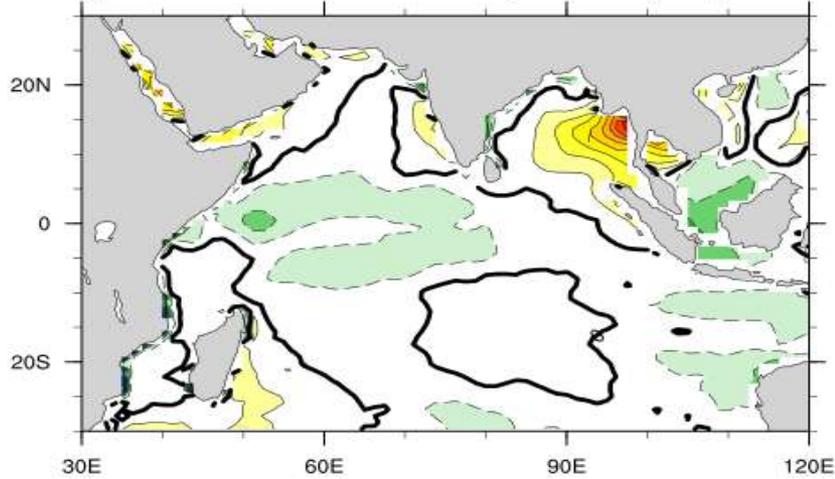


d) [MODEL CLI. PRECIP] - [OBS. CLI. PRECIP]

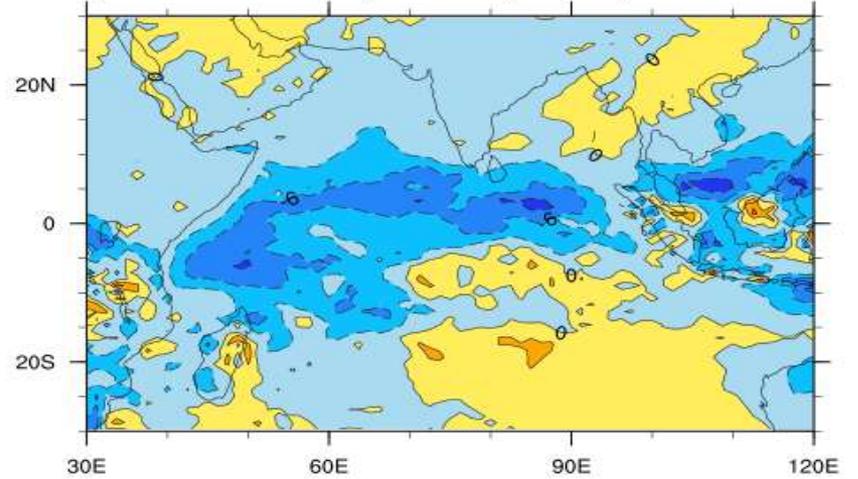


# SST and Rainfall Drift

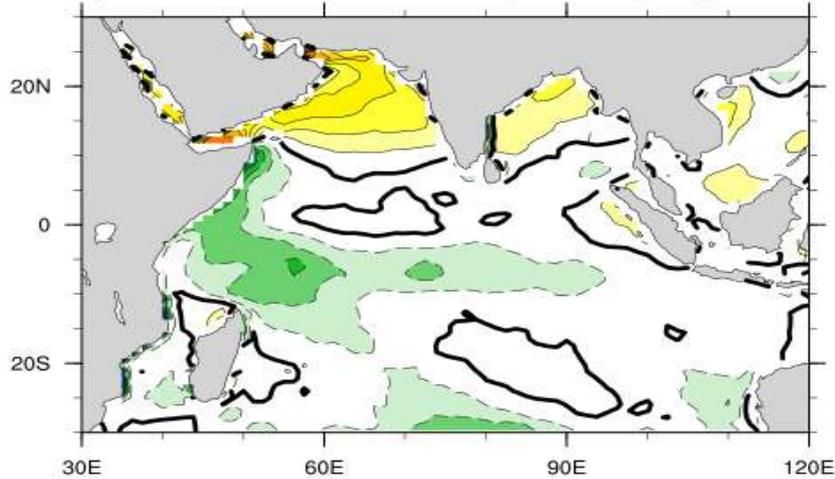
a) MODEL Drifts : SST Difference (1/1 - 12/31) : degree C



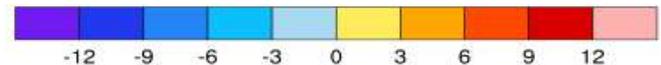
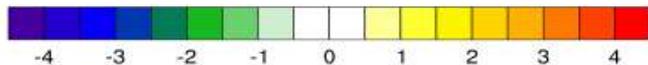
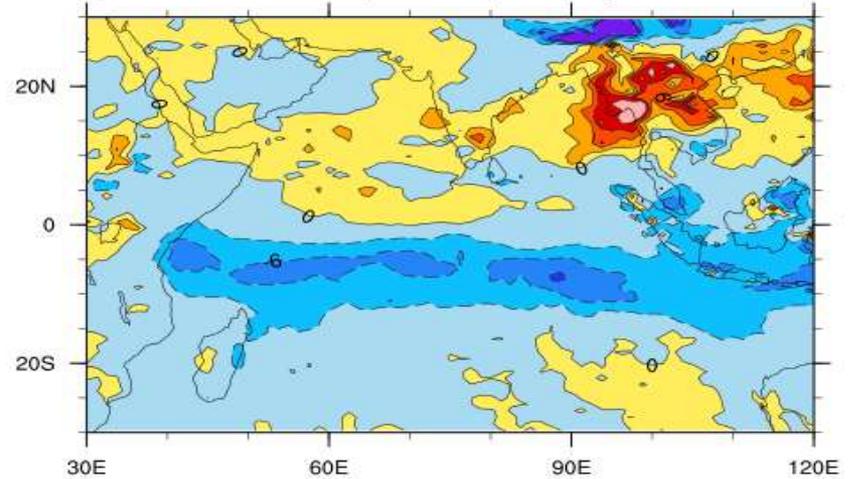
b) PRECIP Difference (1/1 - 12/31) : mm/day



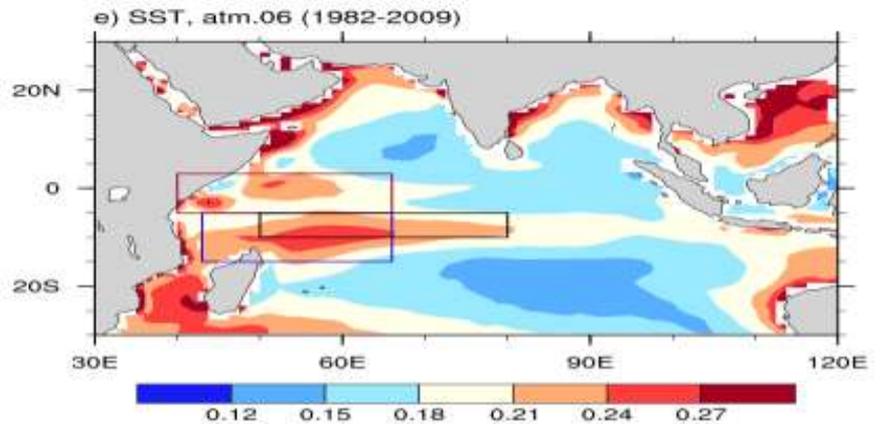
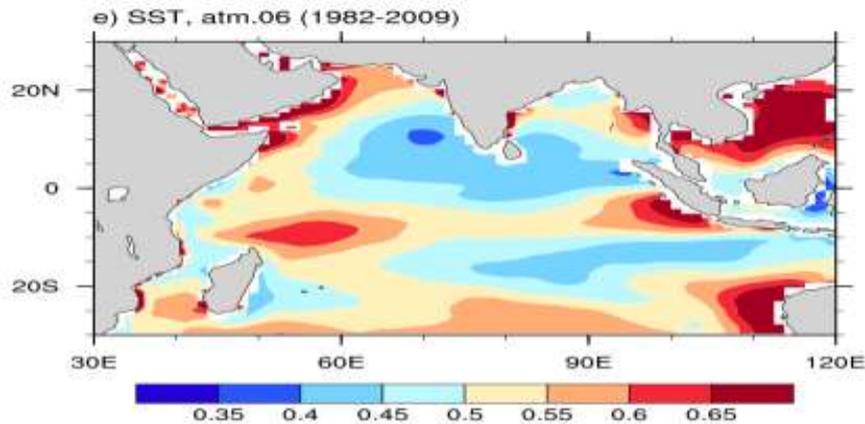
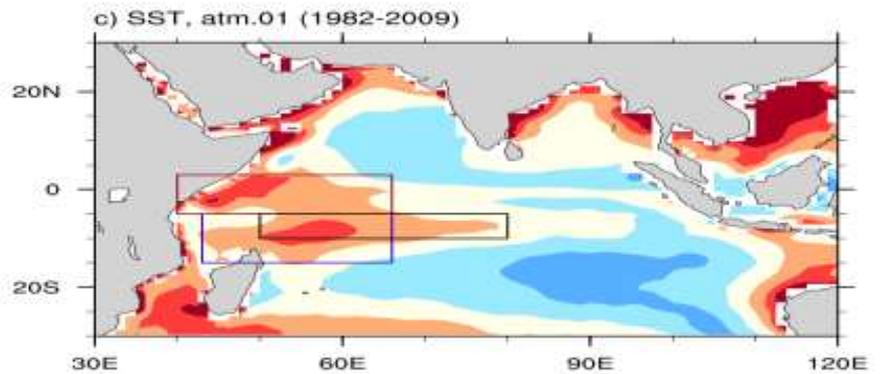
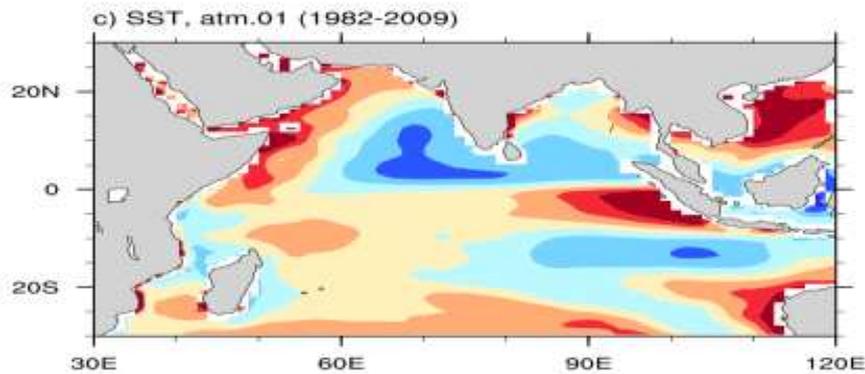
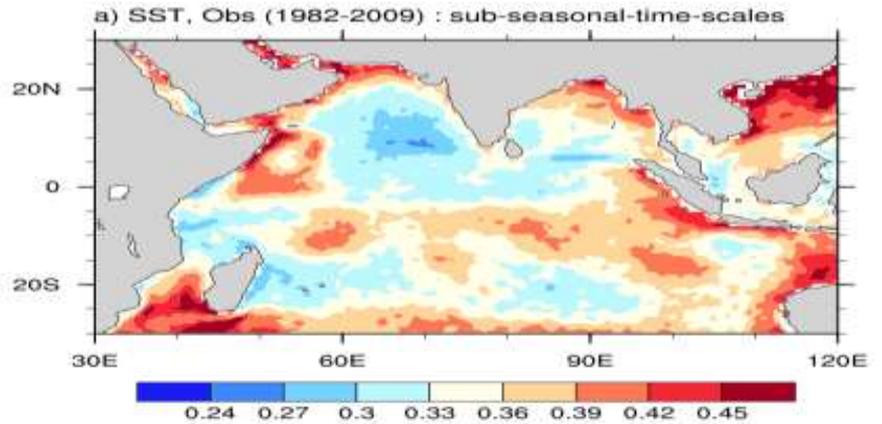
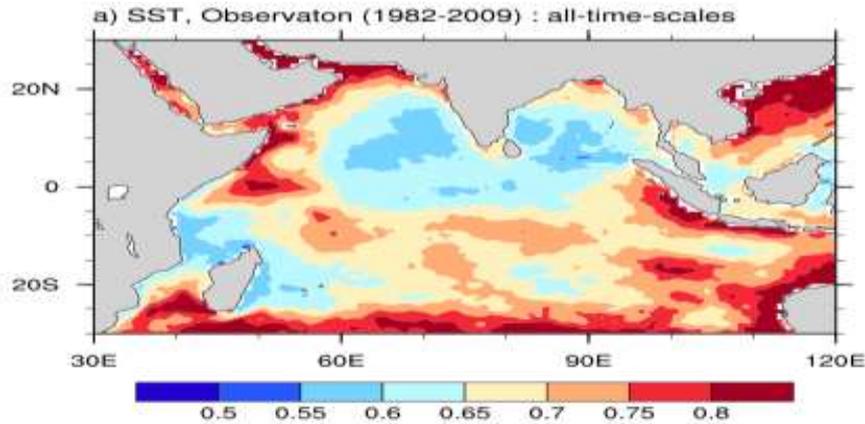
c) MODEL Drifts : SST Difference (6/1 - 5/31) : degree C



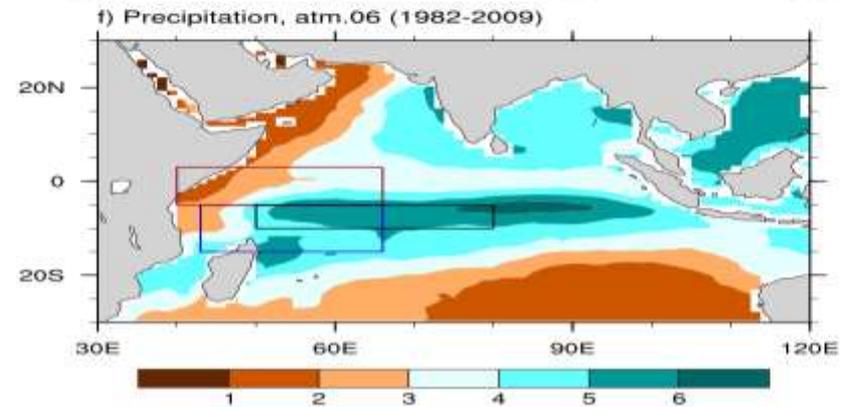
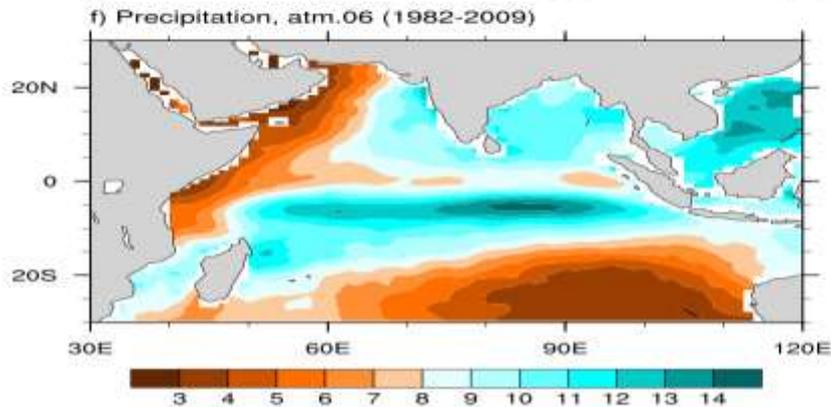
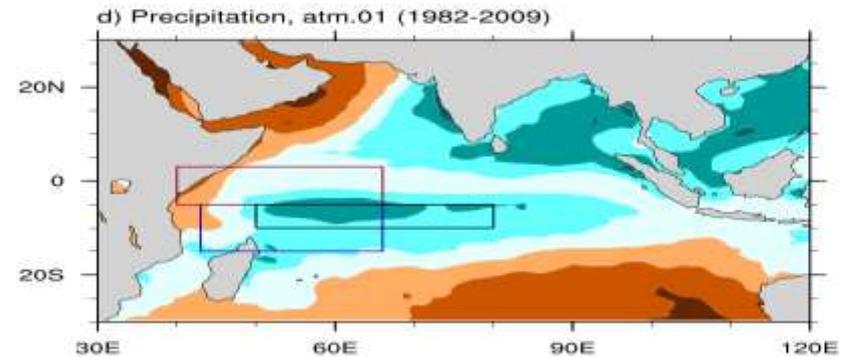
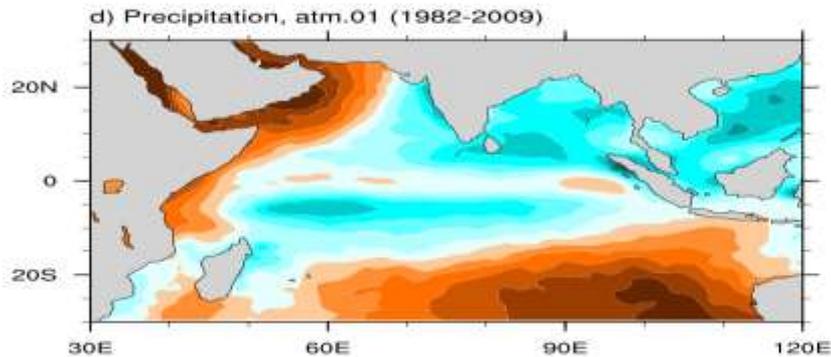
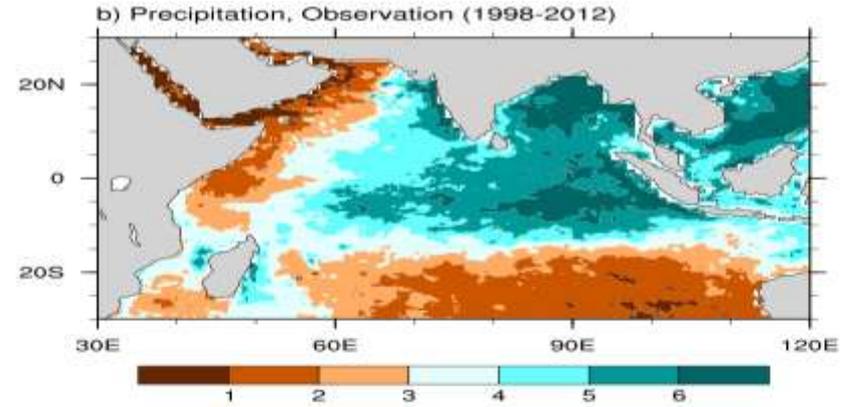
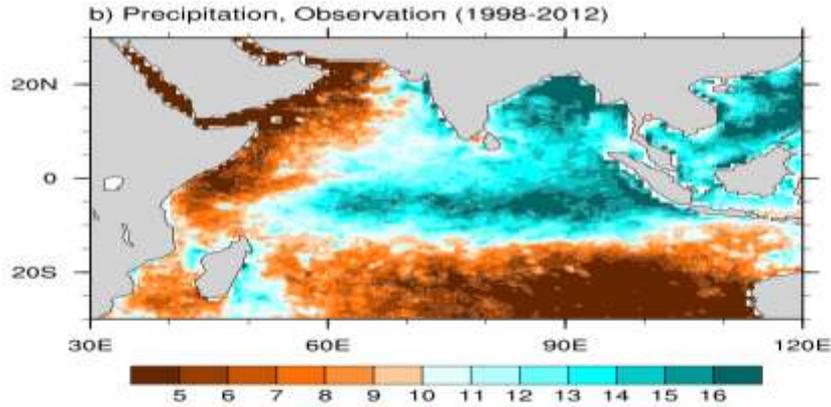
d) PRECIP Difference (6/1 - 5/31) : mm/day



# SST (Sub-Seasonal) Variance

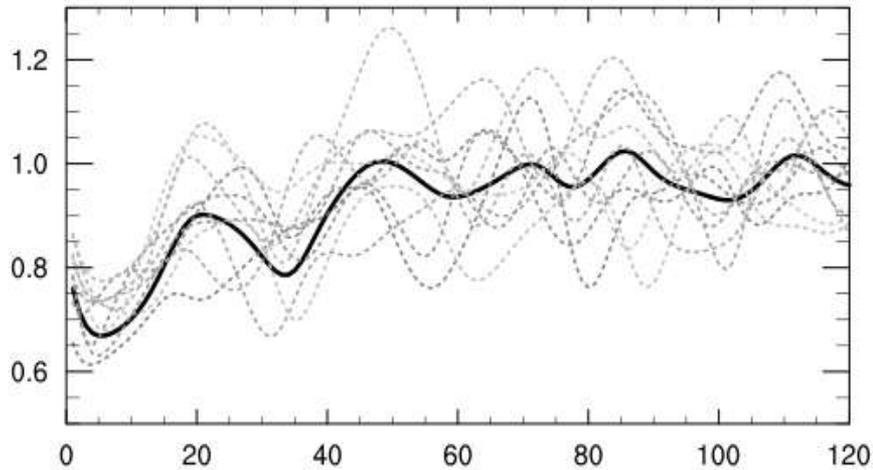


# Rainfall (Sub-Seasonal) Variance

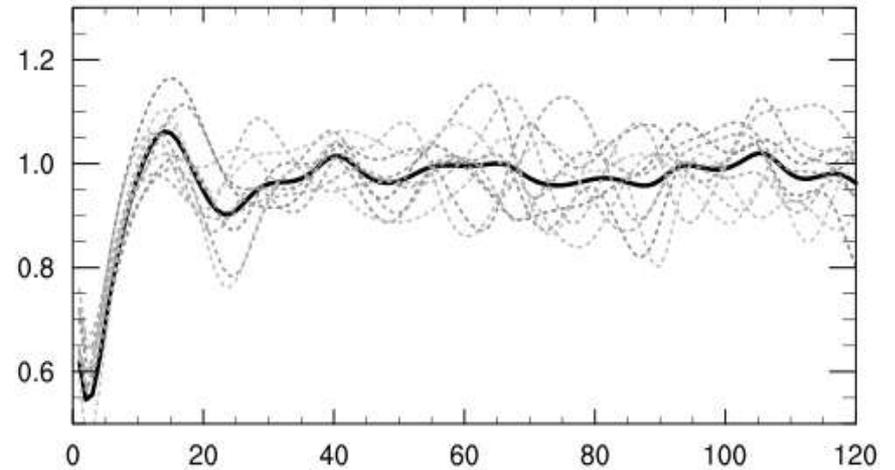


# SST Saturation RMSE

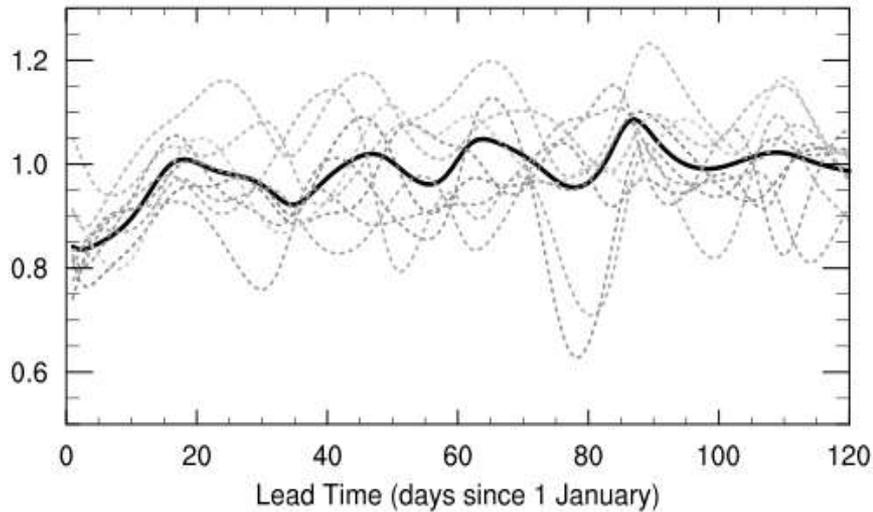
a) SCTR : SSTA (atm.01)



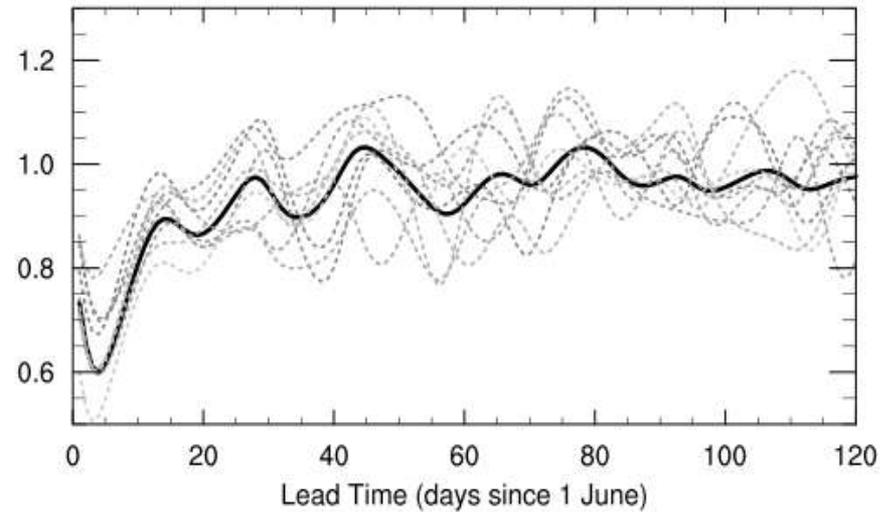
b) SCTR : SSTA (atm.06)



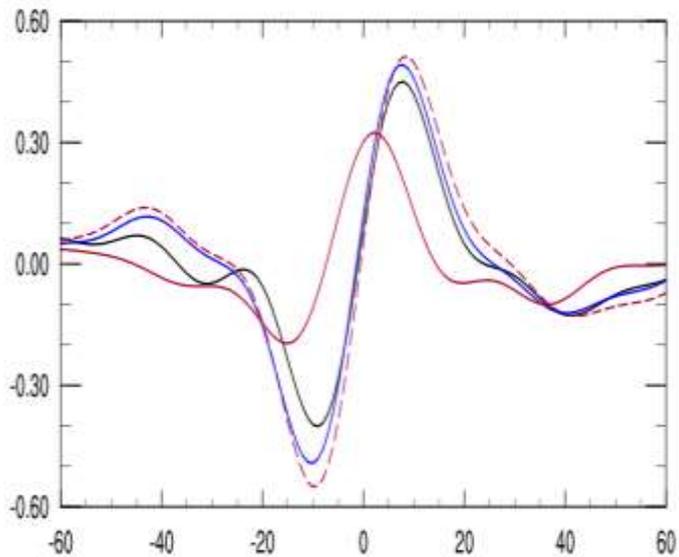
c) IO : SSTA (atm.01)



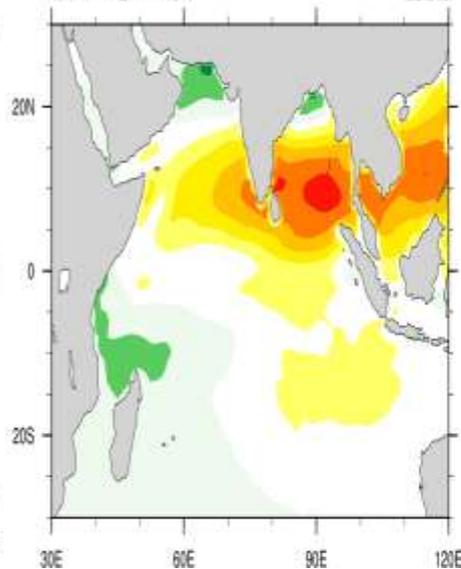
d) IO : SSTA (atm.06)



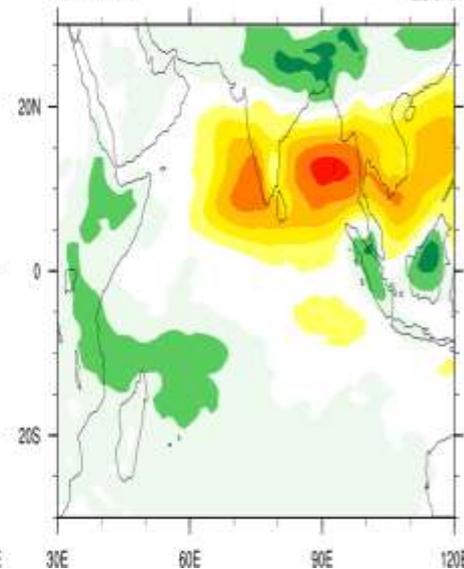
a) Correlation (MODEL): SST & PRECIP'



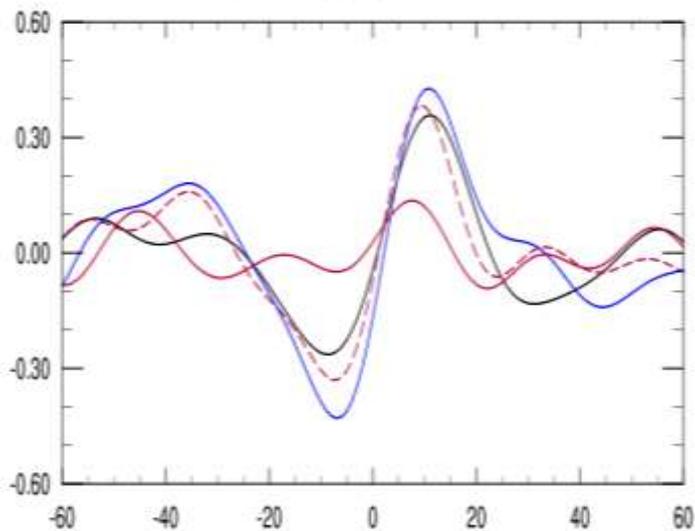
b) SST (lag = 8 days) 26.0%



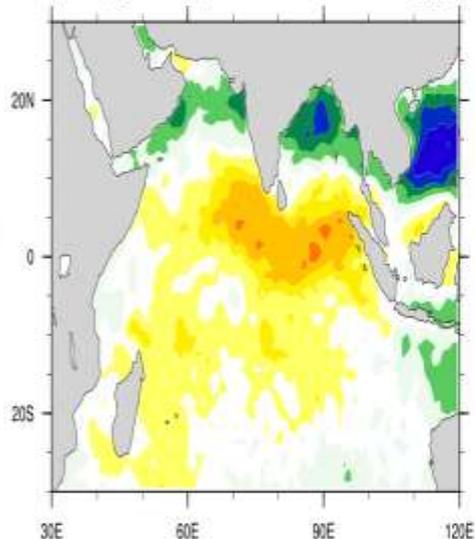
c) PRECIP. 26.0%



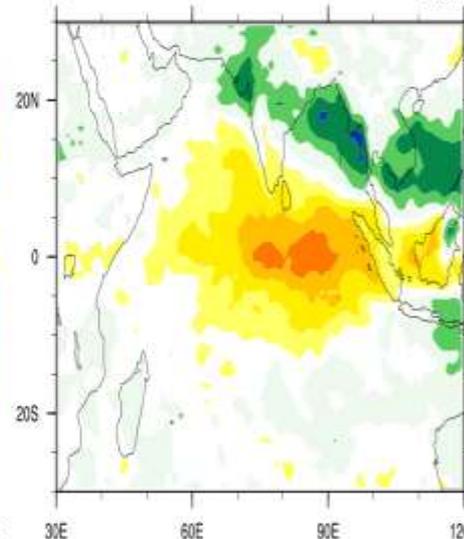
a) Correlation (OBS): SST & PRECIP'



b) SST (lag = 11 days) 24.3%



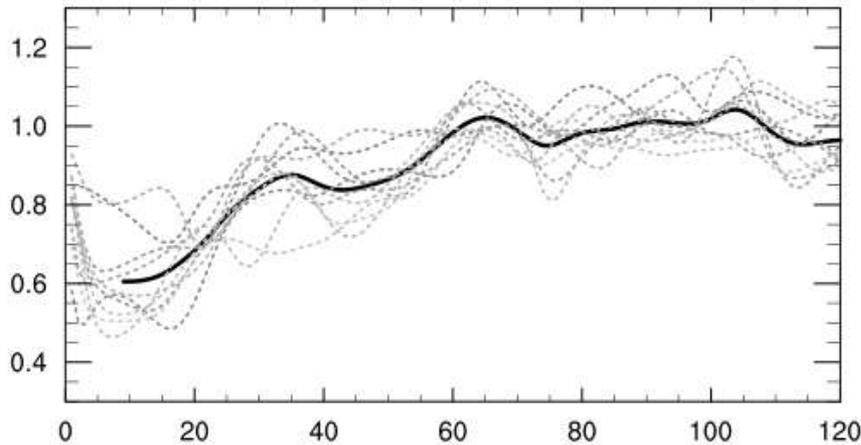
c) PRECIP. 24.3%



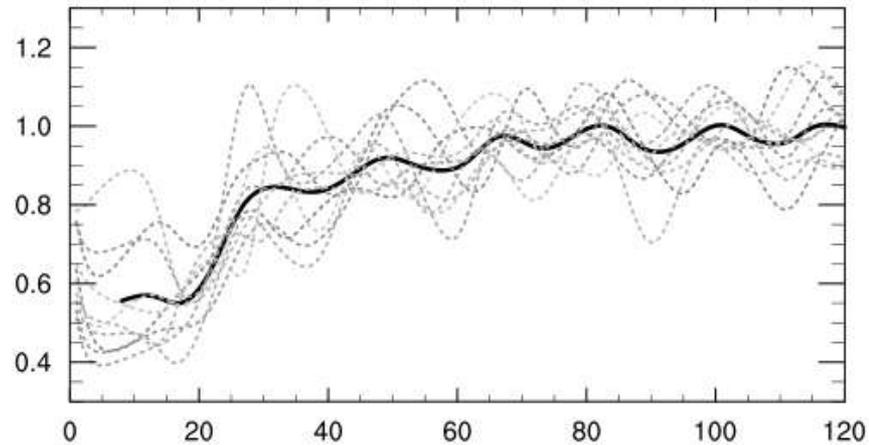
# Saturation RMSE: Coupled Modes

SSTA

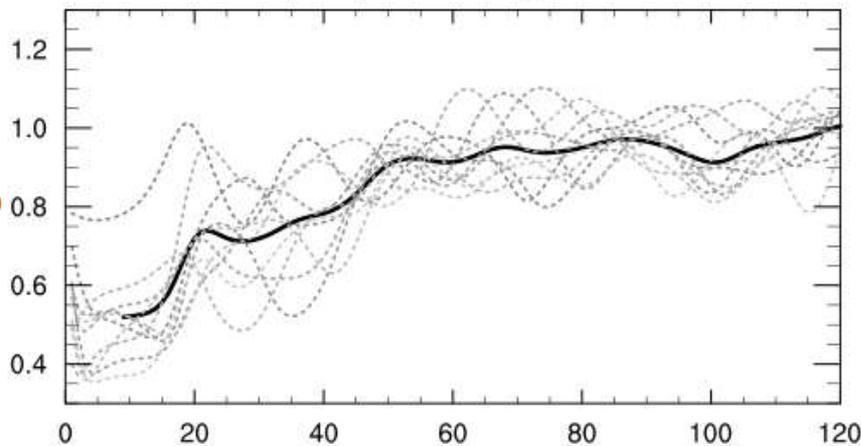
a) PC1 (All-time-leads) : atm.01



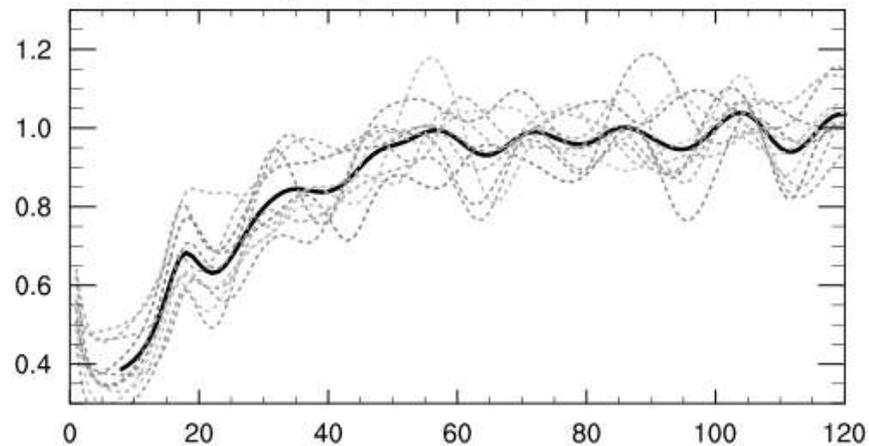
b) PC1 (All-time-leads) : atm.06



c) PC2 (All-time-leads) : atm.01



d) PC2 (All-time-leads) : atm.06



Precip