Analysis for new experiments

MJO during 20140501-20160526

3/27/2017

Experiments and Data

- Forecast system:
  - GEFSv11, 0-35 day forecast;
  - T574 (33 km) for 0-8 days, T382 (55km) after 8days.

- Experiments:
  - STTP with control version of SST
  - SPPT+SHUM+SKEB (SPs) with control version of SST;
  - SPs with bias corrected CFSv2 forecast SST;
  - SPs with bias corrected CFSv2 forecast SST and NSST;
  - All experiment cover the period of 20140501-20160526, 5-day interval.

- Analysis data:
  - GDAS during 20140101-20161031

- Both forecast and analysis data using daily mean

# WH-MJO Forecast Skills for 2-yr Experiments
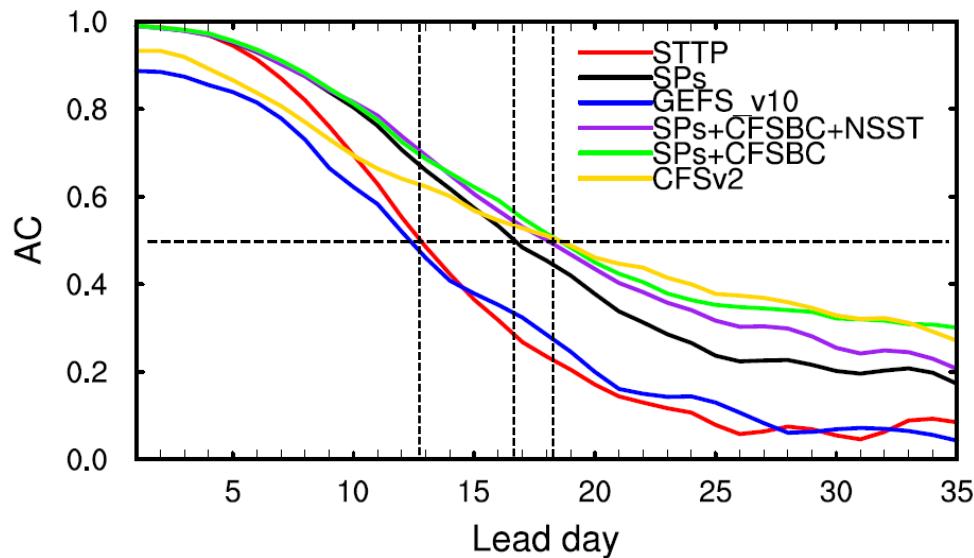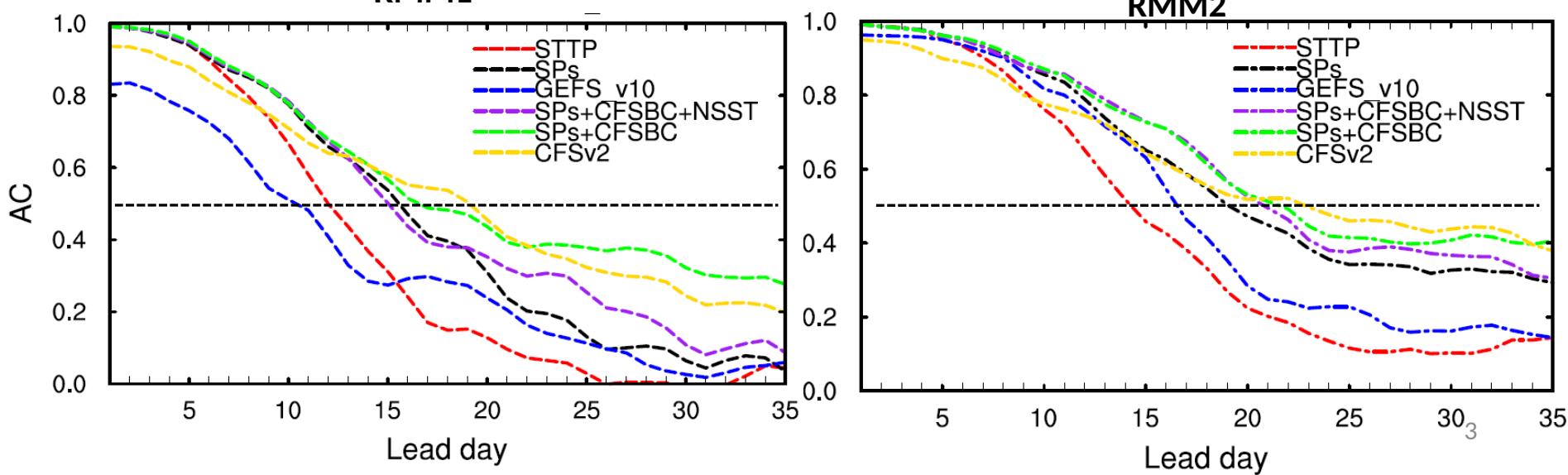
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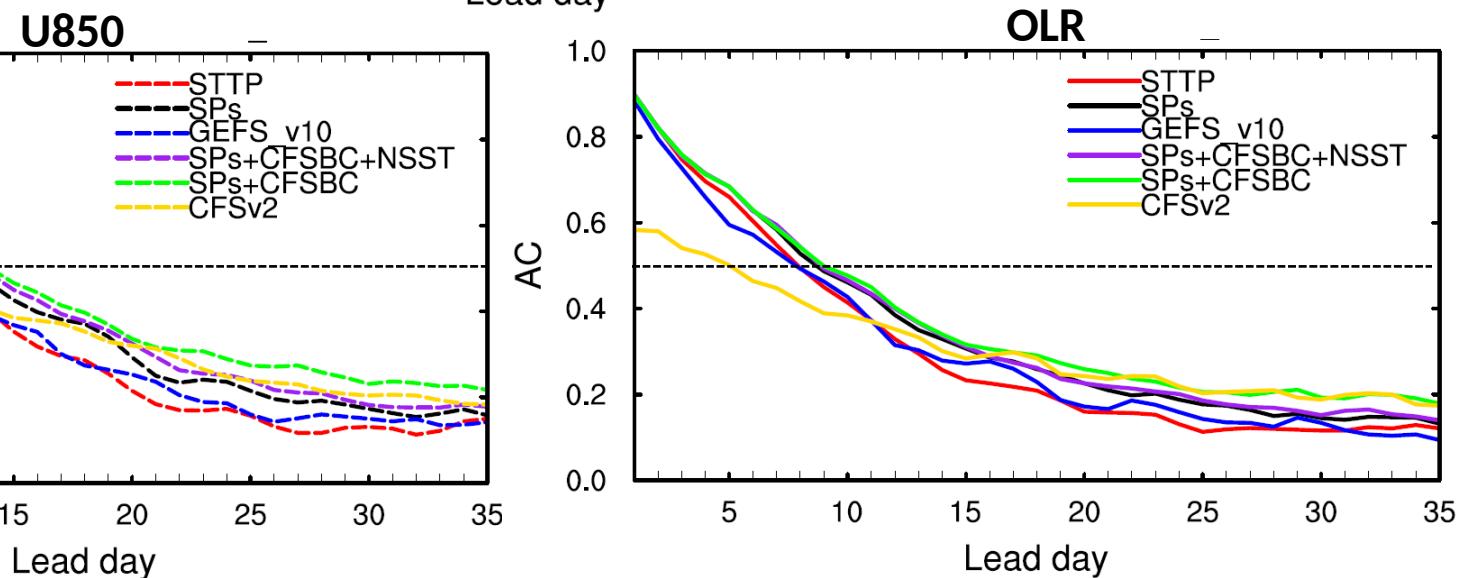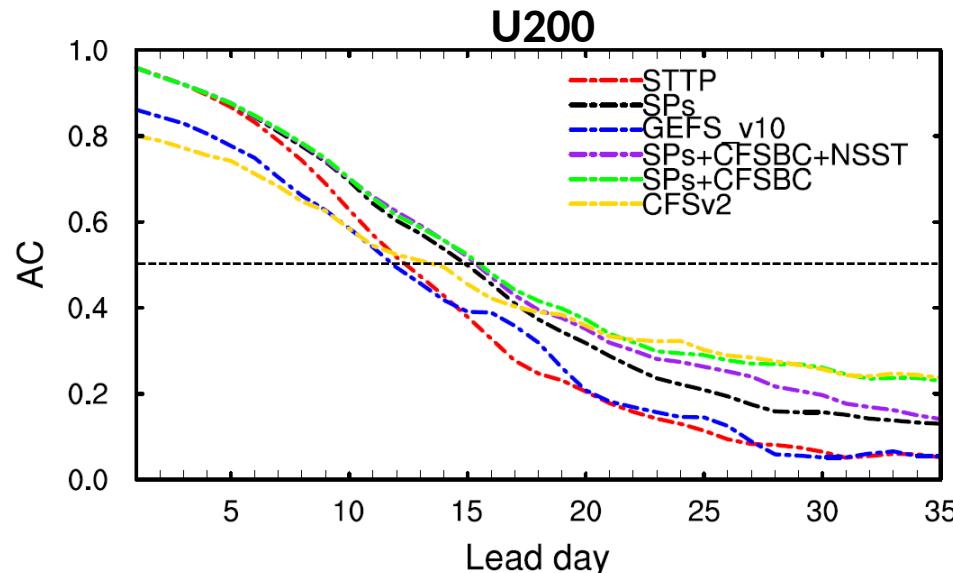
Strong vs Weak Period

MJO skill: RMM1+RMM2 1405-1503(w) vs 1504-1603(s)

Legend:
- STTP_s
- SPs_s
- SPs+CFSBC+NSST_s
- CFSv2_s
- STTP_w
- SPs_w
- SPs+CFSBC+NSST_w
- SPs+CFSBC_w
- CFSv2_w
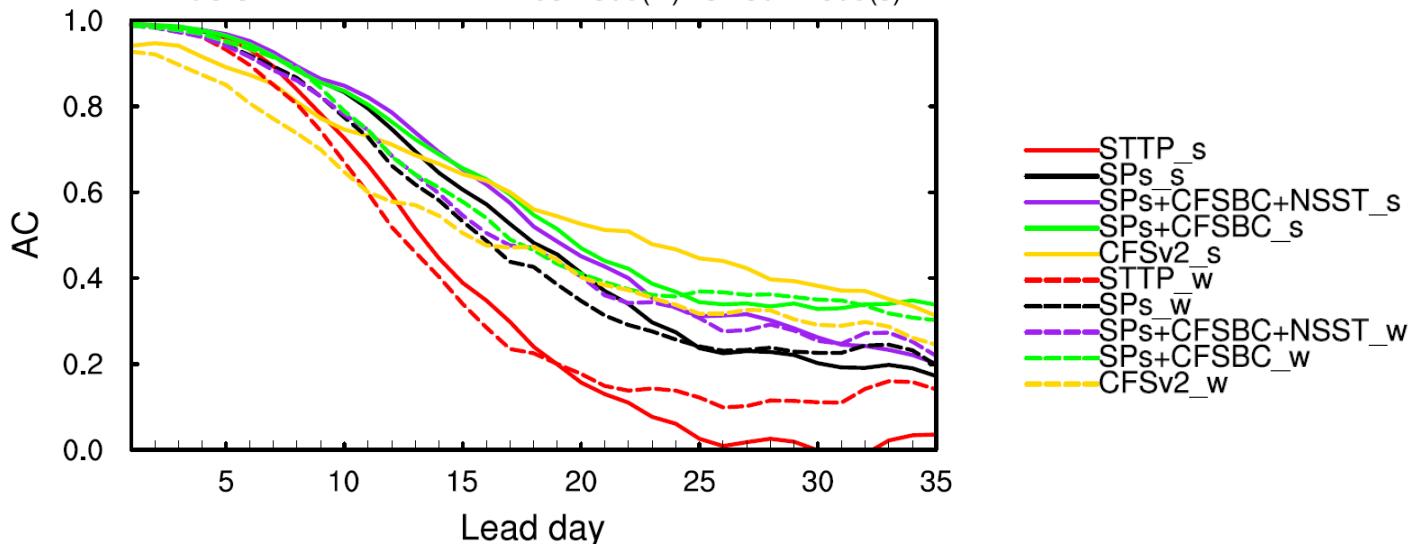
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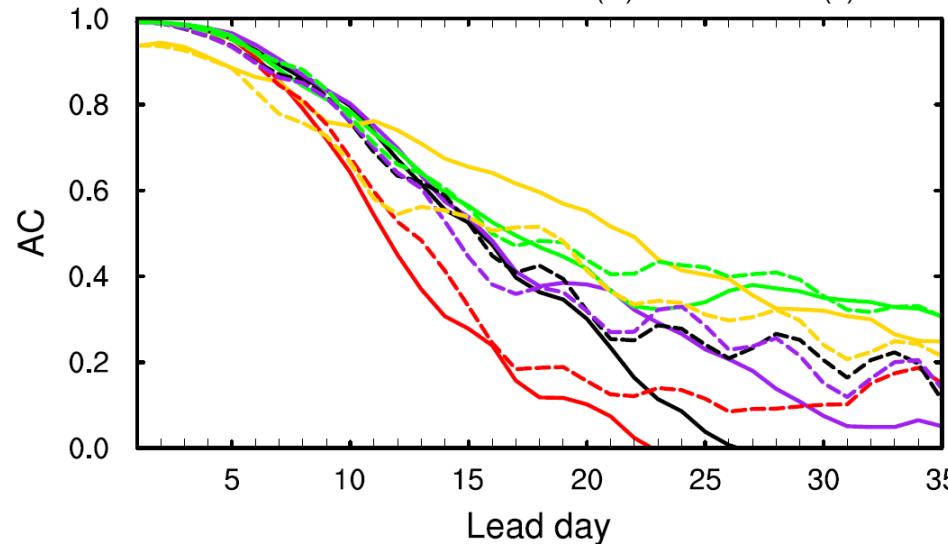
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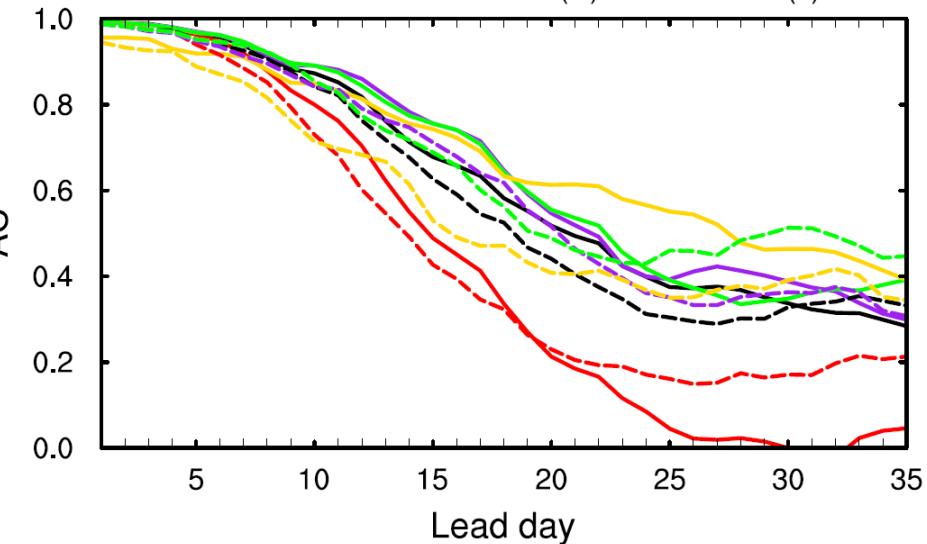
MJO index
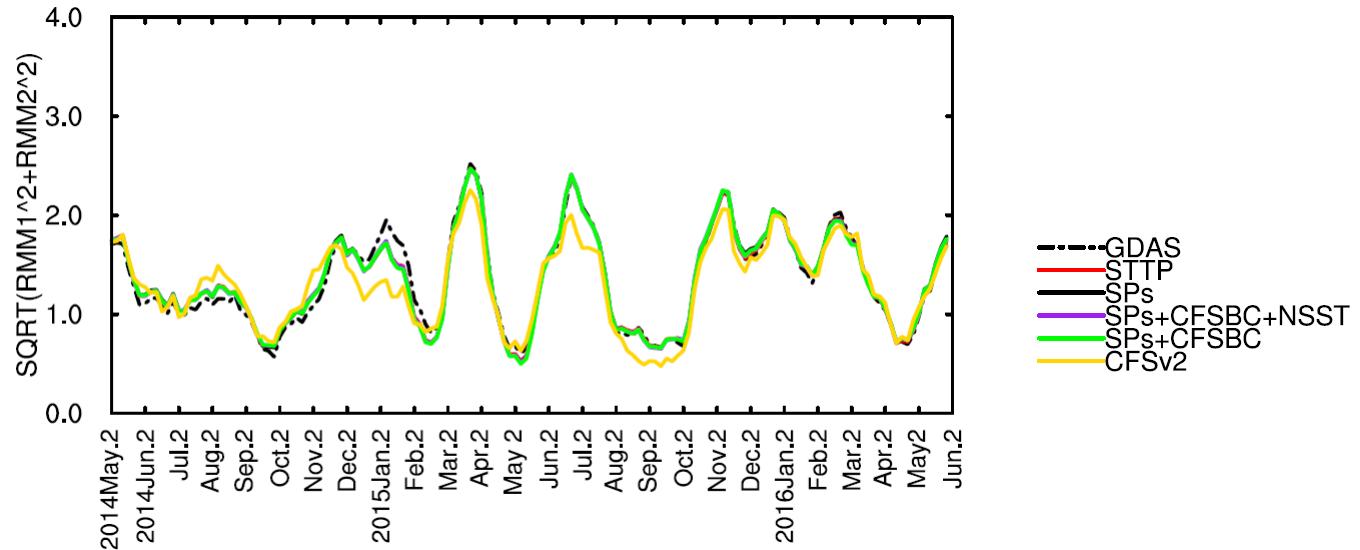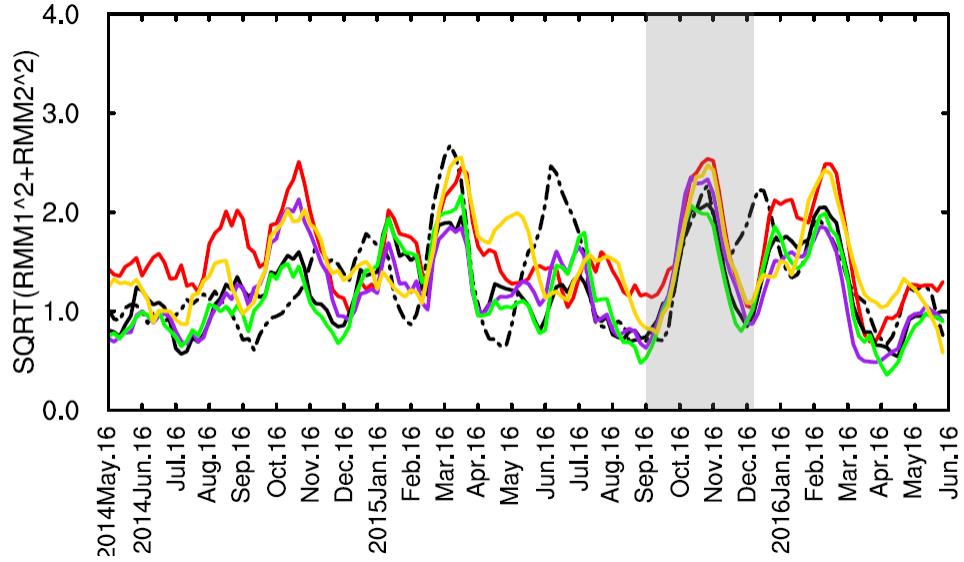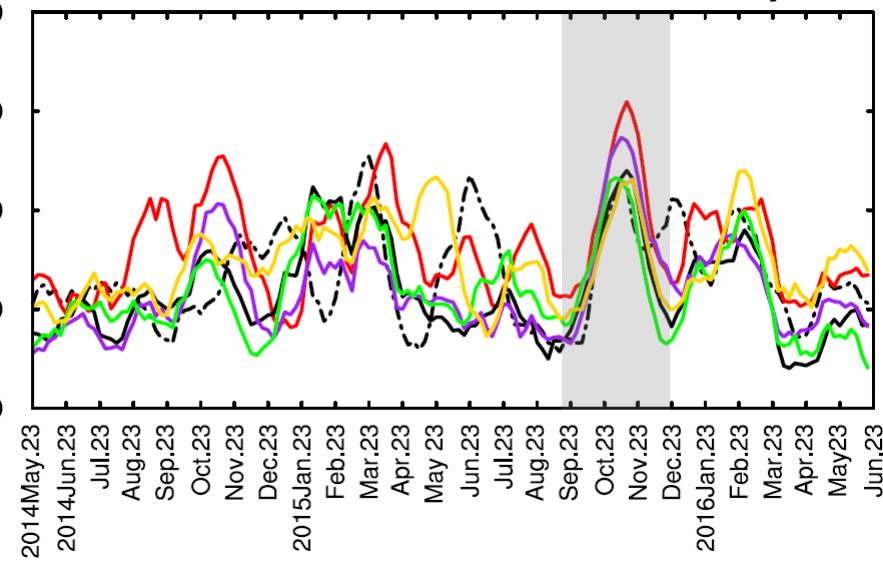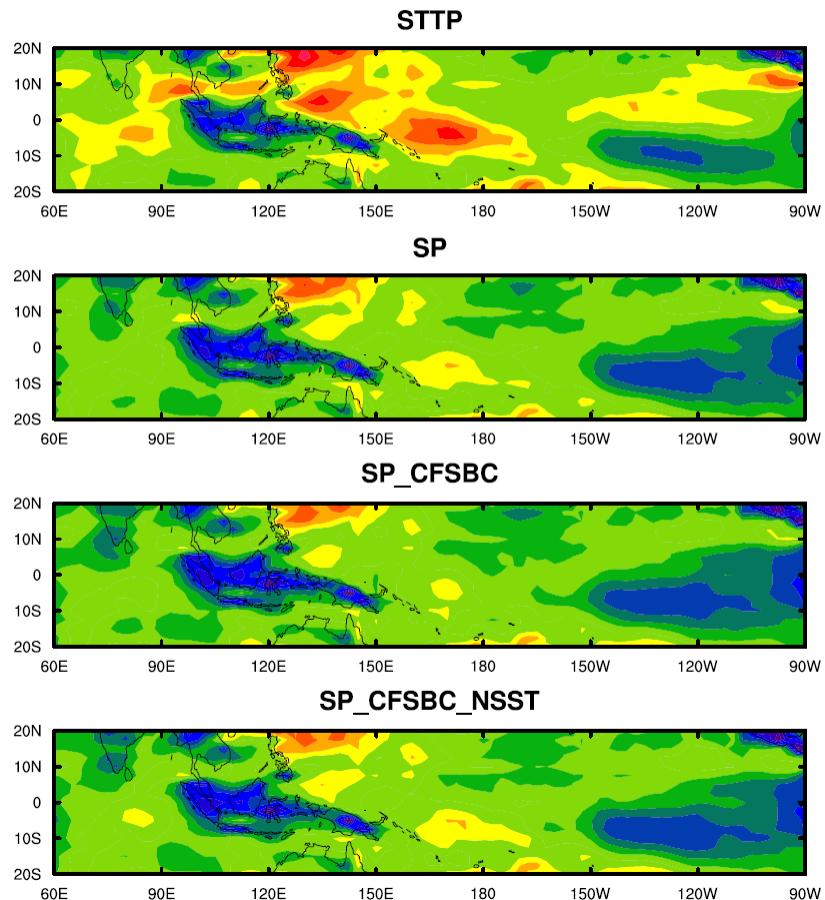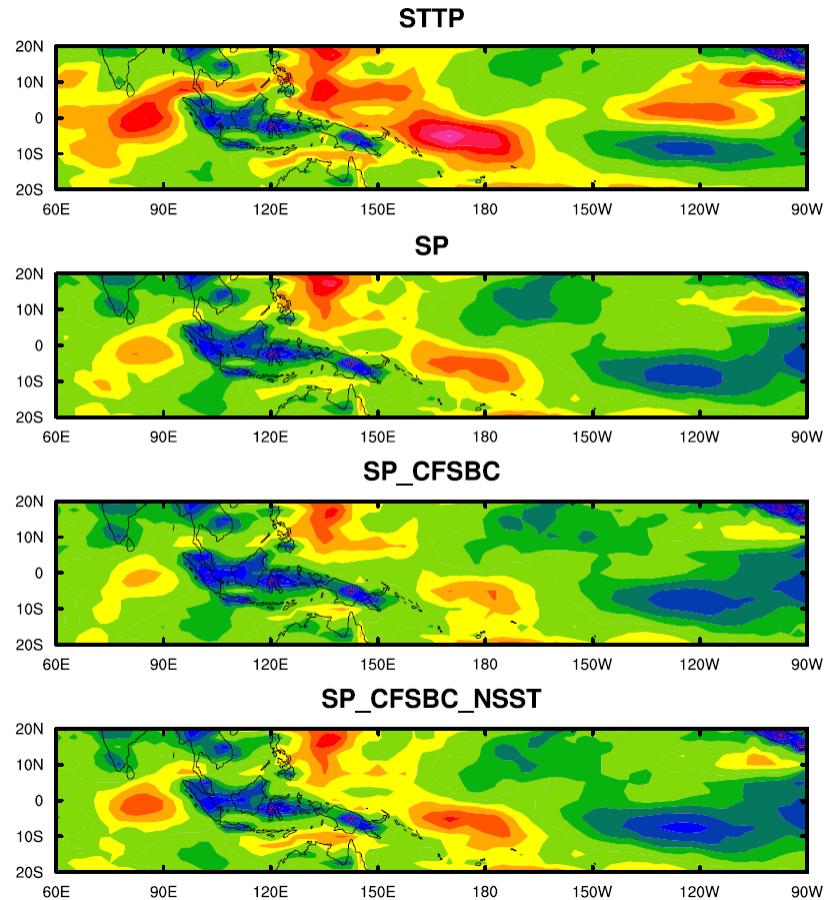
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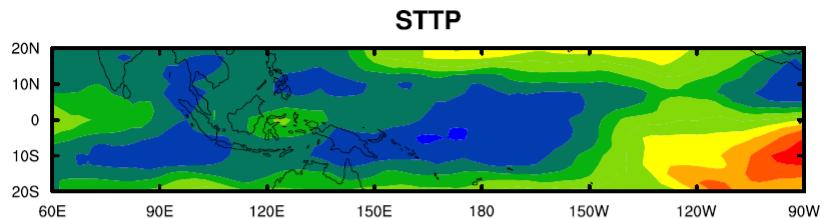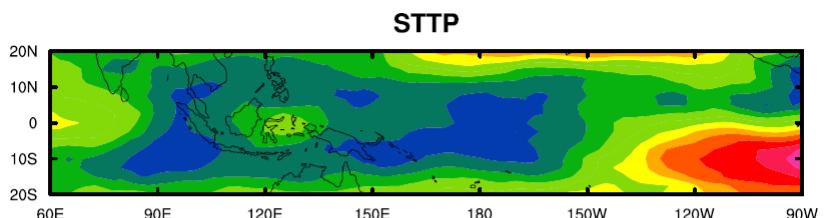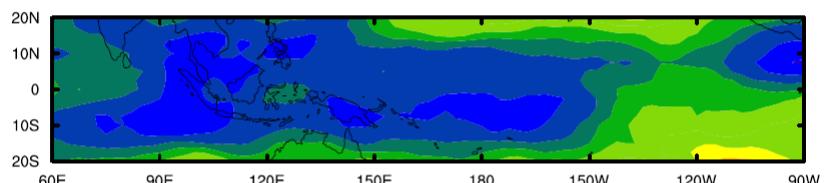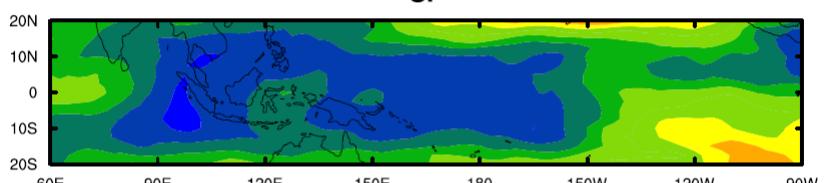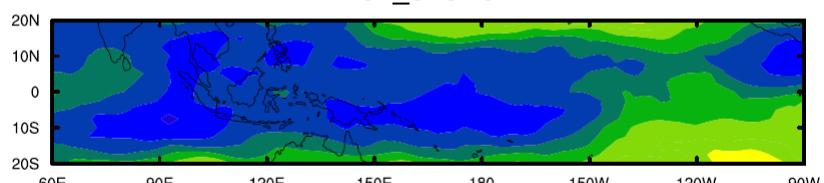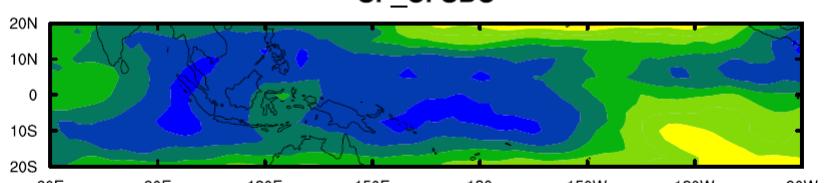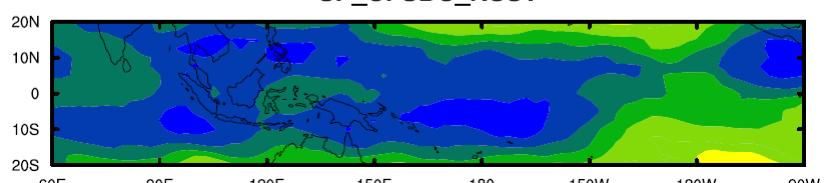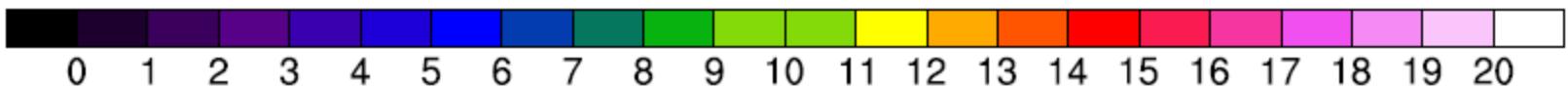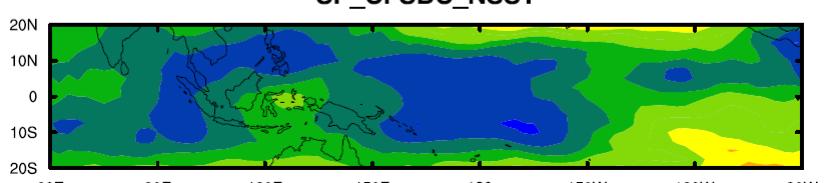
RMSE Map: U200

RMSE Map: OLR
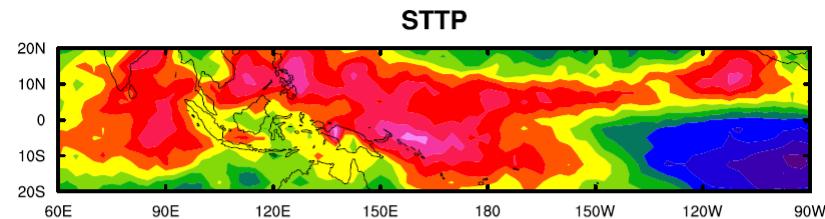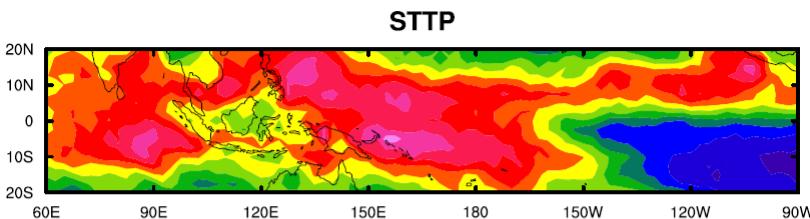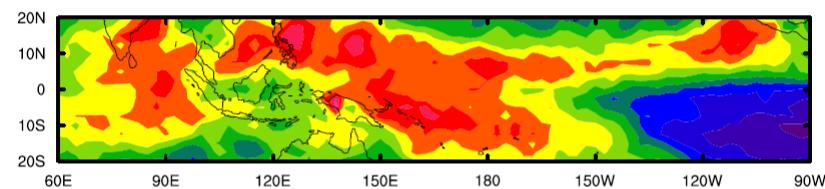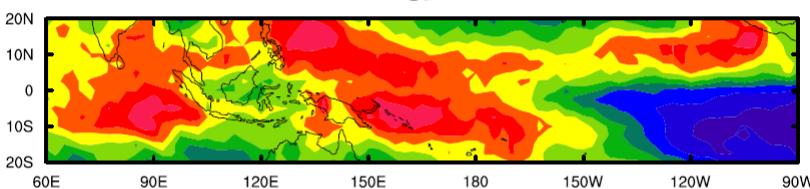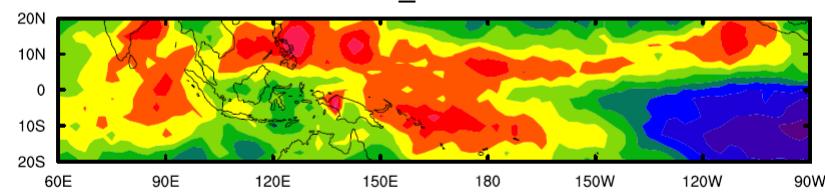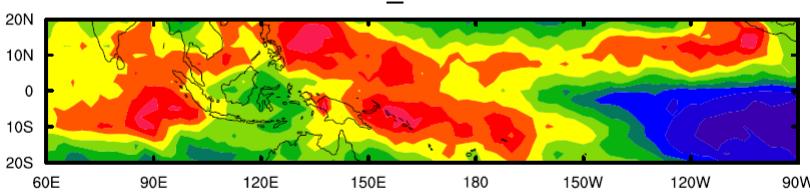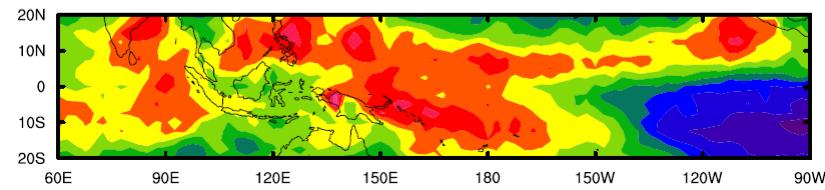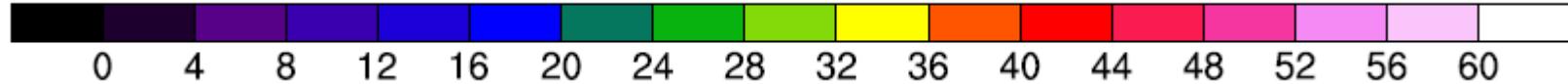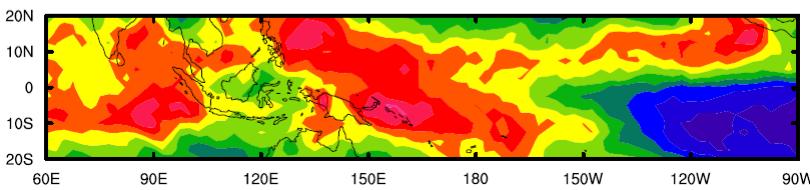
RMSE as a function of lead time
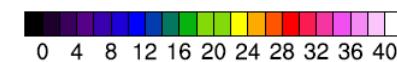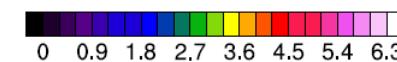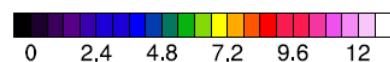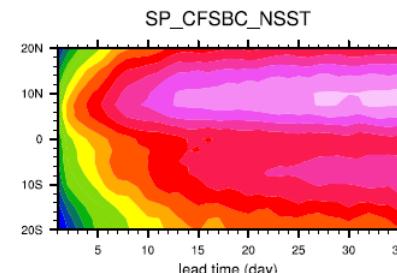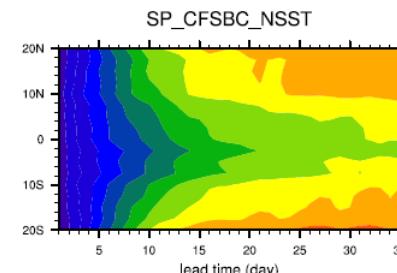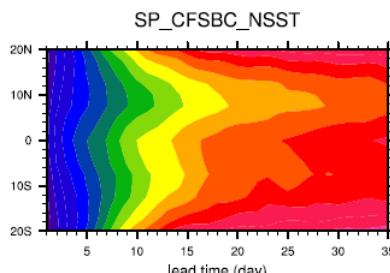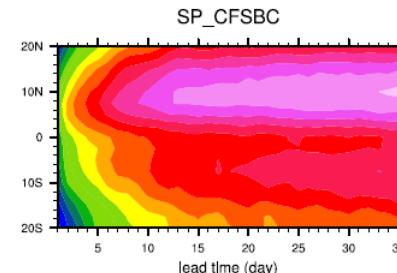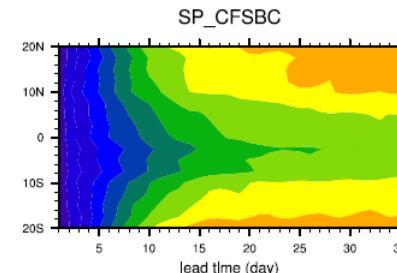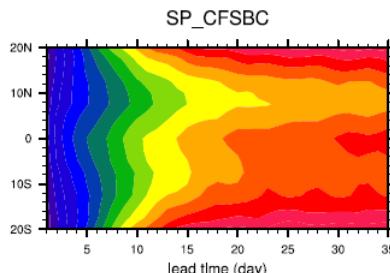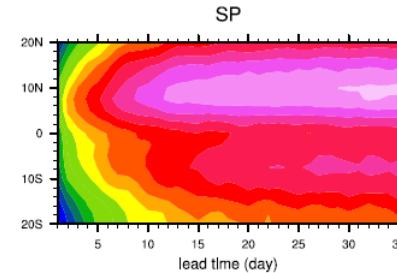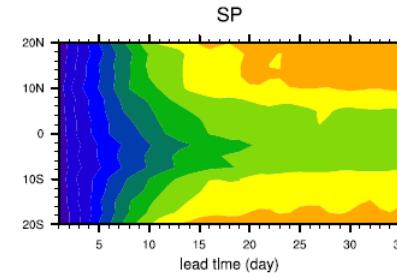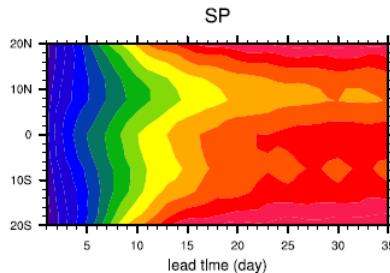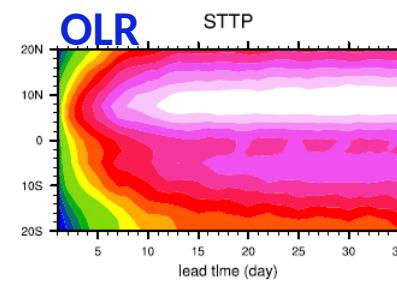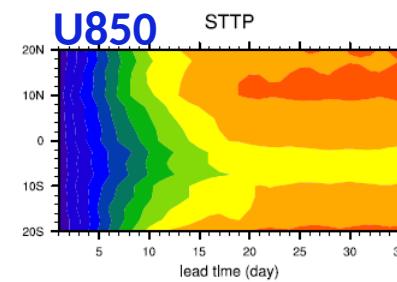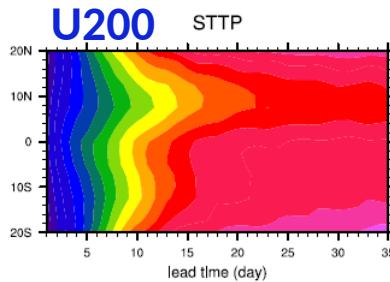
MJO Composite: U200

lead day= 15 phase=5
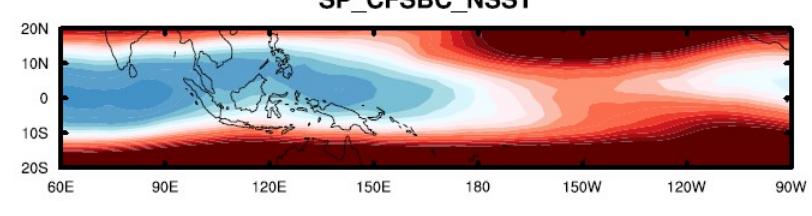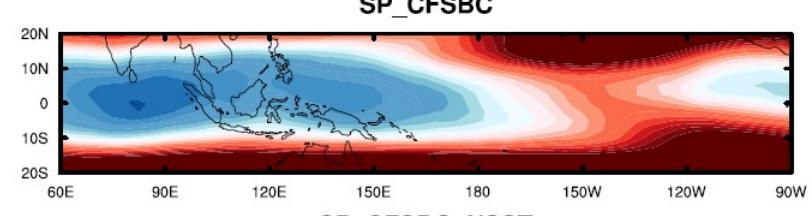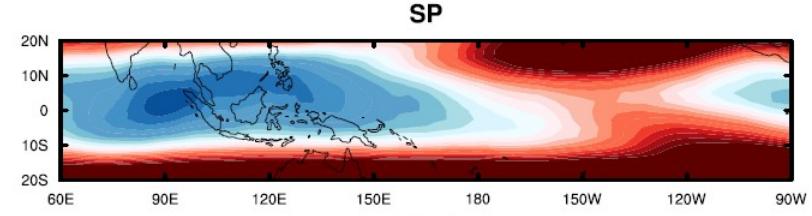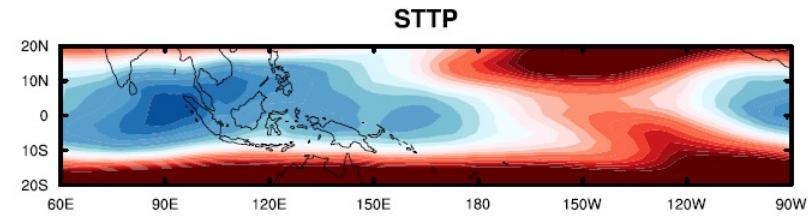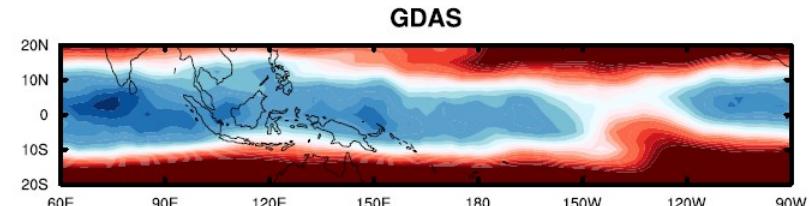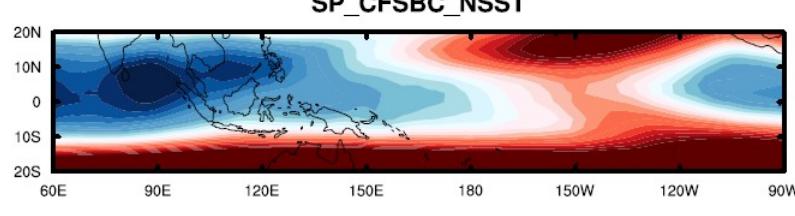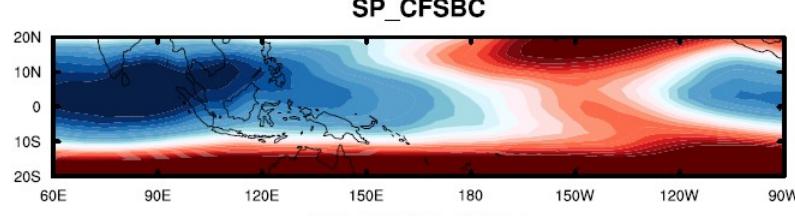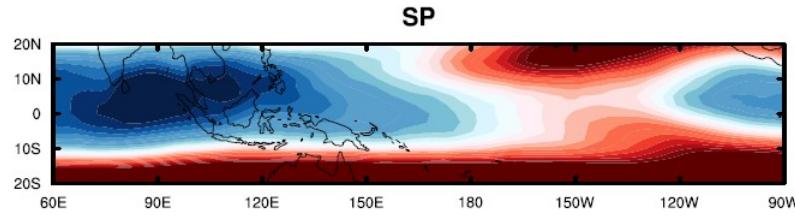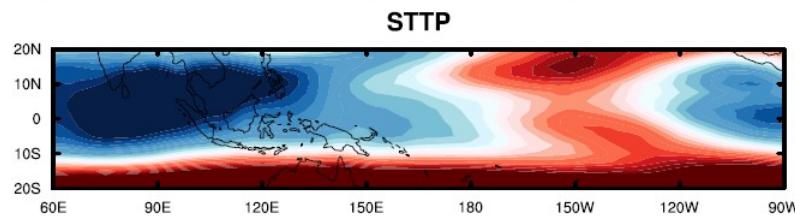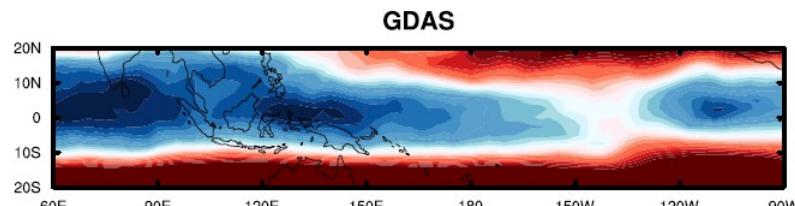
lead day= 22 phase=5

MJO Composite: U200 Bias

Bias: lead day= 15 phase=5
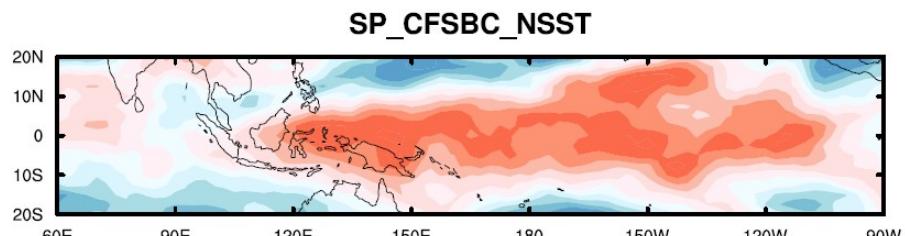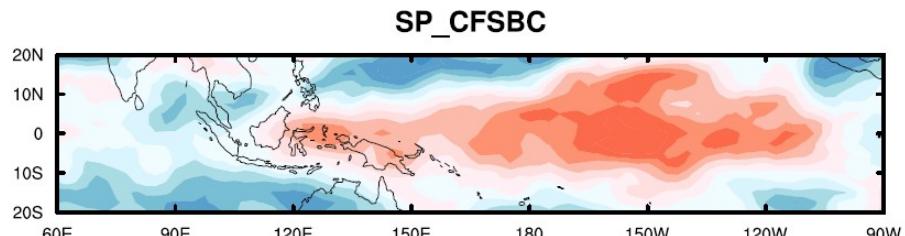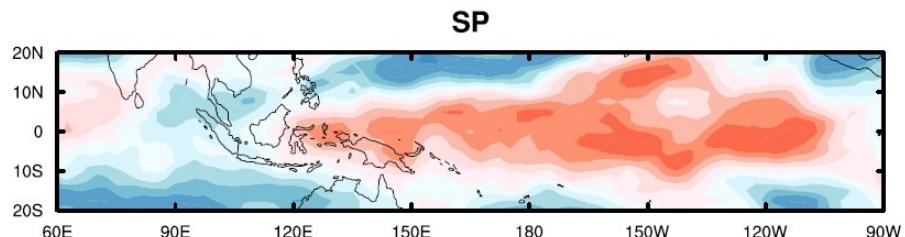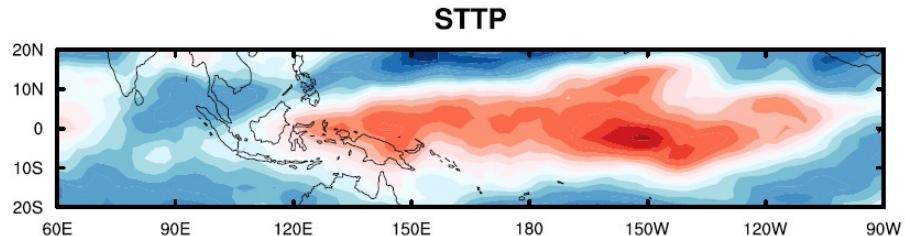
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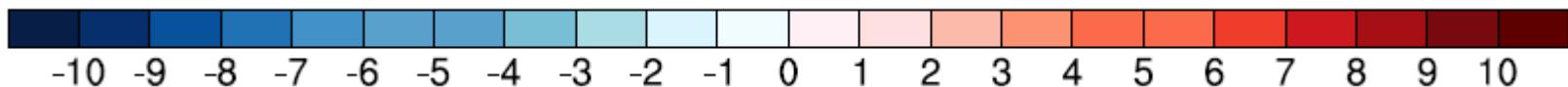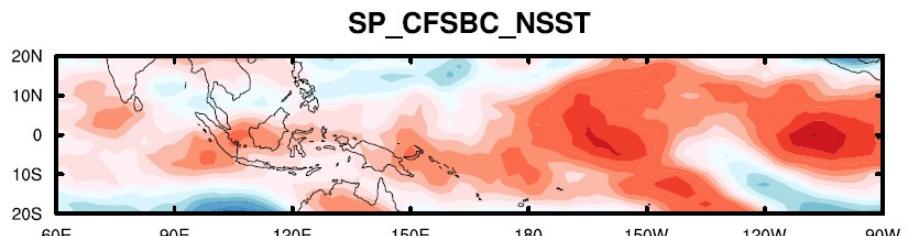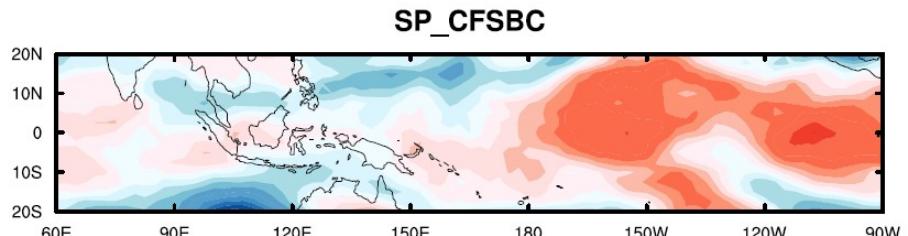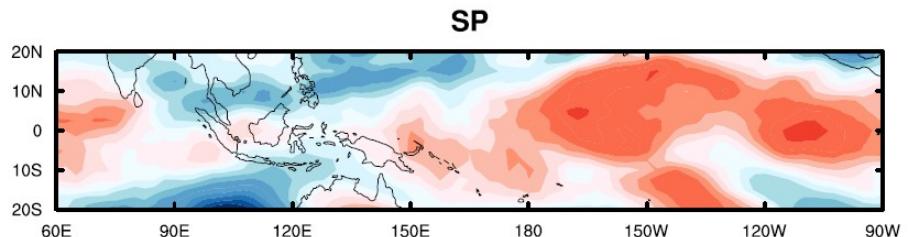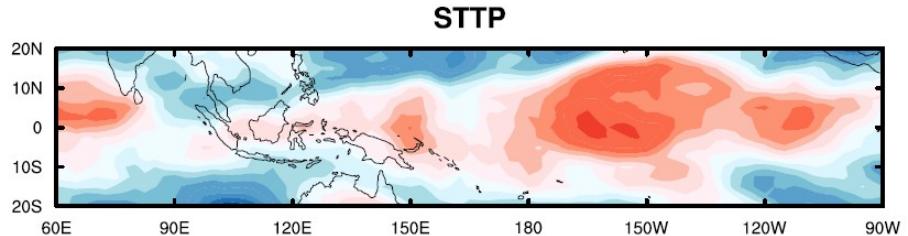
MJO Composite: U850

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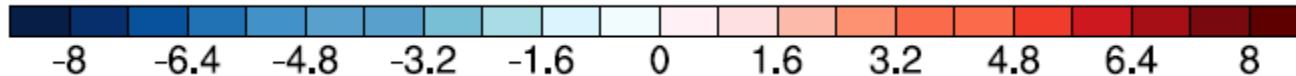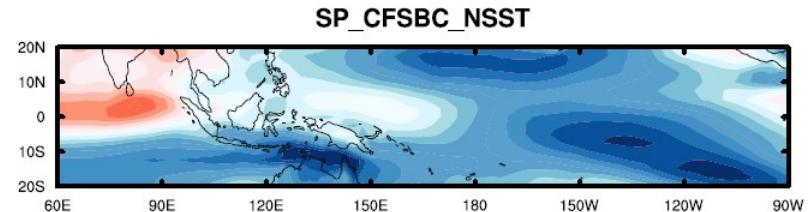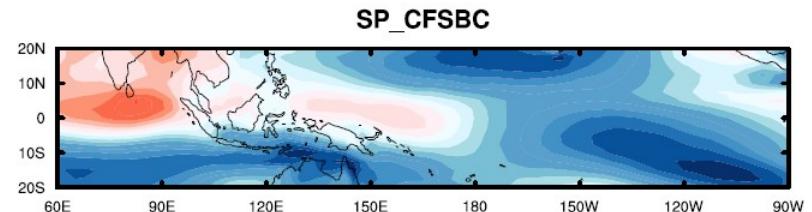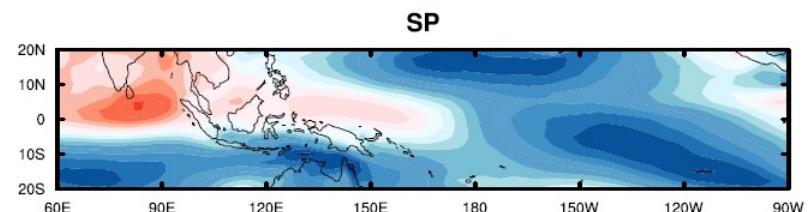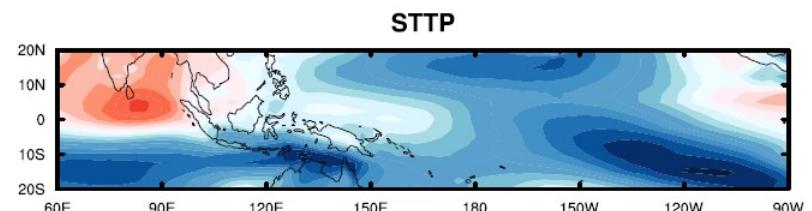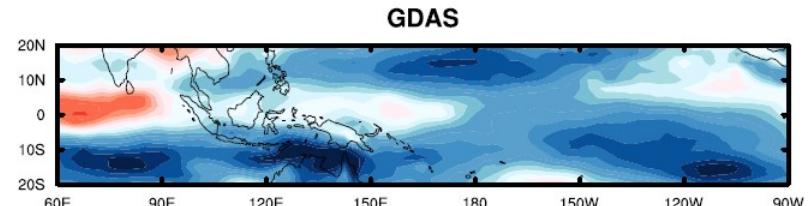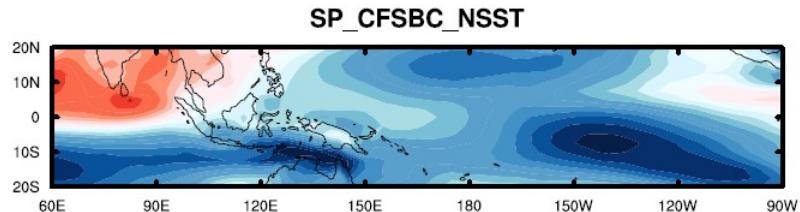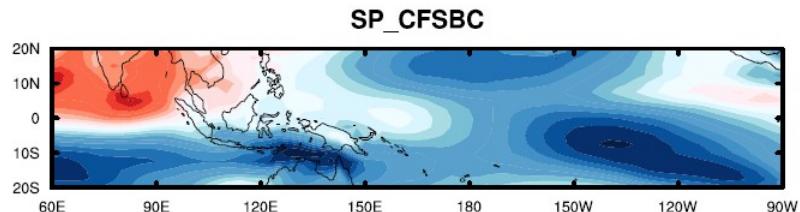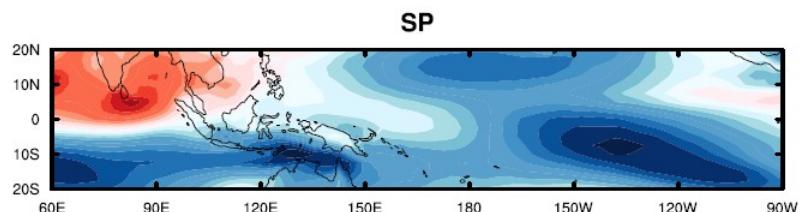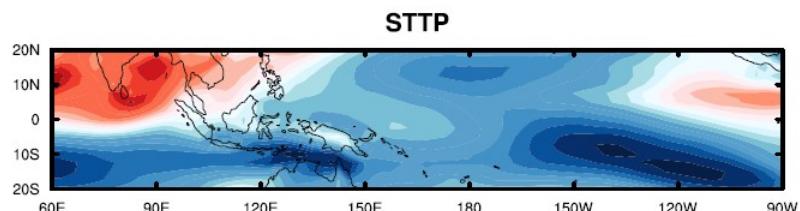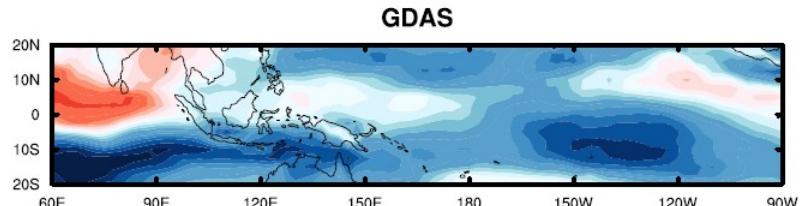
lead day= 22 phase=5

MJO Composite: U850 Bias

Bias: lead day= 15 phase=5
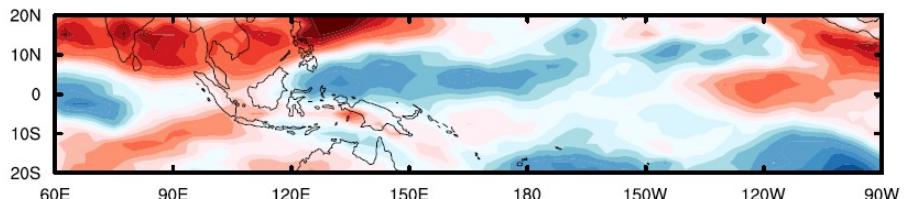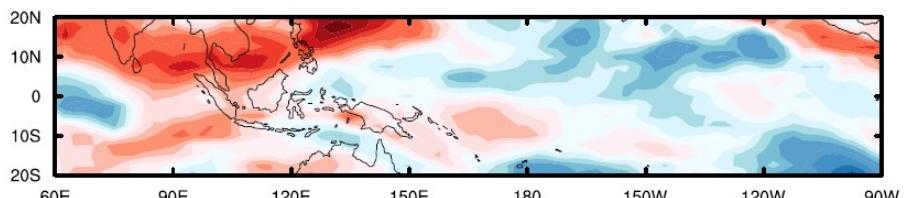
Bias: lead day= 22 phase=5

STTP

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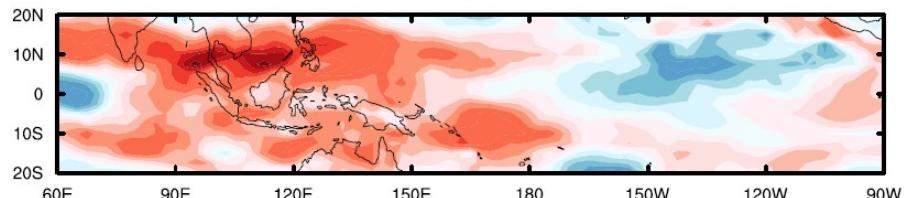
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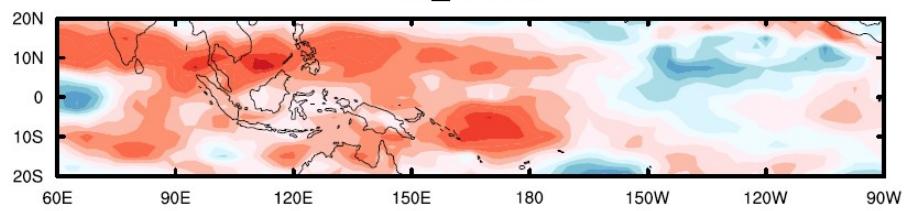
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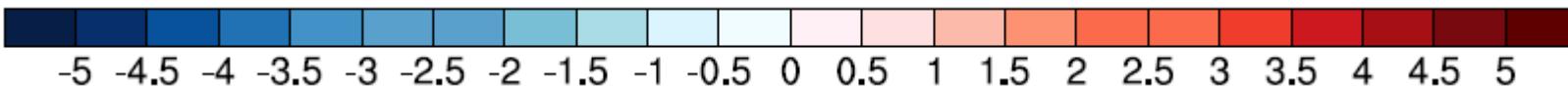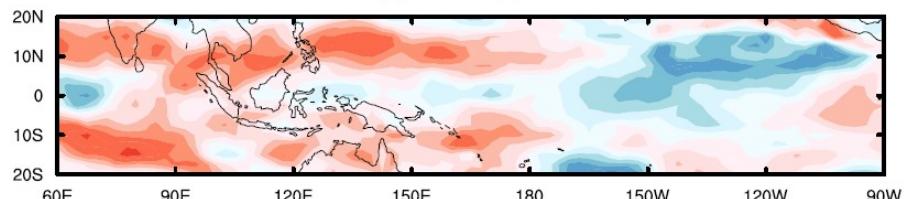
MJO Composite: OLR

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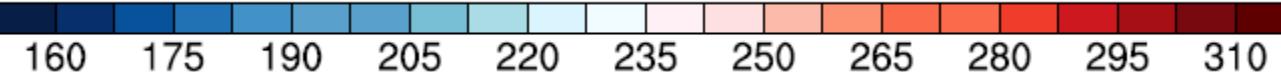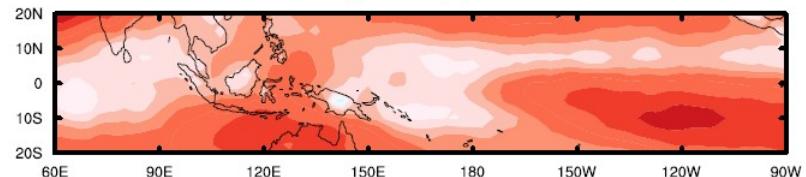
lead day= 22 phase=5

# MJO Composite: OLR Bias


Bias: lead day= 15 phase=5
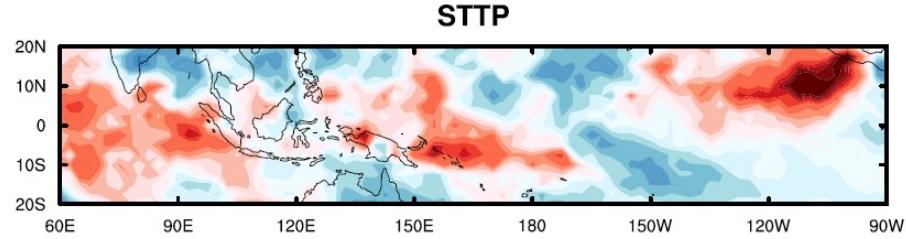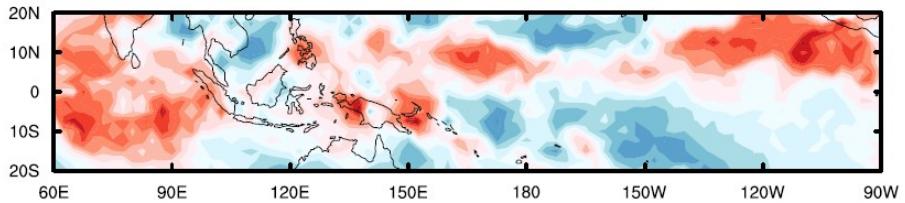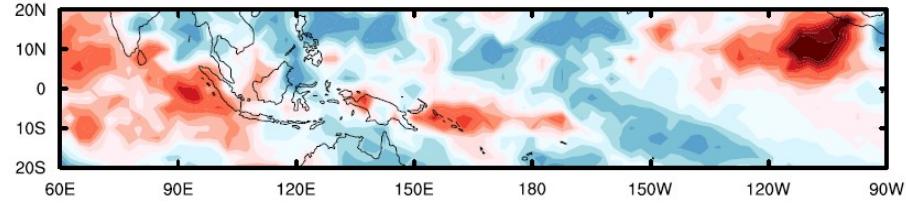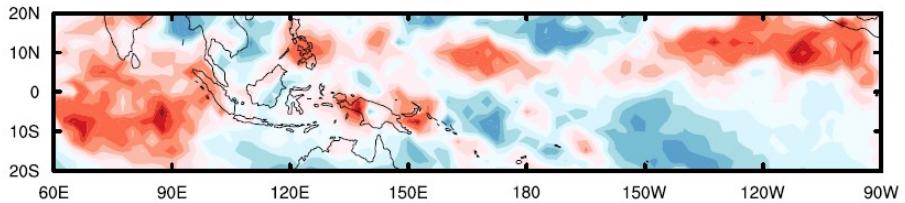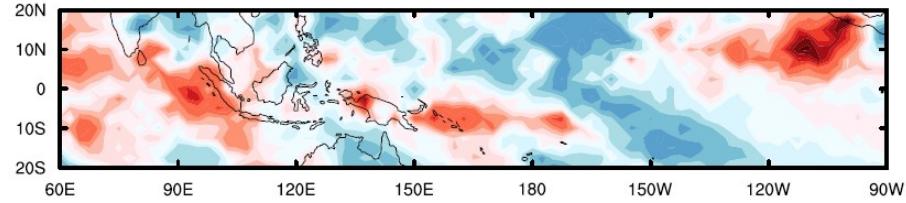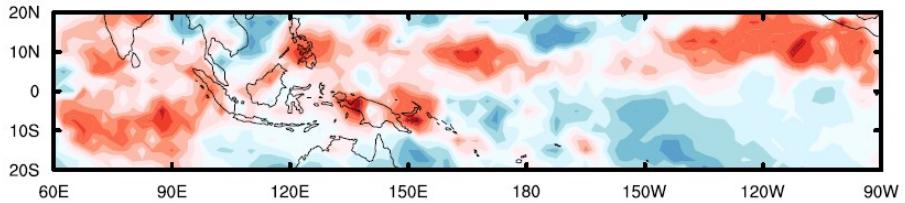
Bias: lead day= 22 phase=5
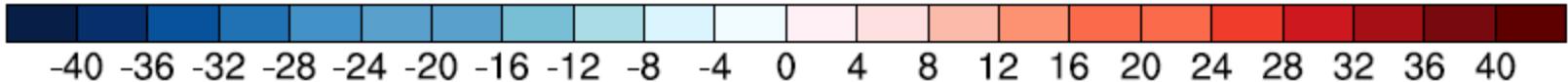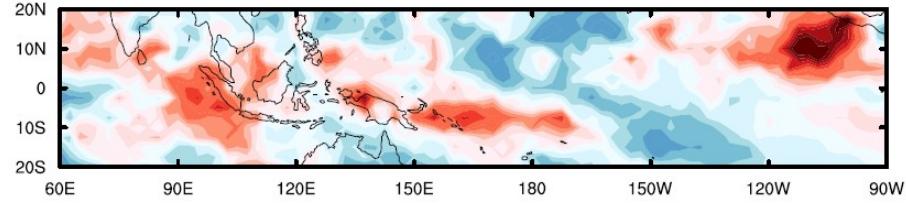
Composite MJO phase: OLR anomaly (Lead day=7)
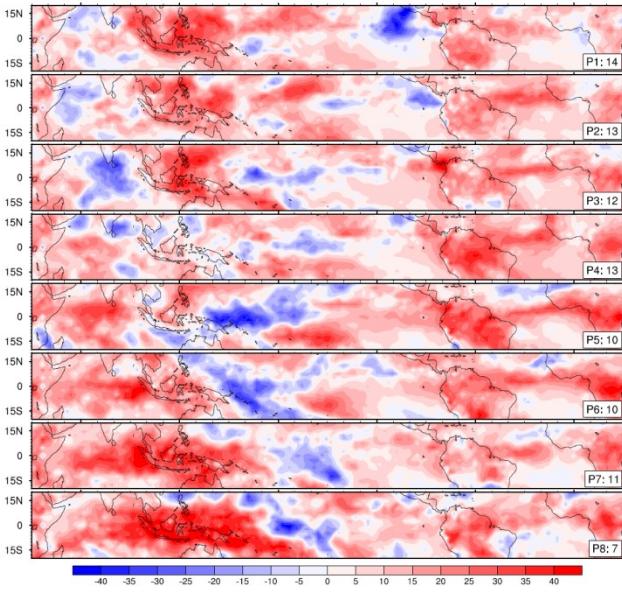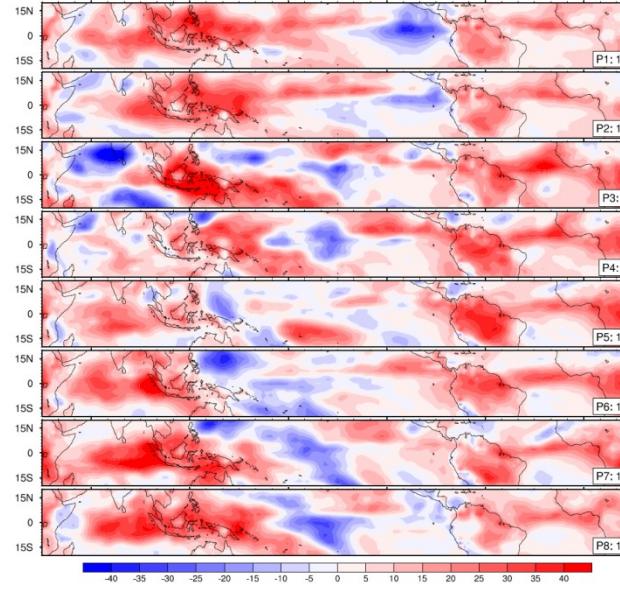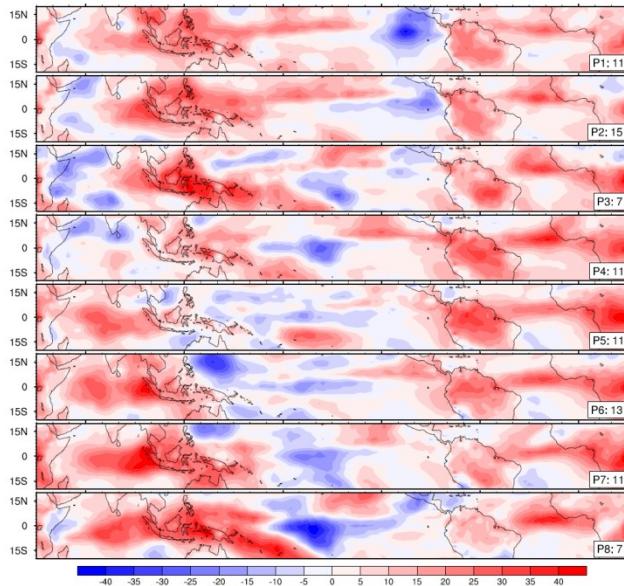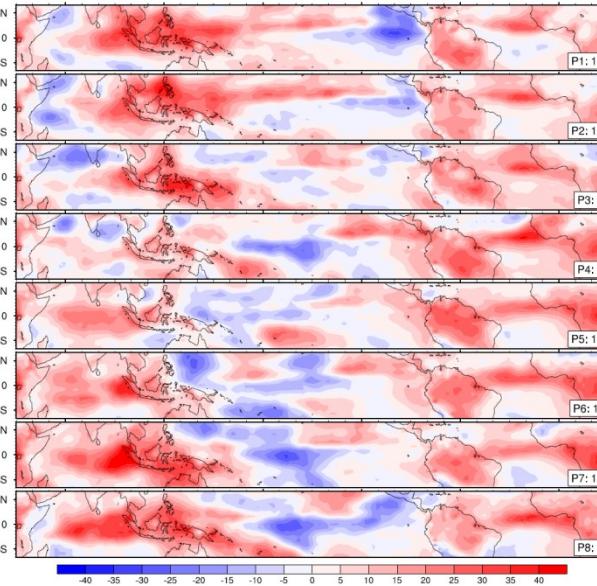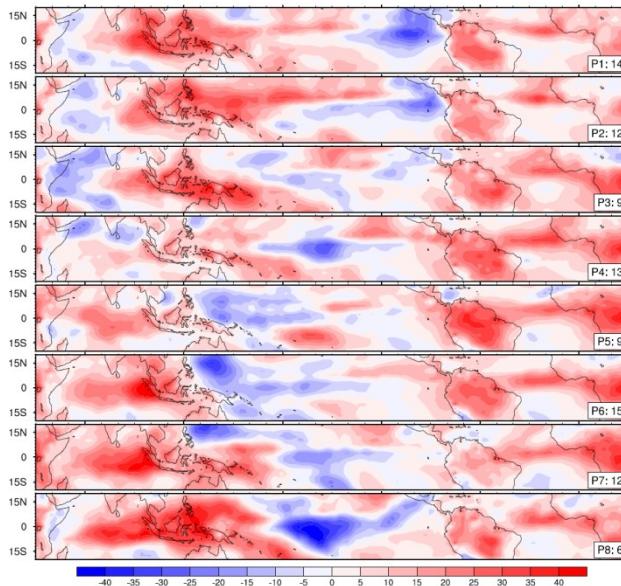
# Composite MJO phase: OLR anomaly (Lead day=14)
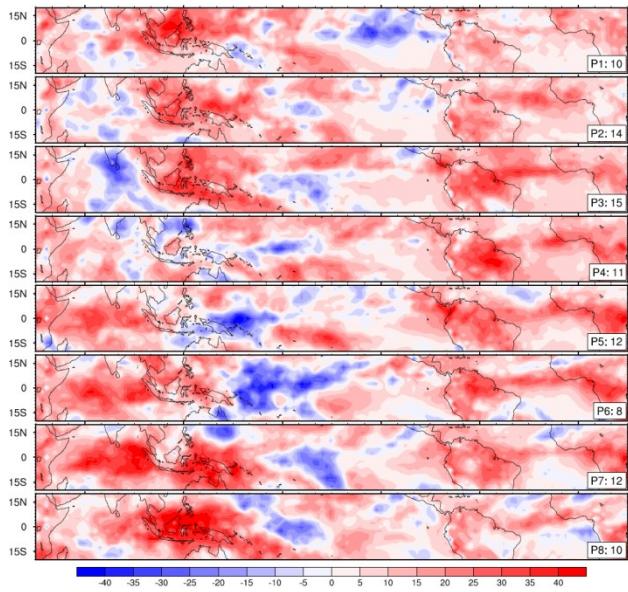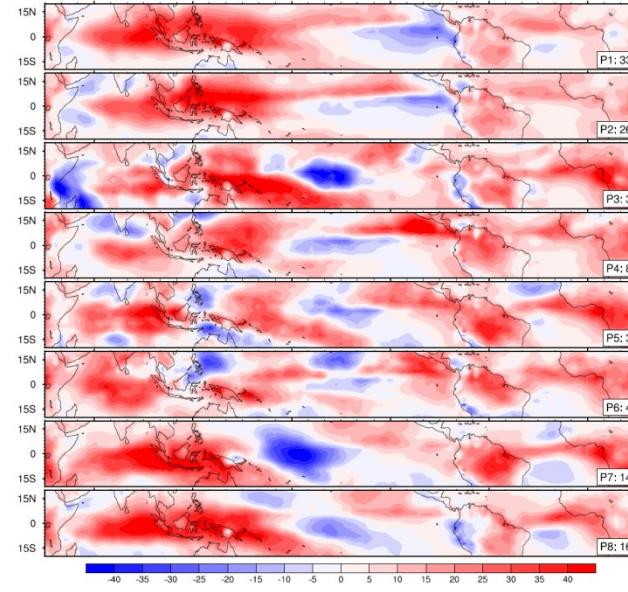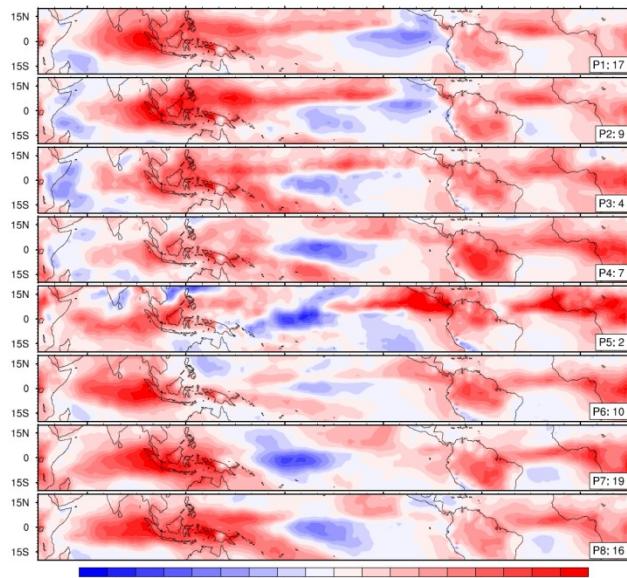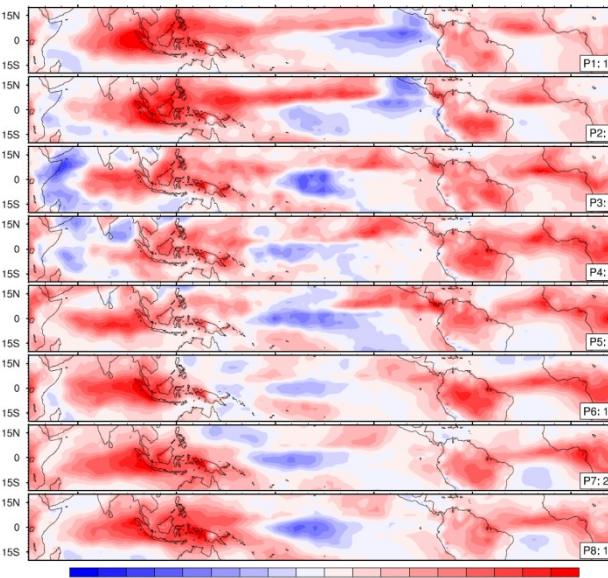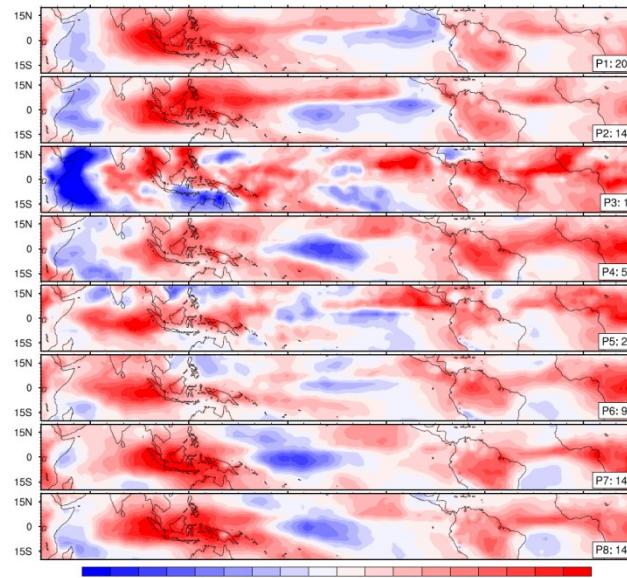
Composite MJO phase: OLR anomaly (Lead day=21)
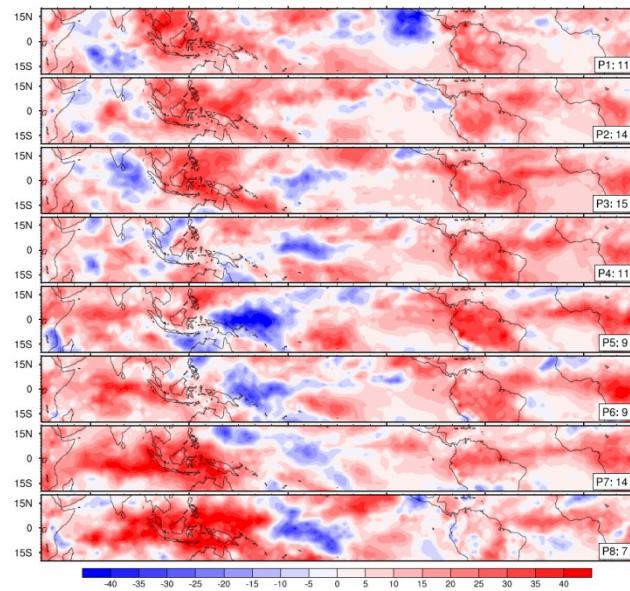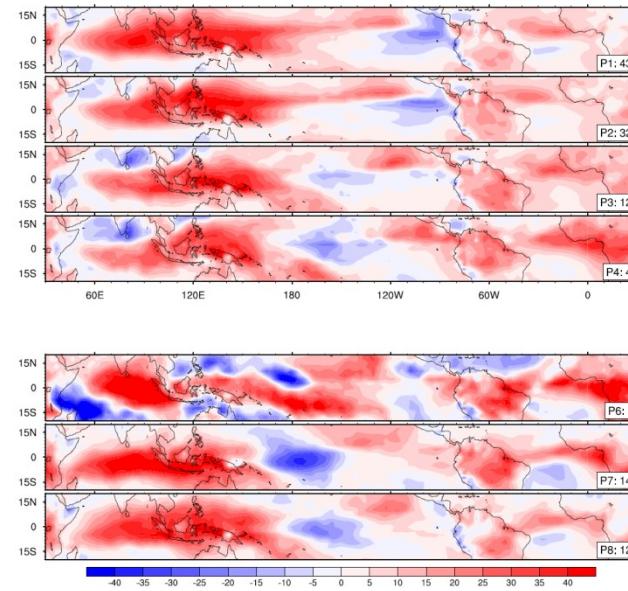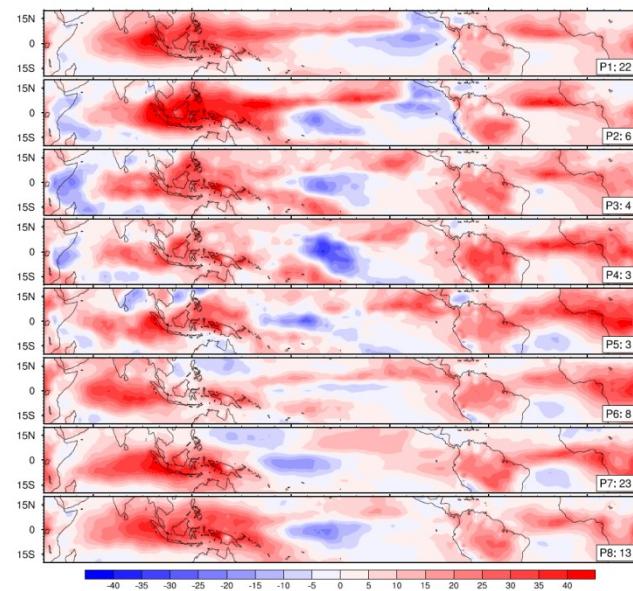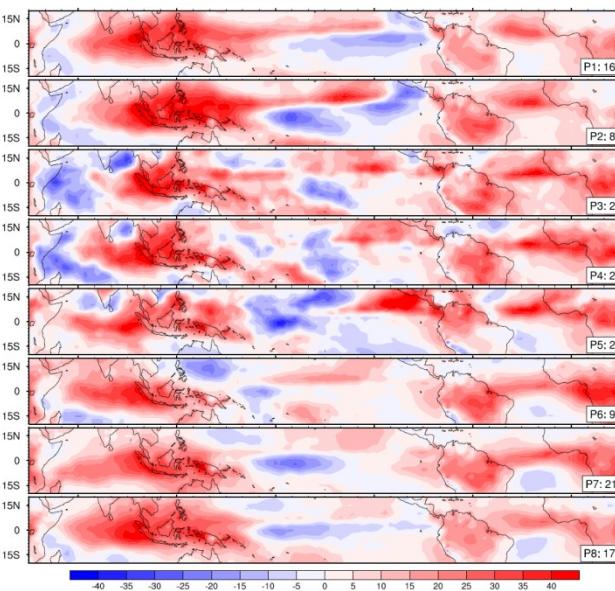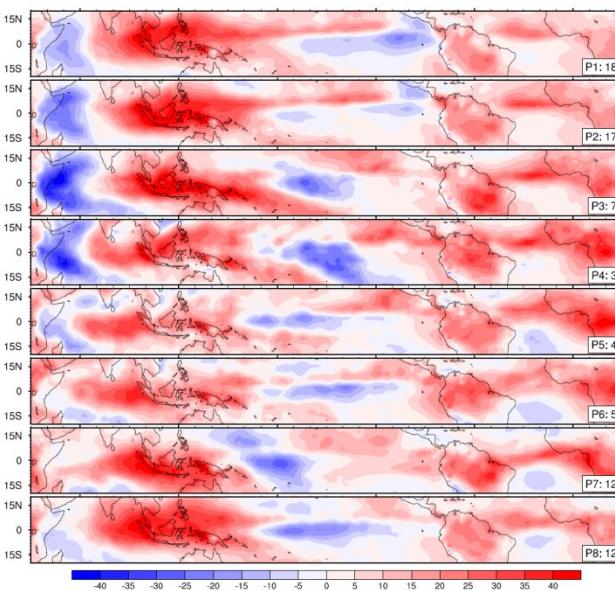
MJO skill: Ensemble mean vs each member
(SPs case)

WH-MJO Forecast Skills: Ensemble mean vs each member

MJO skill (SPs CTL): RMM1+RMM2
20151201-20160226
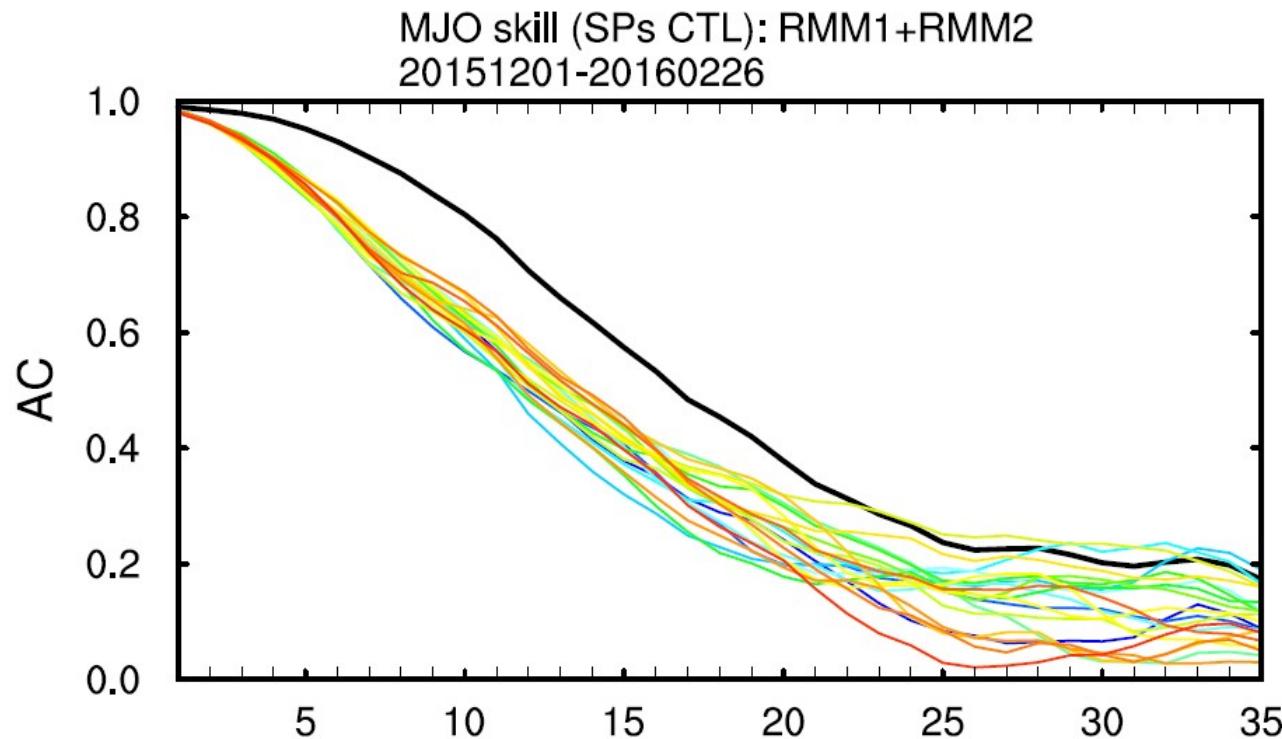
Contribution of Variables
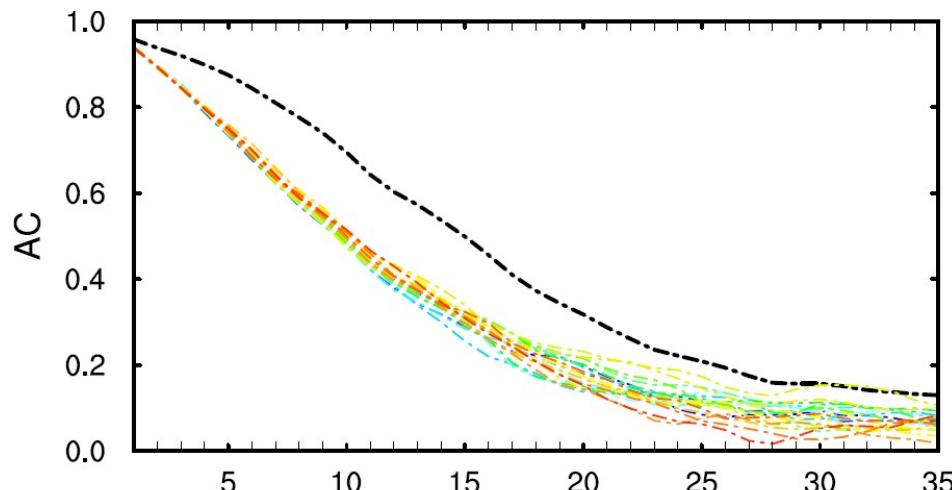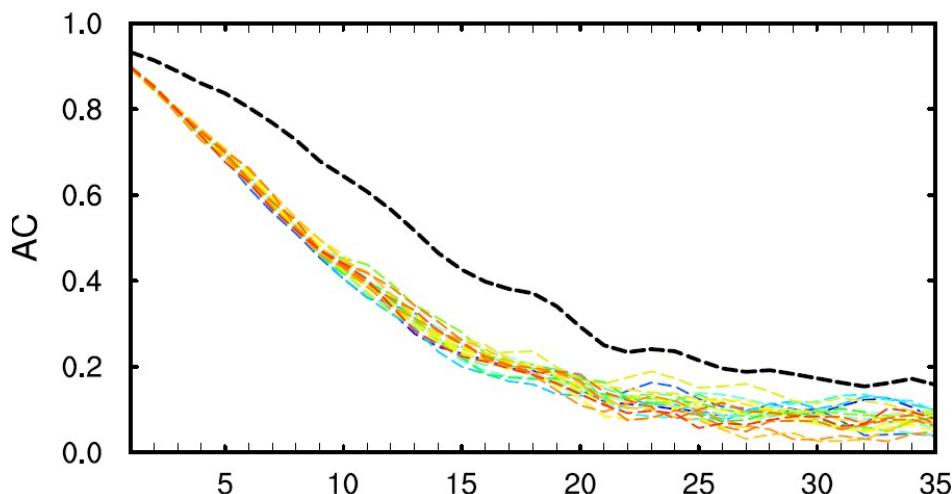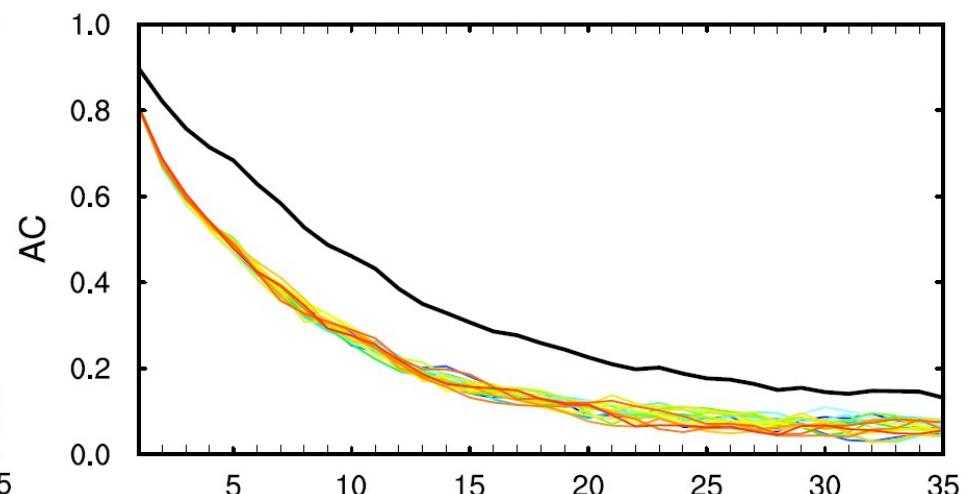
24 hr APCP (Lead day=7), 2yr ave.
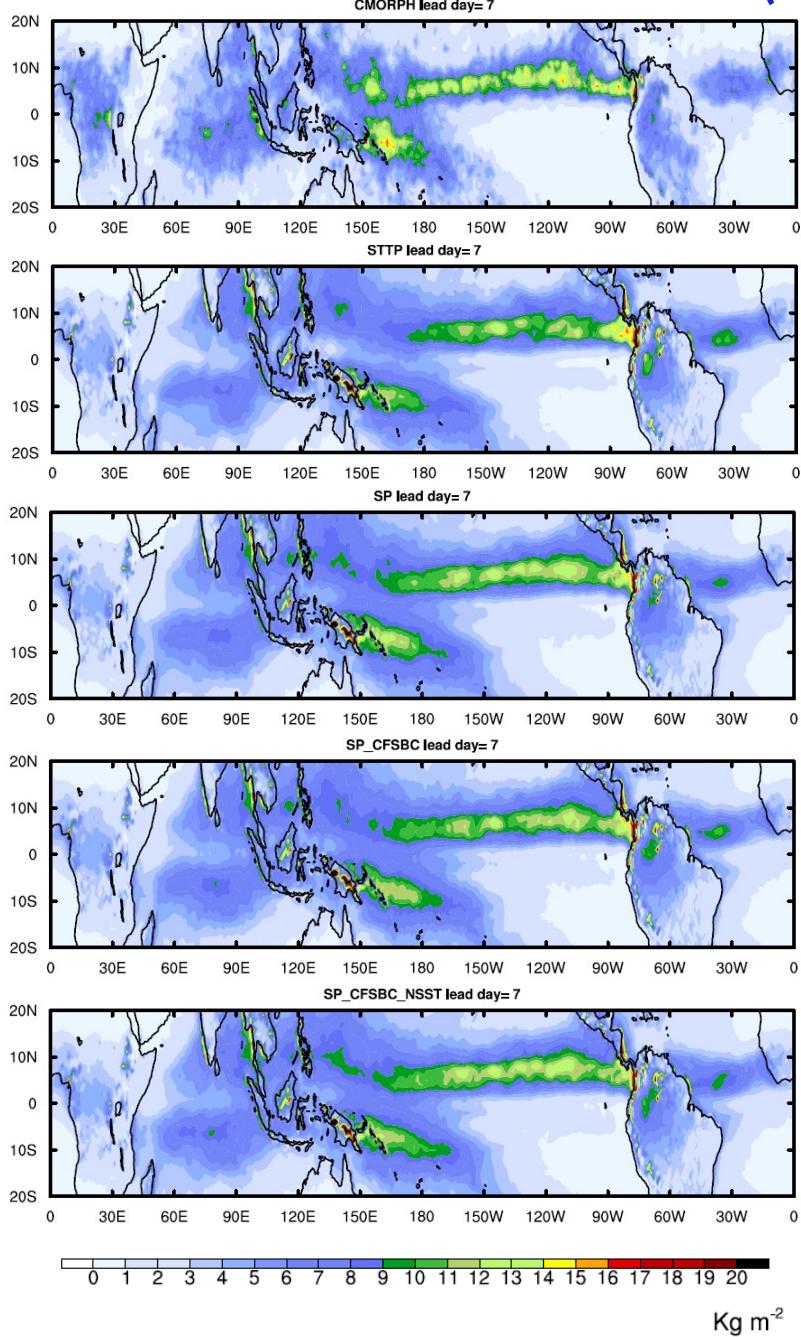
Difference Maps
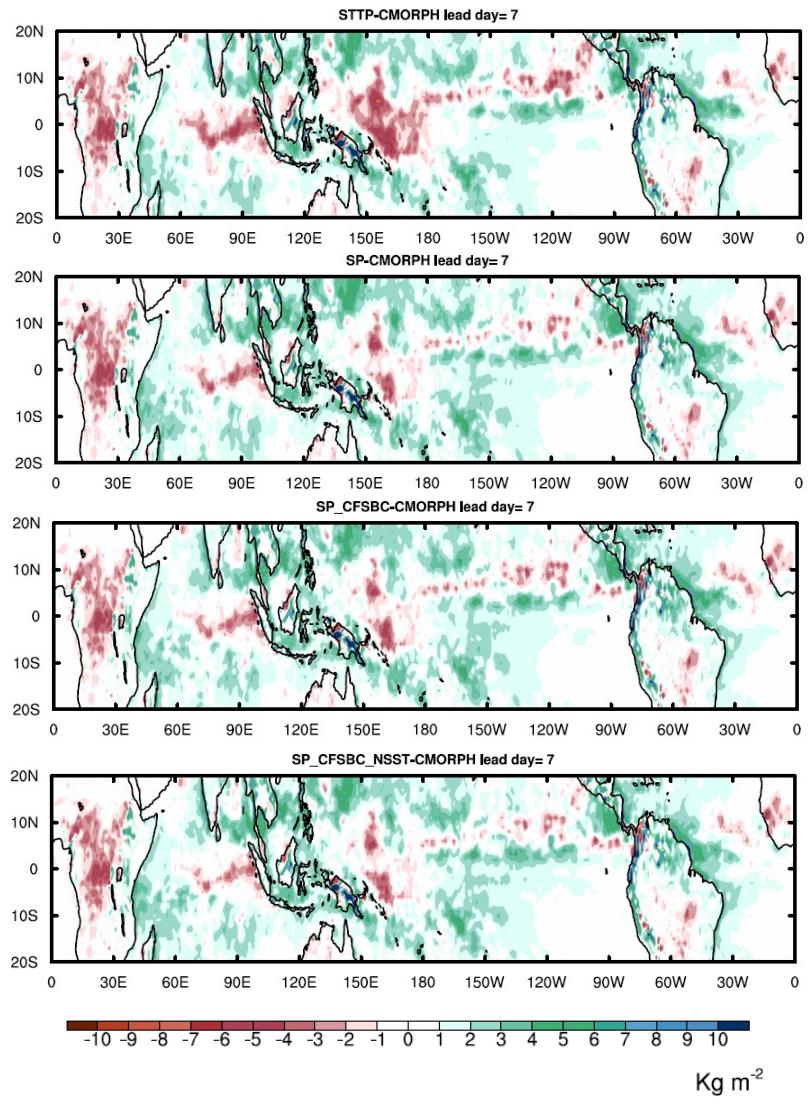
24 hr APCP (Lead day=14), 2yr ave.
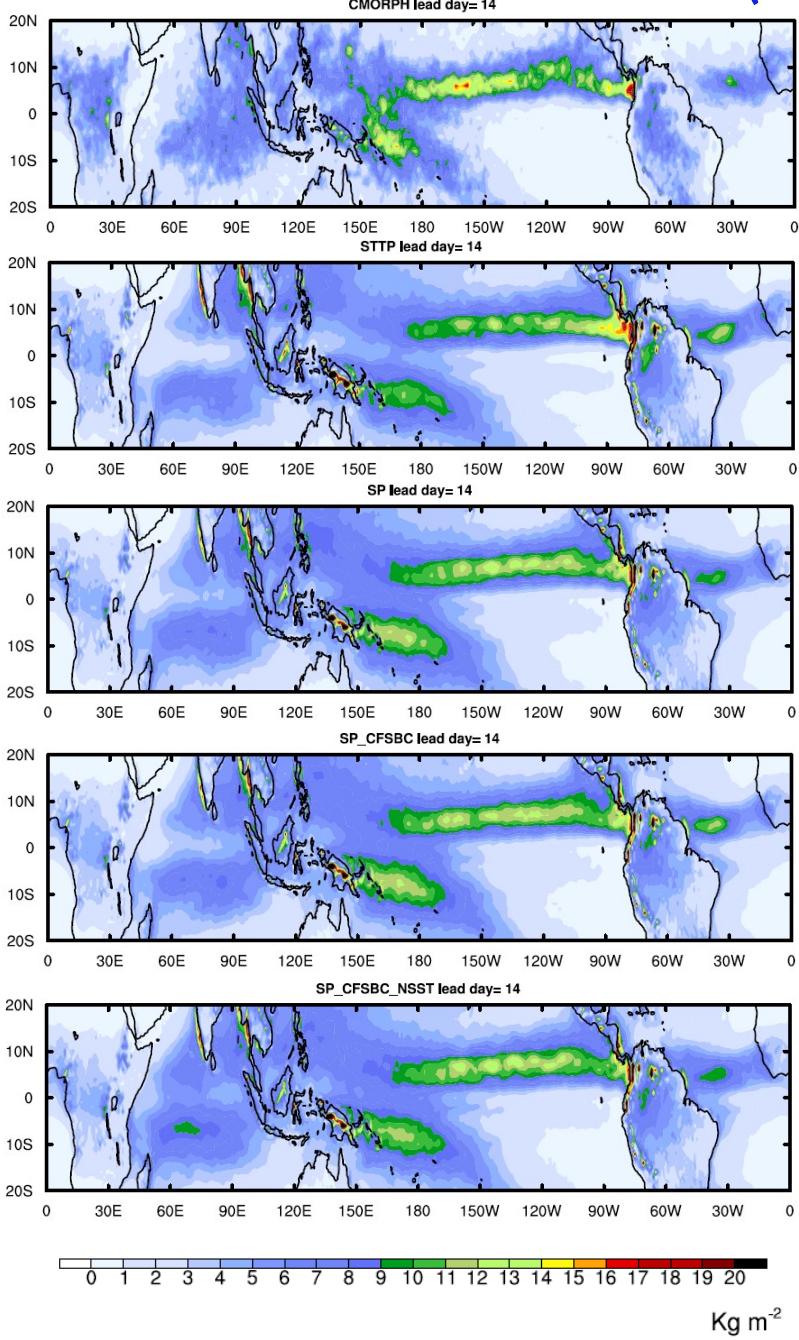
Difference Maps
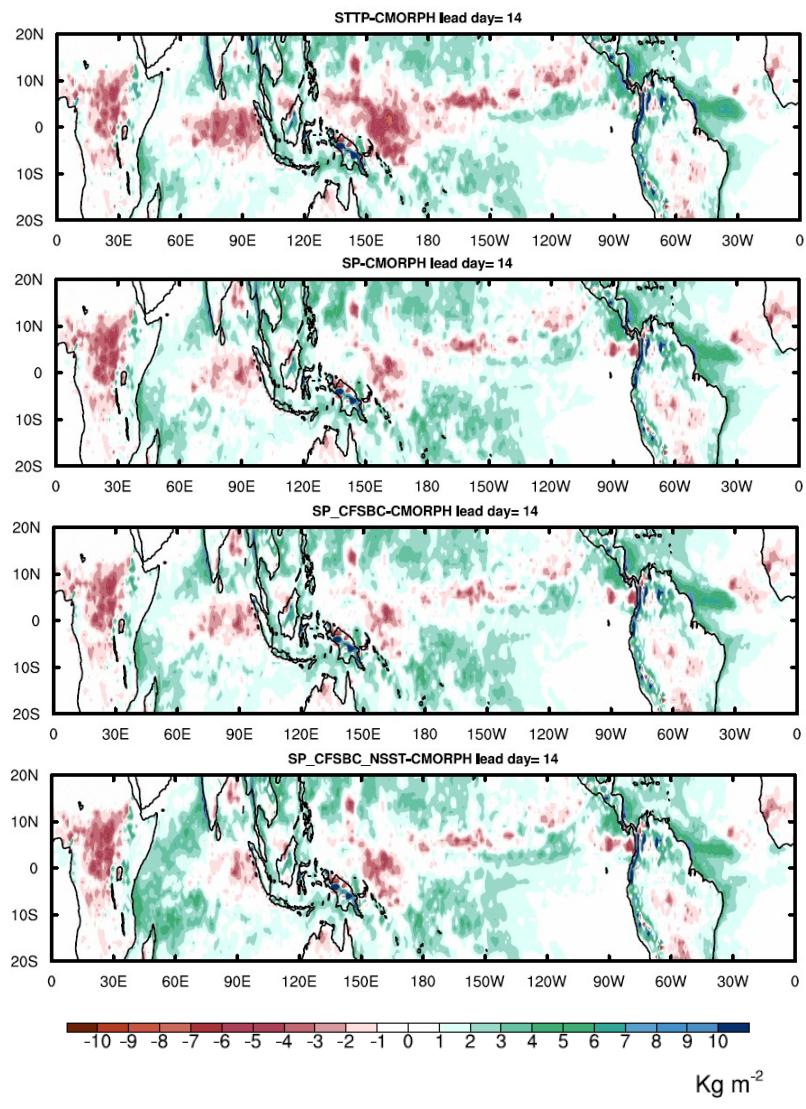
24 hr APCP (Lead day=21), 2yr ave.
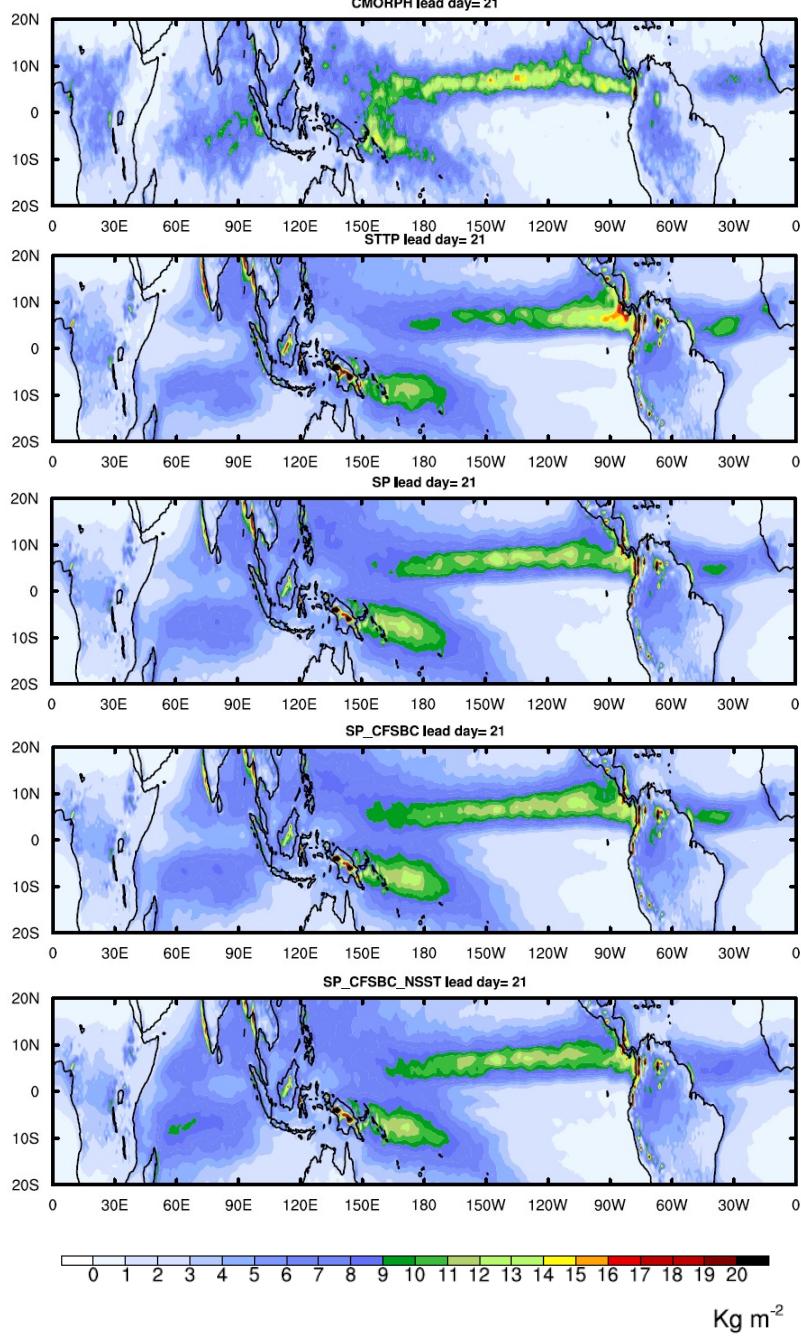
Difference Maps
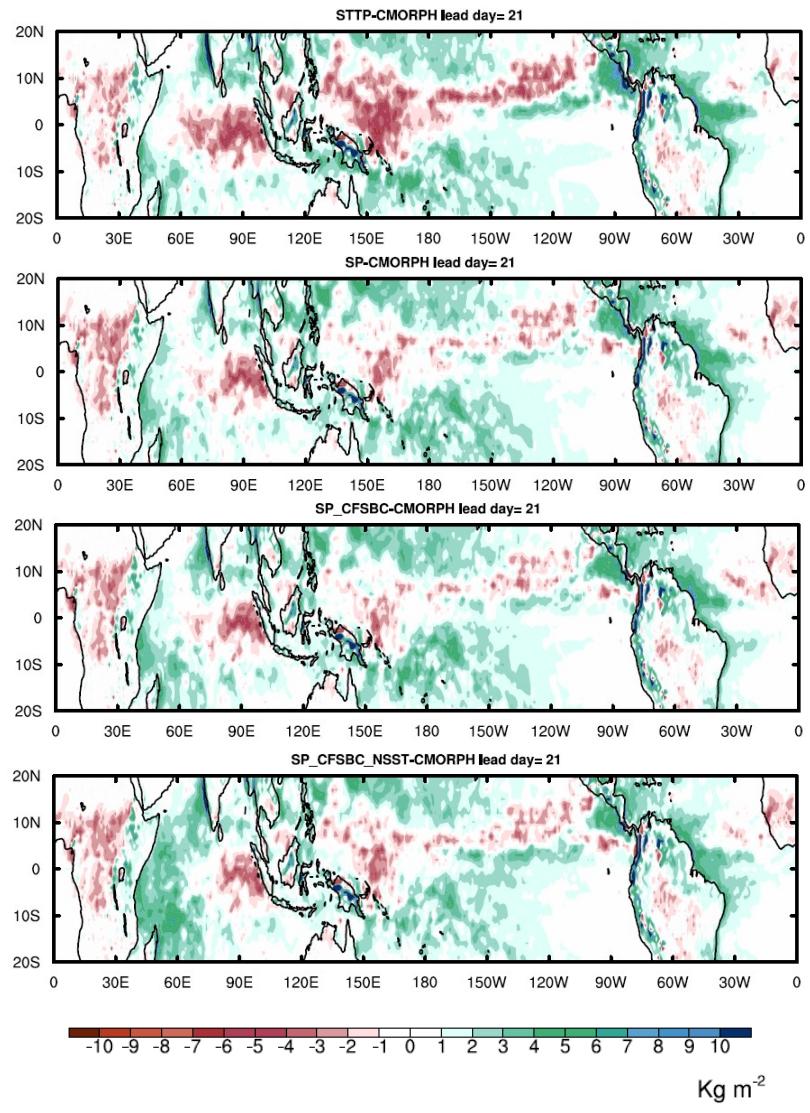
20140501-20160526
24hr accumulated precipitation

CMORPH lead day= 1

CMAP

Average Monthly Rate of Precipitation   mm/day

Average Monthly Rate of Precipitation 19790101-20161201 mm/day

Average Monthly Rate of Precipitation 20140501-20160501 mm/day
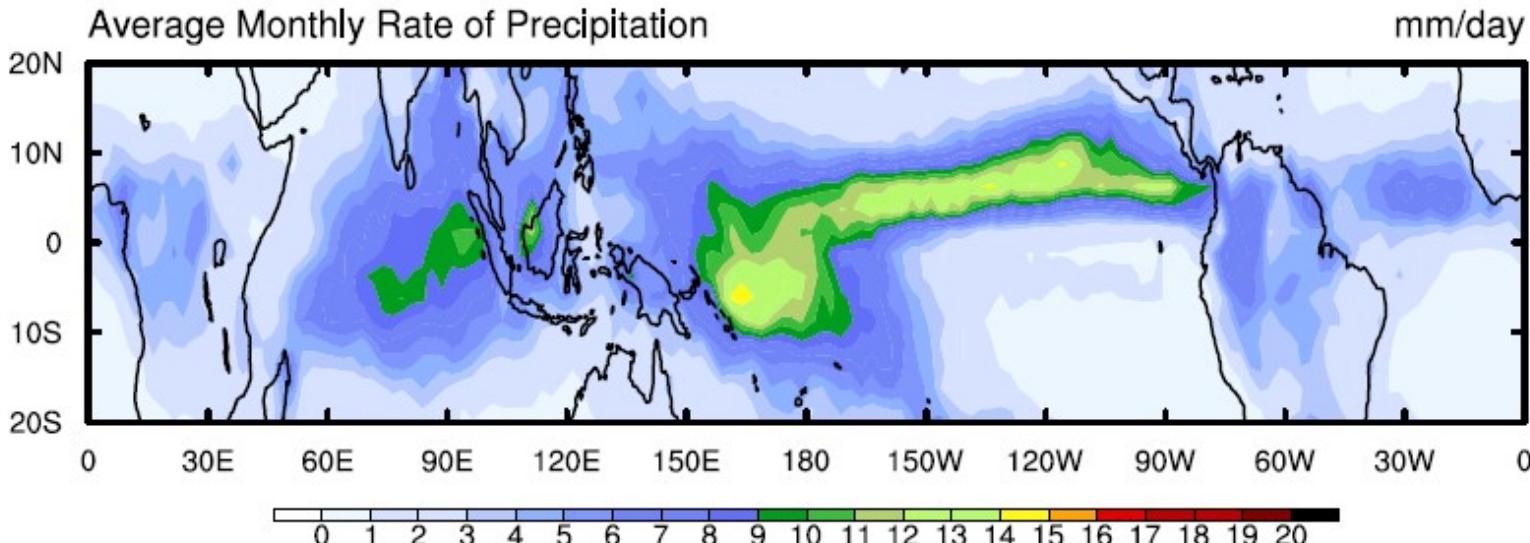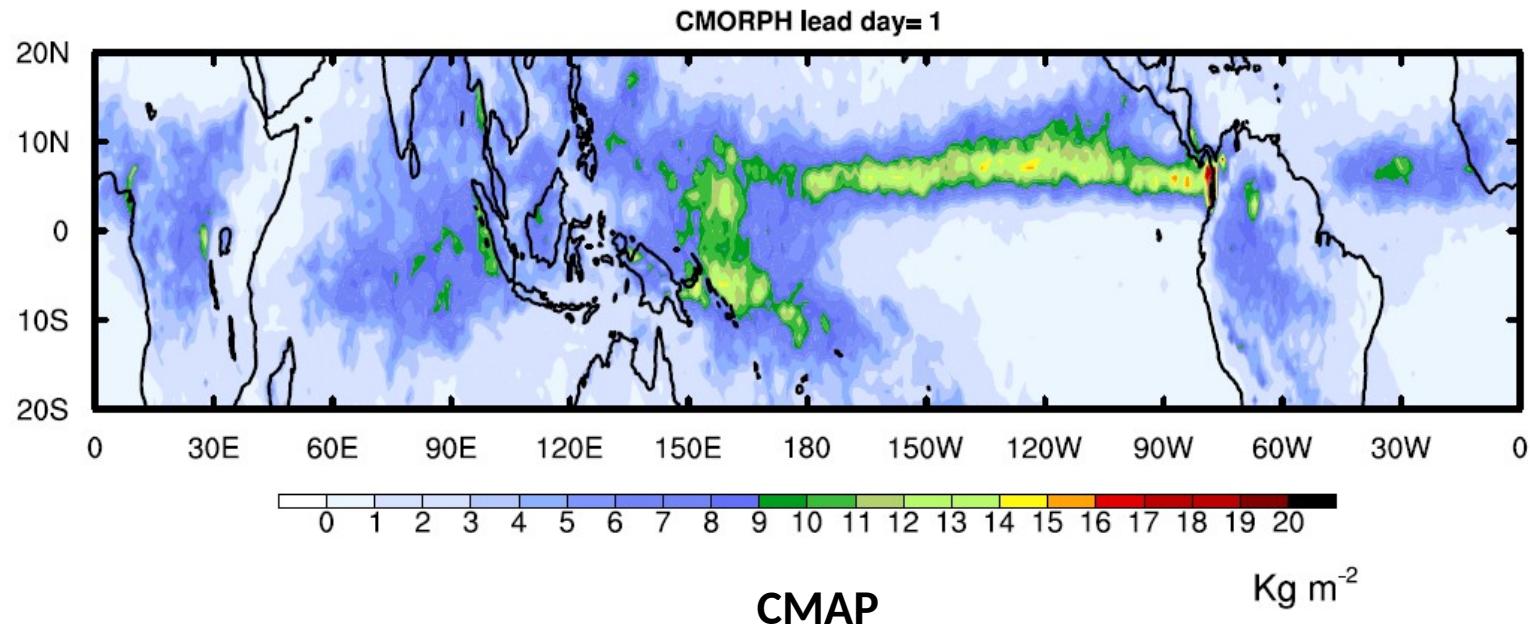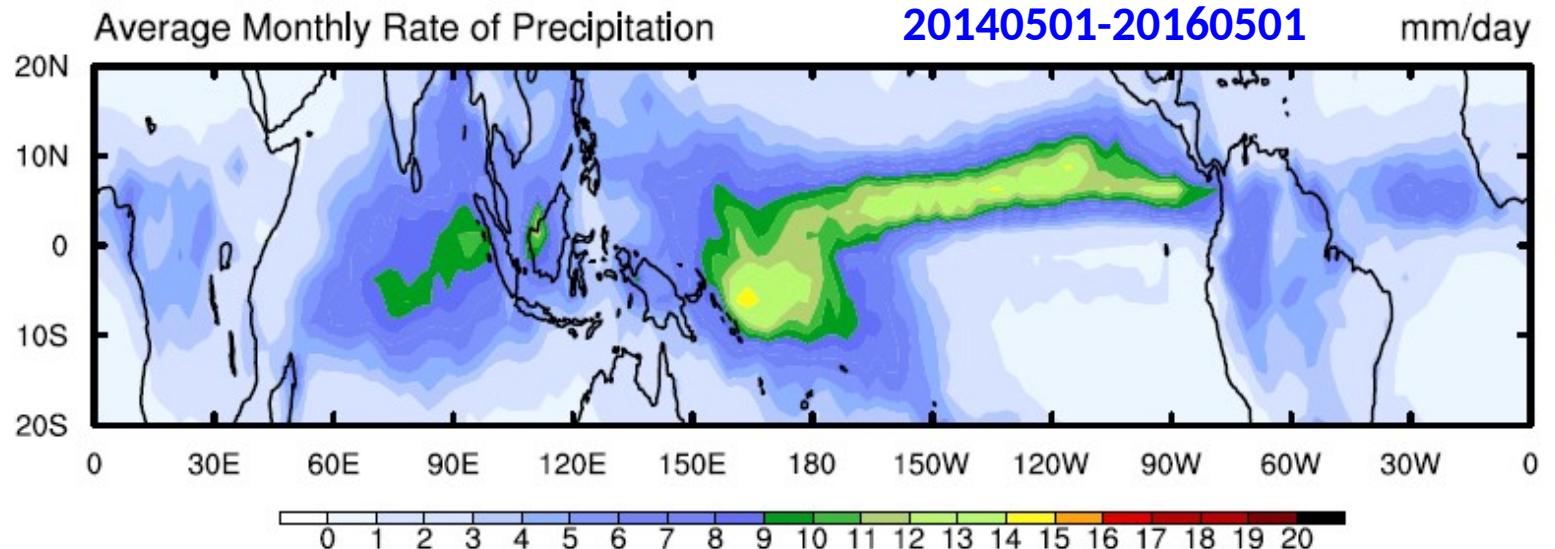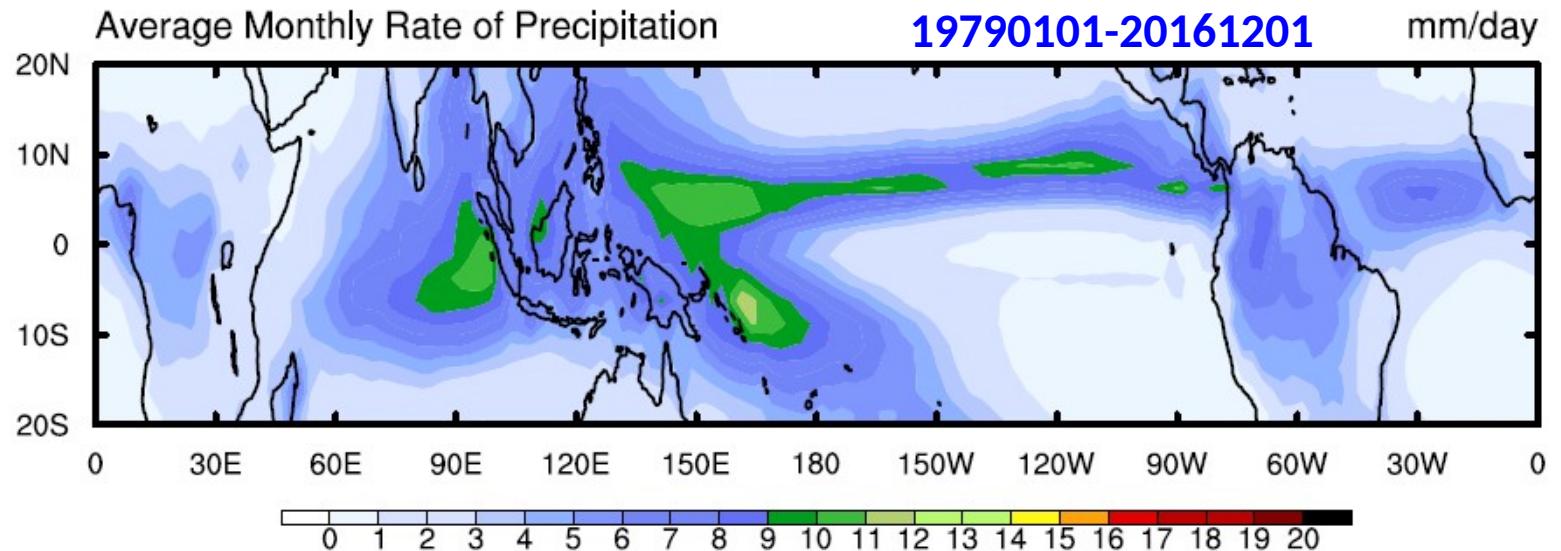
(15S-15N) Latitude Band Ave

lead day= 1

cor(cmorph,STTP)= 0.56
cor(cmorph,SP)= 0.56
cor(cmorph,SP_CFSBC)= 0.54
cor(cmorph,SP_CFSBC_NSST)= 0.56

lead day= 7

cor(cmorph,STTP)= 0.44
cor(cmorph,SP)= 0.48
cor(cmorph,SP_CFSBC)= 0.49
cor(cmorph,SP_CFSBC_NSST)= 0.49

lead day= 14

cor(cmorph,STTP)= 0.32
cor(cmorph,SP)= 0.40
cor(cmorph,SP_CFSBC)= 0.41
cor(cmorph,SP_CFSBC_NSST)= 0.40

lead day= 21

cor(cmorph,STTP)= 0.12
cor(cmorph,SP)= 0.19
cor(cmorph,SP_CFSBC)= 0.29
cor(cmorph,SP_CFSBC_NSST)= 0.22

CMORPH
STTP
SP
SP_CFSBC
SP_CFSBC_NSST
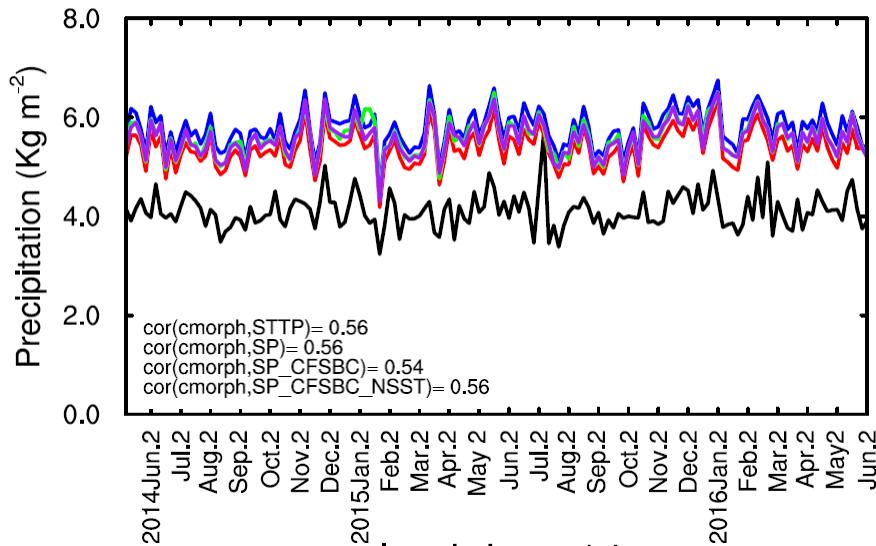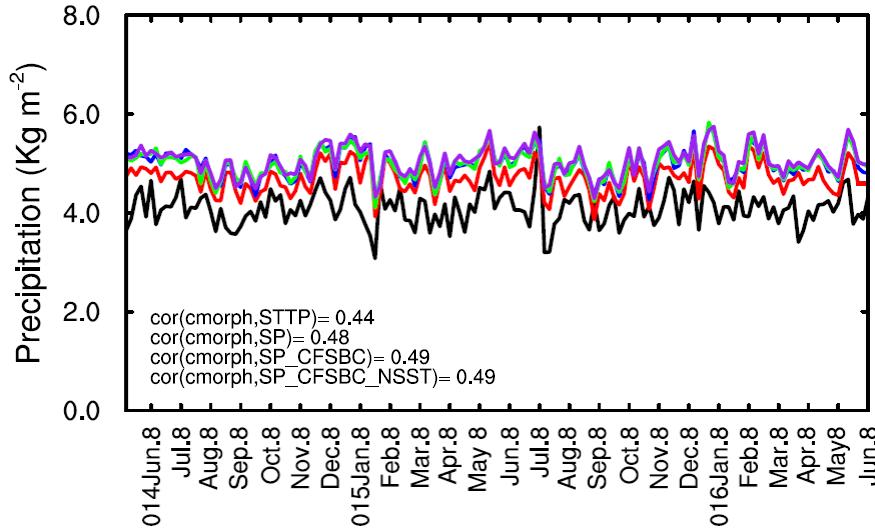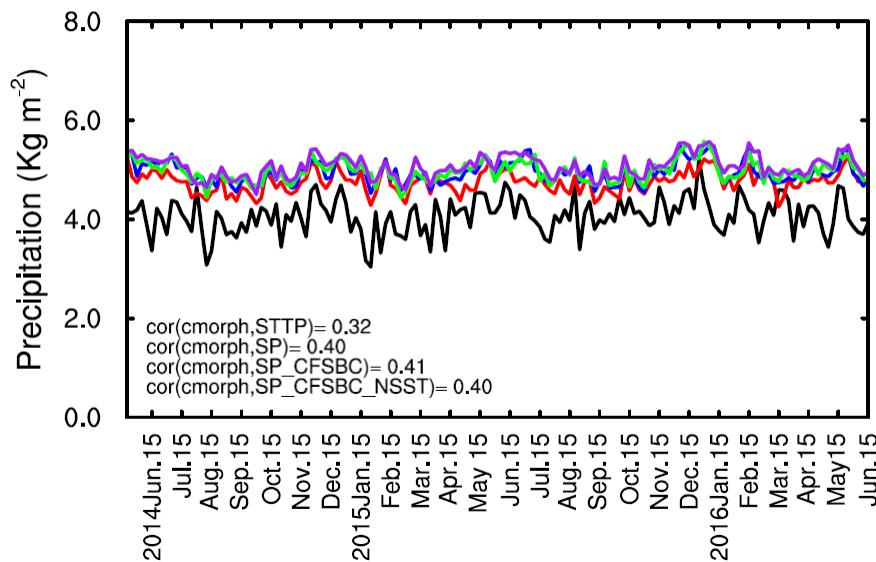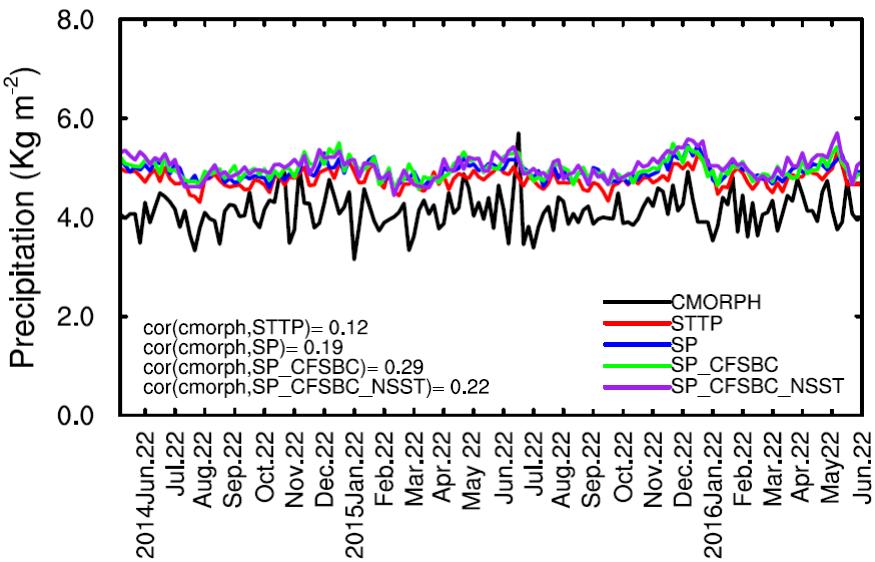
WH-MJO Forecast Skills After Smoothing

SPs case

MJO skill: RMM1+RMM2
20140501-20160526

Amplitude of MJO (square root of RMM1² + RMM2²)