



Diagnostic Study of CWB Seasonal Climate Forecast System

Climate Forecast System
Development Team

Research and Development Center

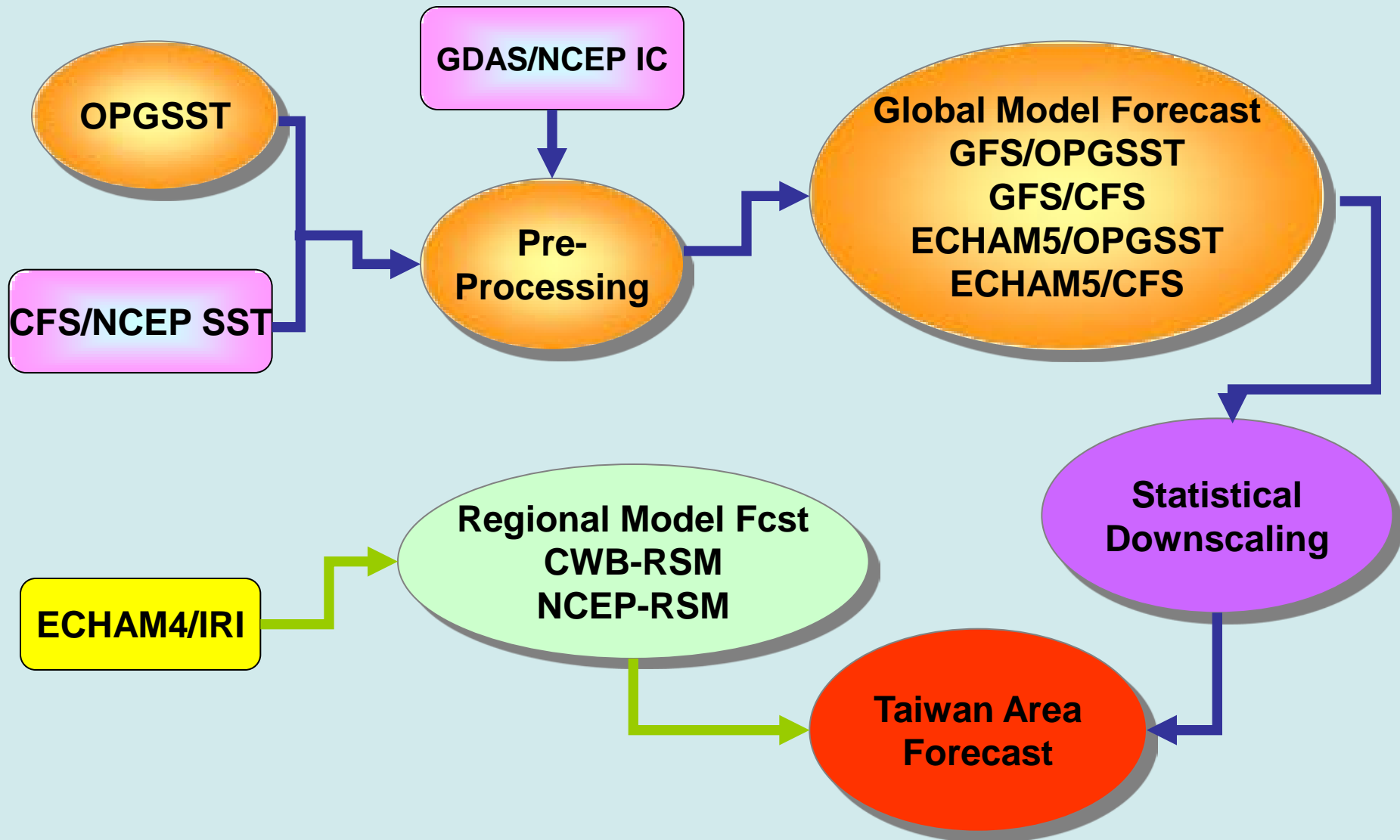
Central Weather Bureau

Presented by

Jyh-Wen Hwu

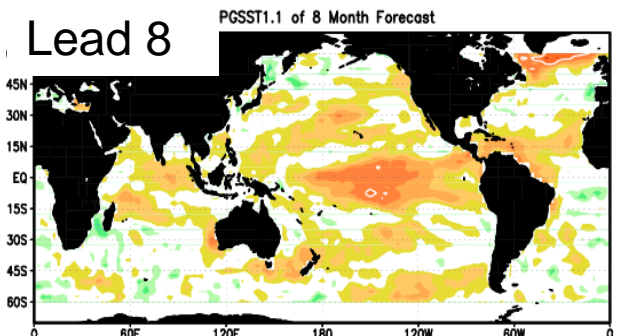
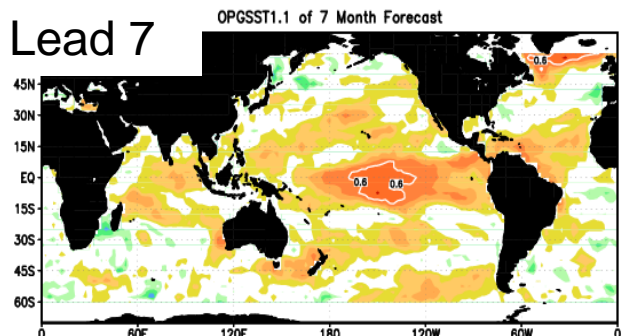
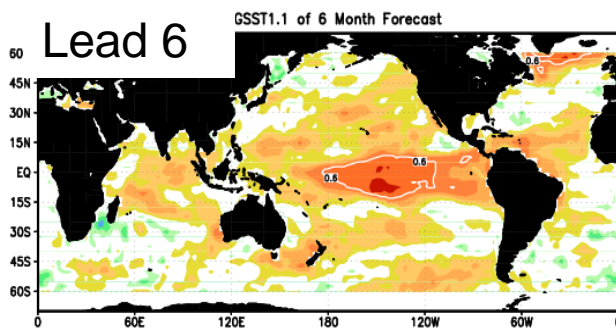
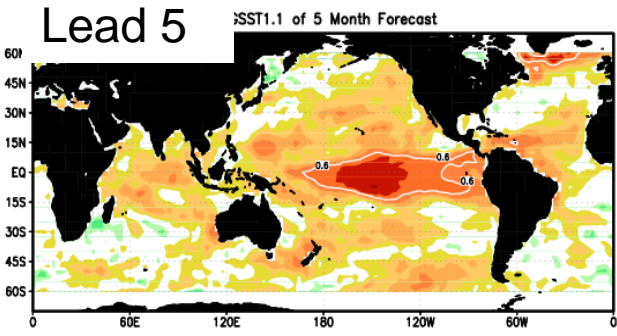
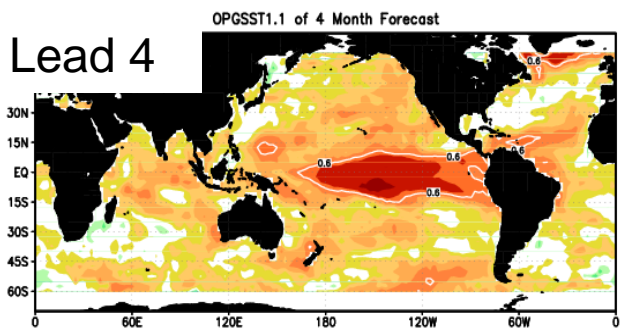
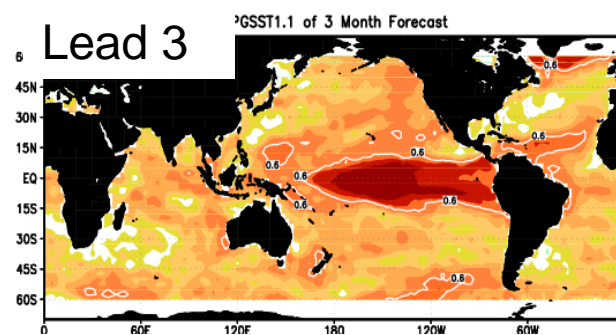
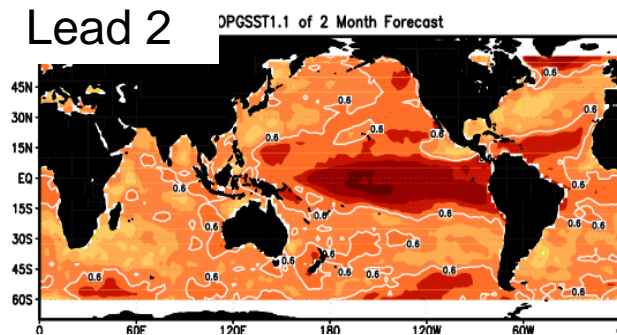
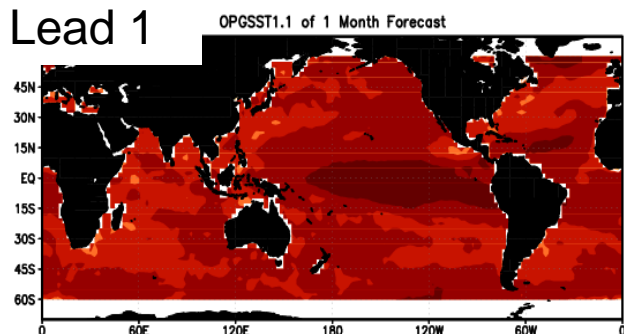


Seasonal Forecast System

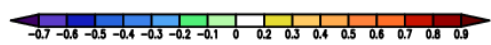




Temporal Anomaly Correlation of OPGSST (198101-200809)



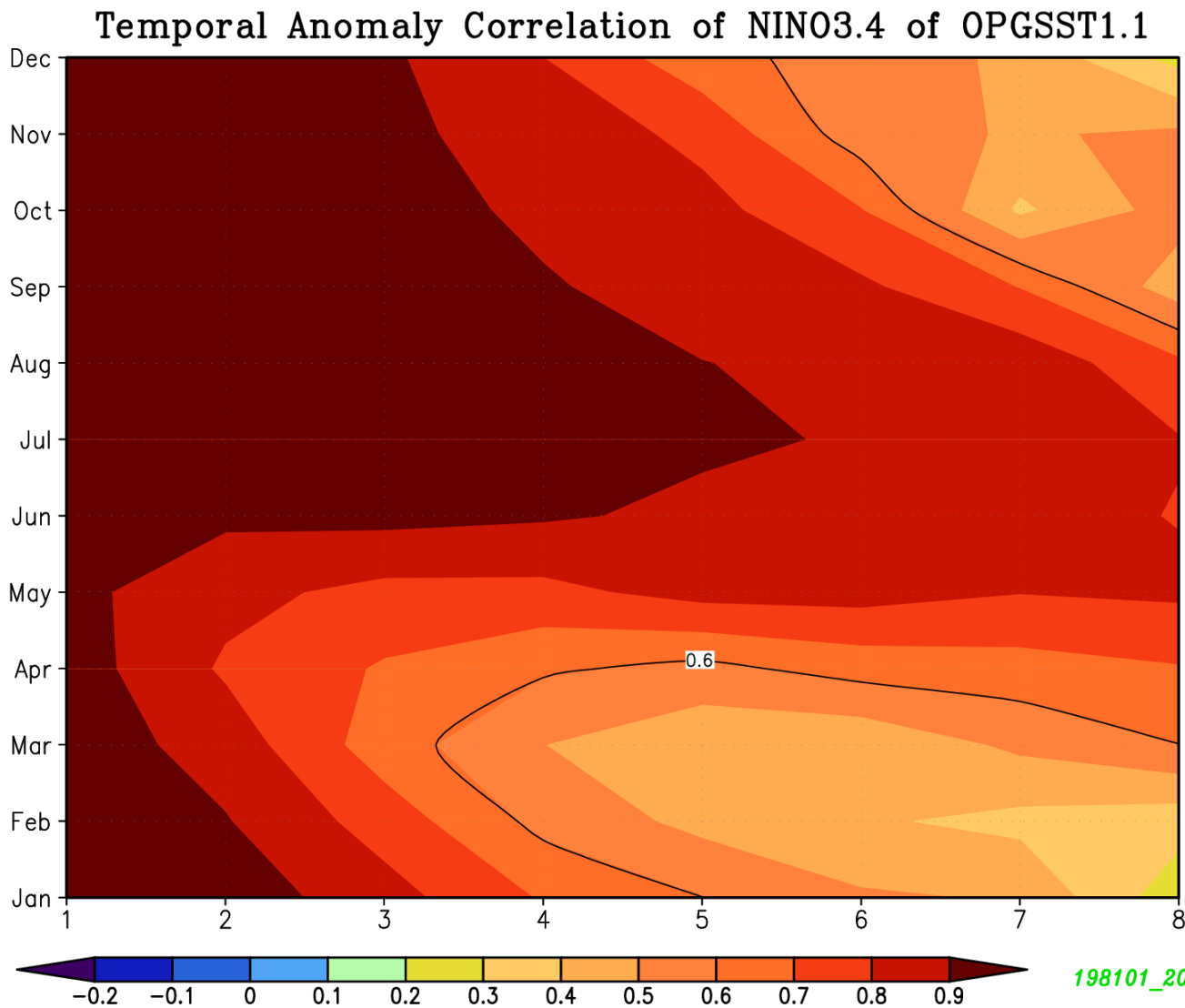
cpa_198101_200809



cpa_198101_200809



Hindcast Mode (1981-2005)





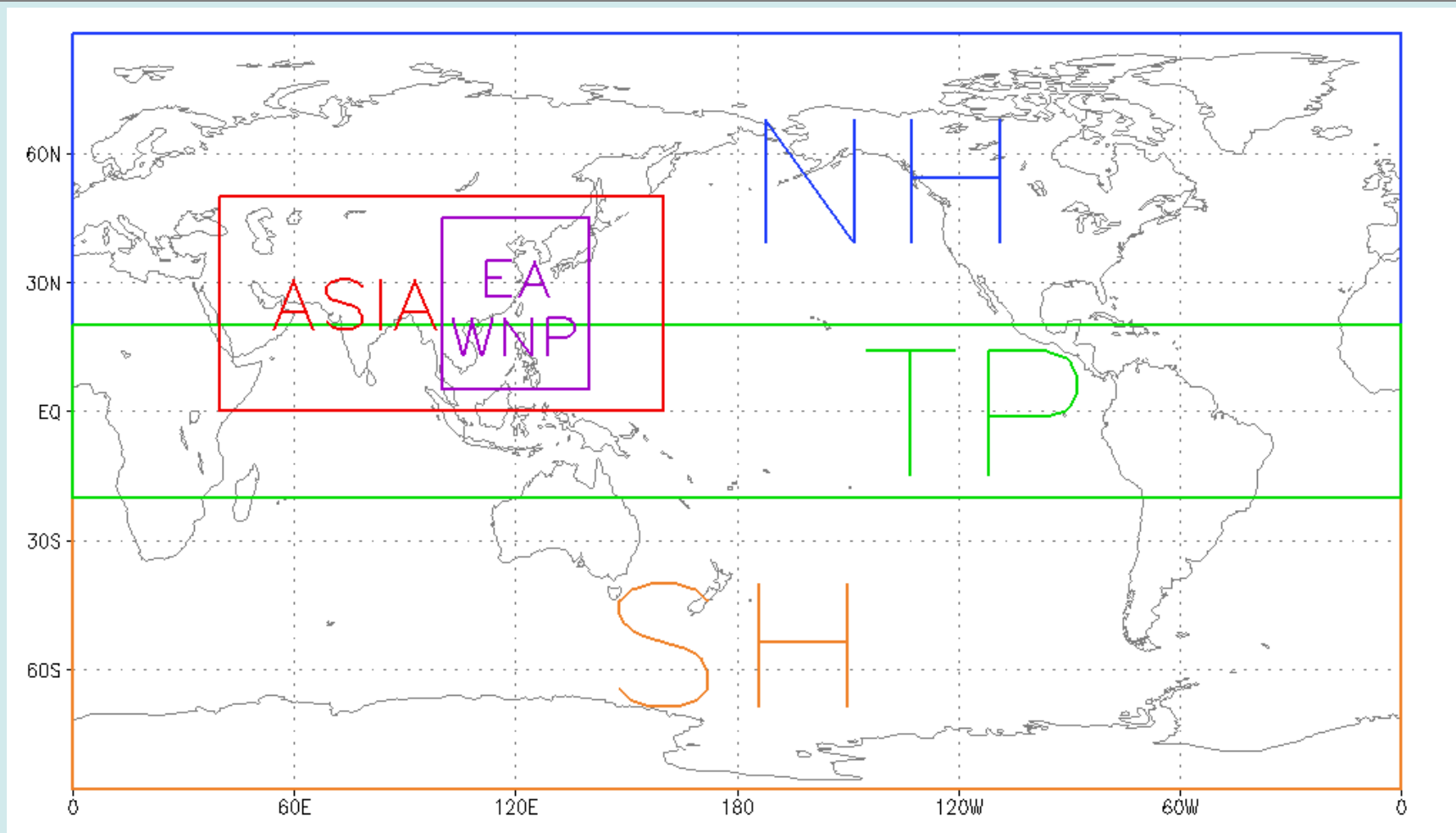
Two-tier Global Forecast System

- Two SST forecasts: OPGSST/CWB, CFS/NCEP
- Two AGCMs: GFS/CWB, ECHAM5/MPI
- Four modules: GFS/OPGSST, GFS/CFS, ECHAM5/OPGSST, ECHAM5/CFS
- 10 7-month forecast members for each module
- 40 members ensemble forecast.
- Hindcast length: 1981-2005



Hindcast Skills

- Anomaly Correlation (AC)
- Equitable Thread Score (ETS)
- Gerrity Skill Score (GSS)
- Heidke Skill Score (HSS)
- Relative Operating Characteristic (ROC)
- Reliability Diagram
- Brier Score
- ...



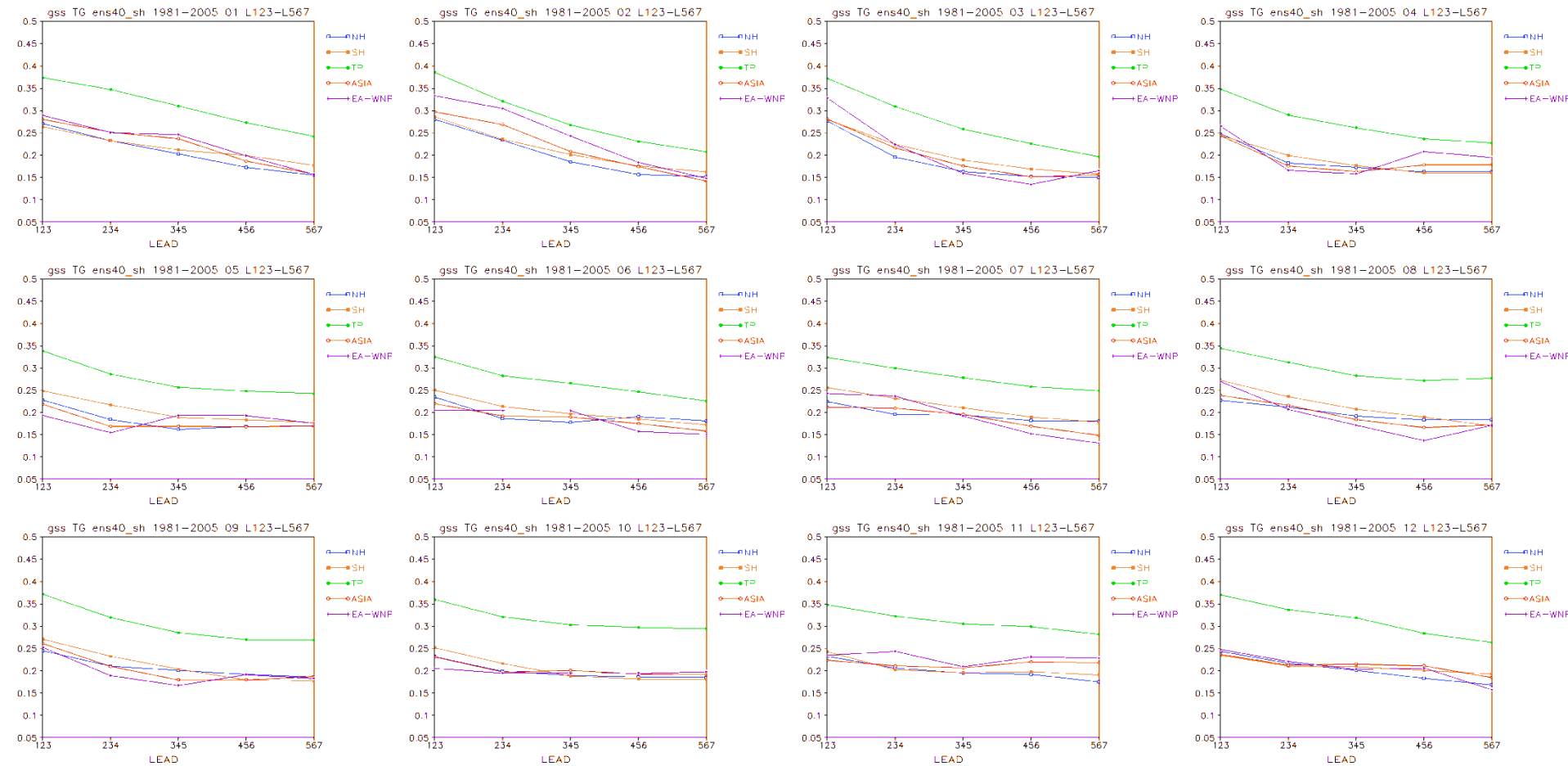
TP (20°S-20°N, 0°-360°E); SH (90°S-20°S, 0°-360°E)

NH (20°N-90°N, 0°-360°E)

ASIA (0°-50°N, 40°E-160°E) ;EA-WNP (5°N-45°N, 100°E-140°E)

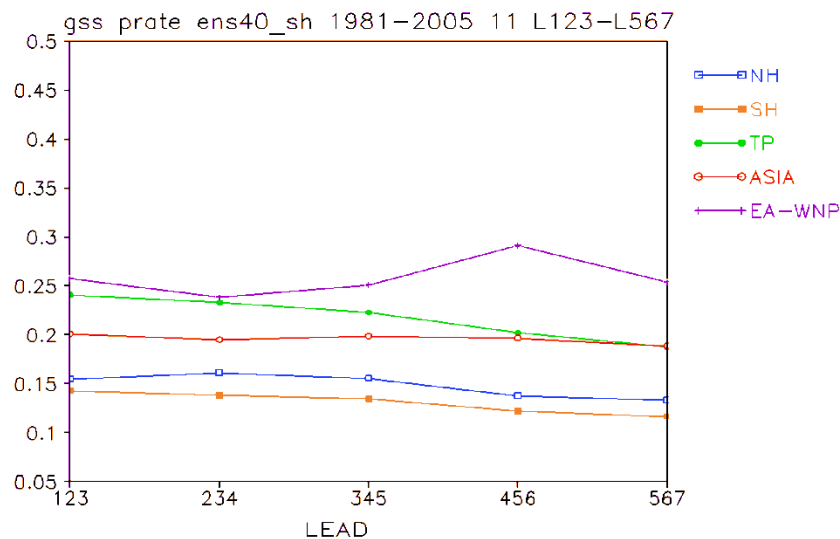
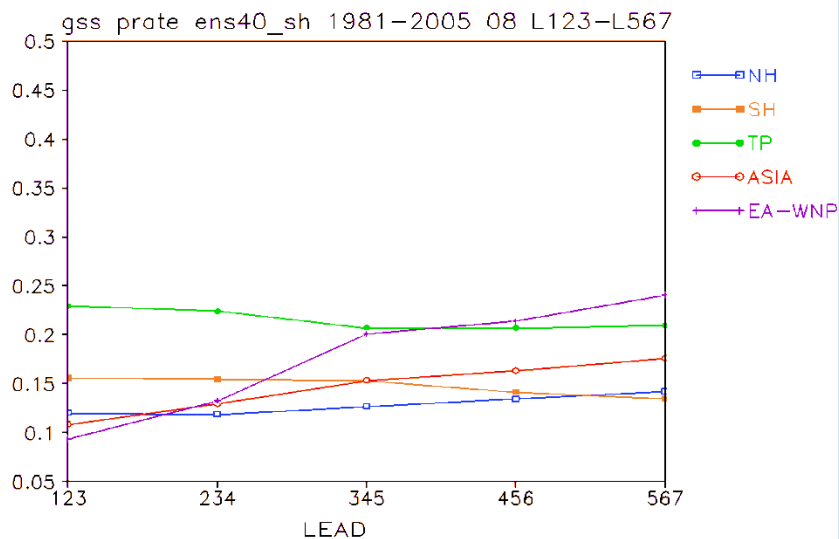
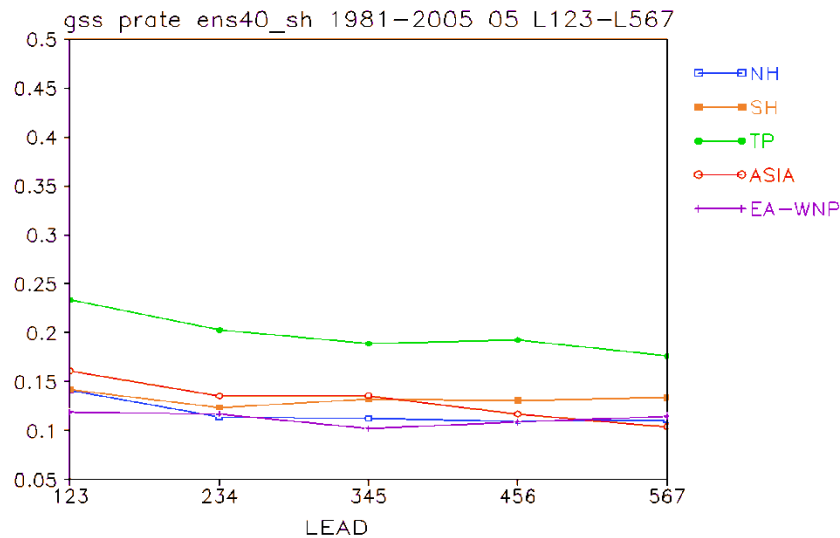
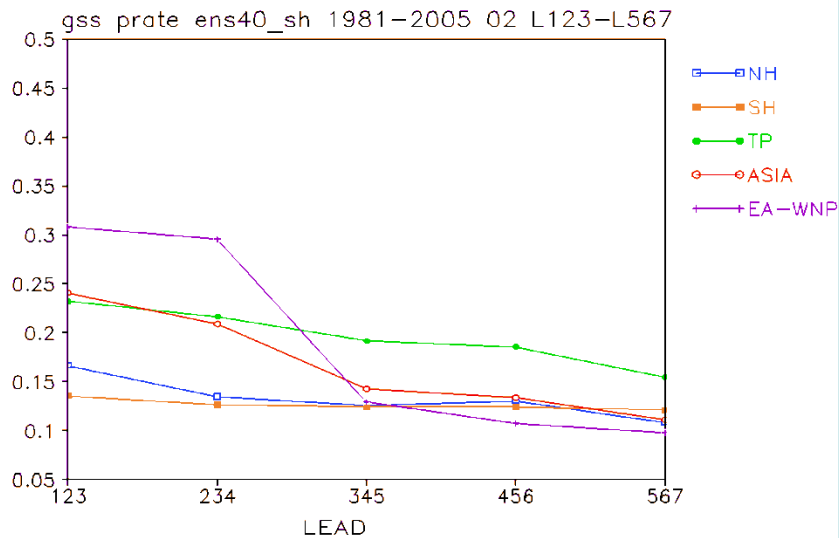


Ground Temperature GSS 12-months (L123-L567)



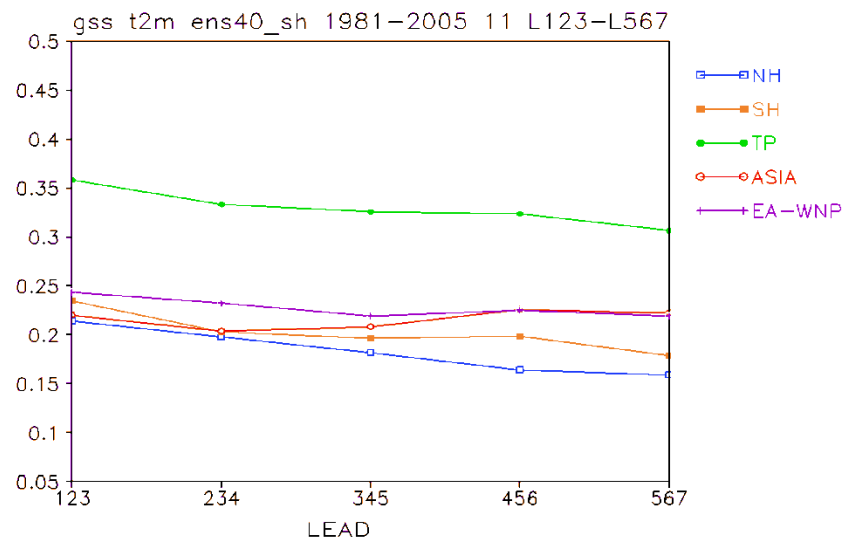
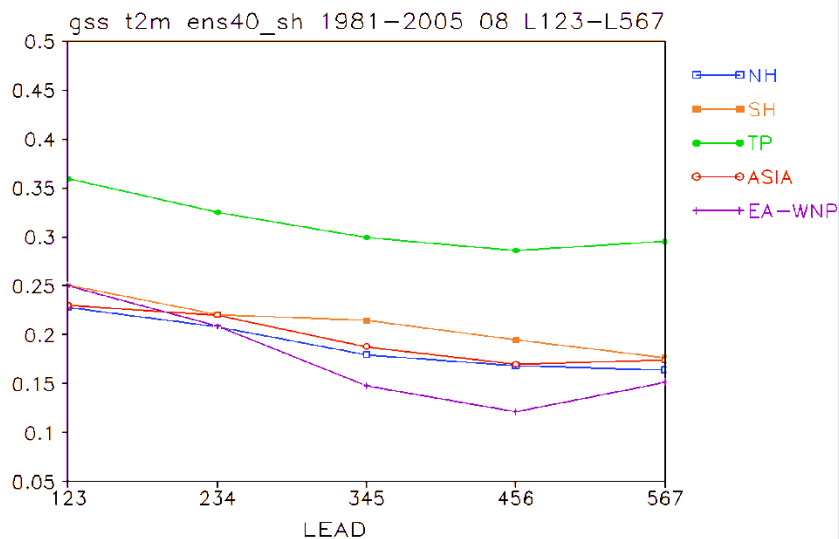
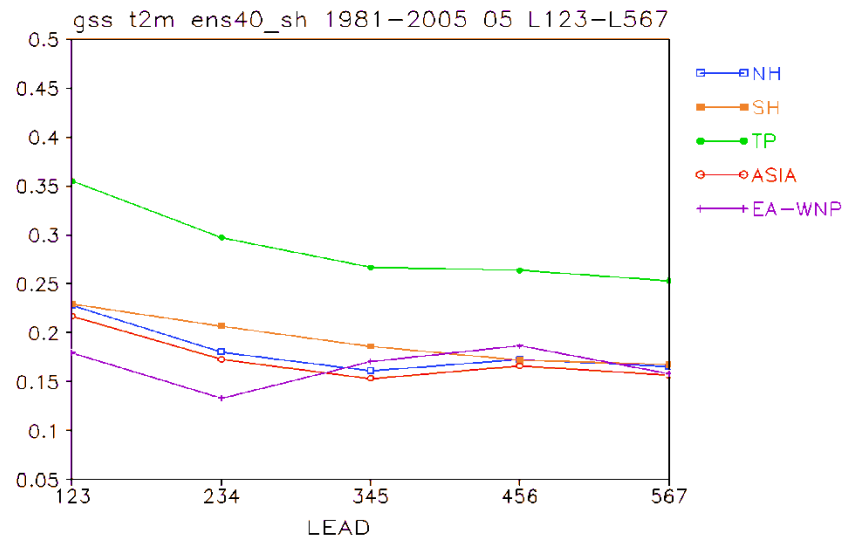
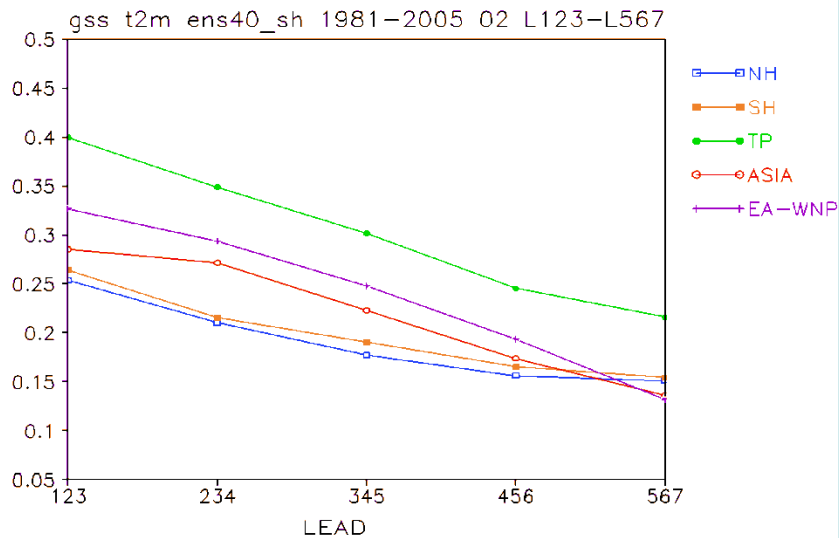


Precipitation GSS (2, 5, 8, 11)



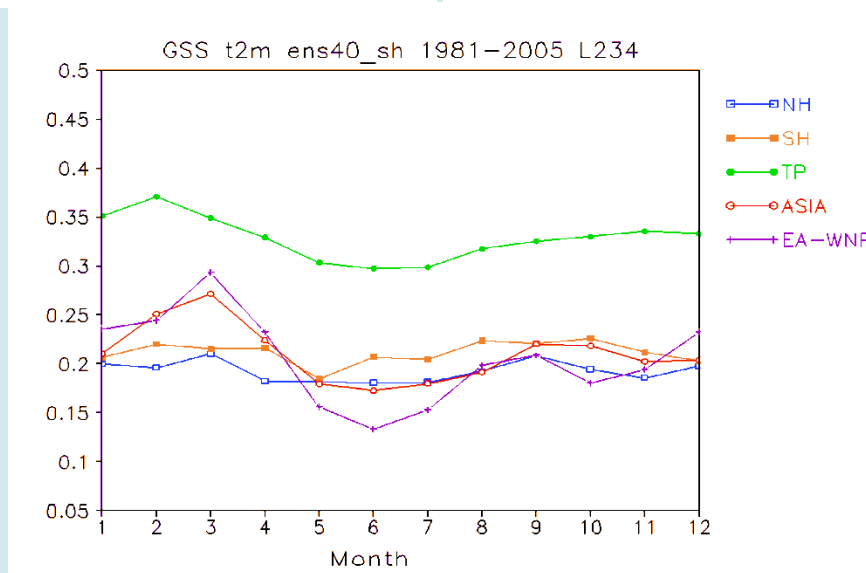
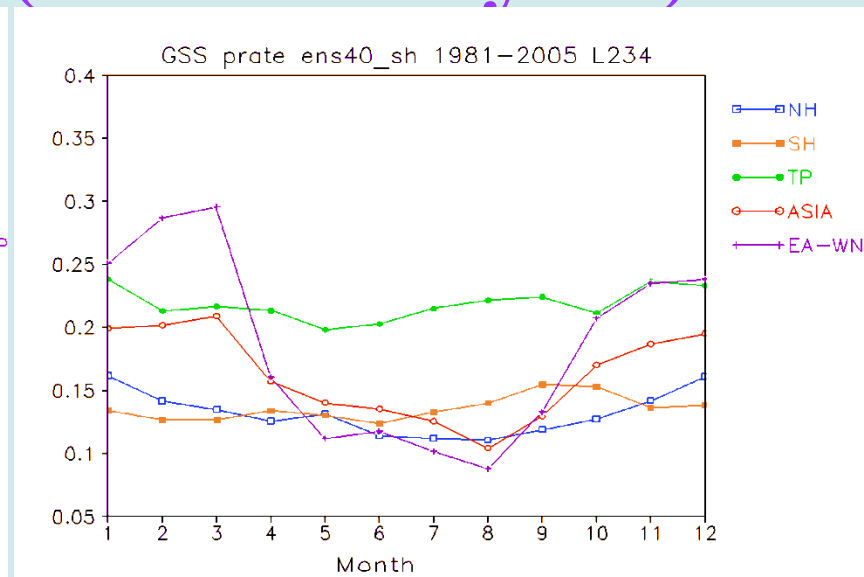
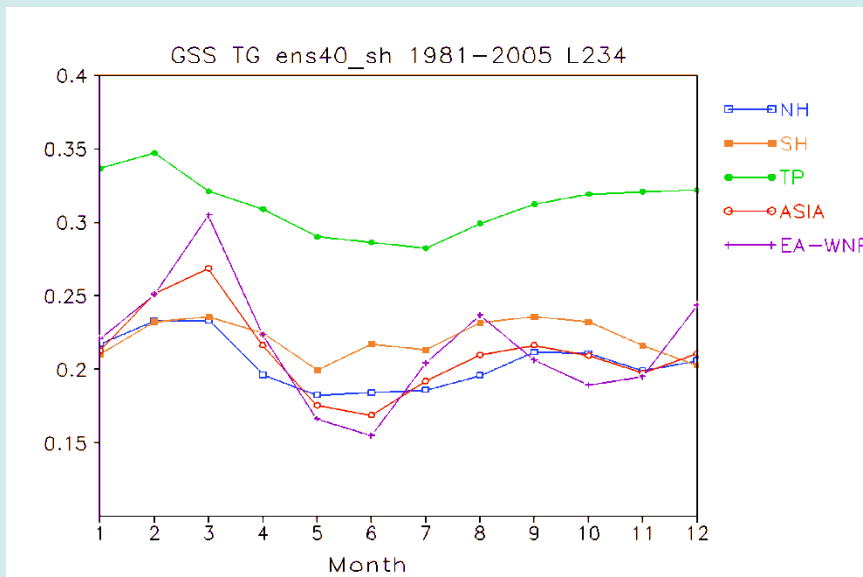


2-meter Temperature GSS (2, 5, 8, 11)



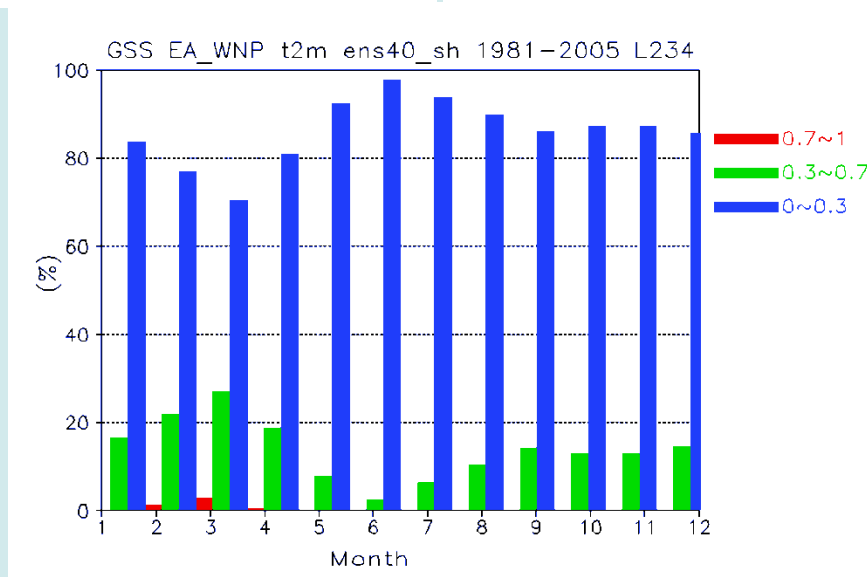
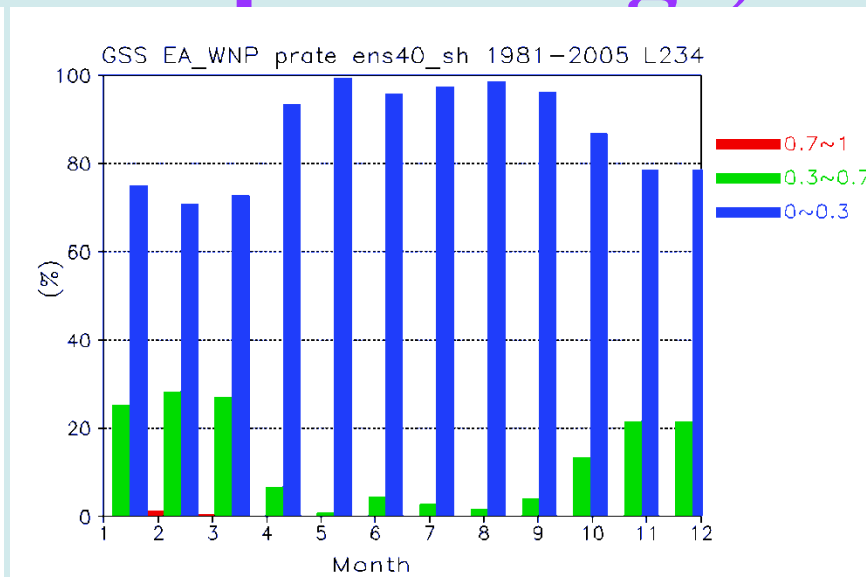
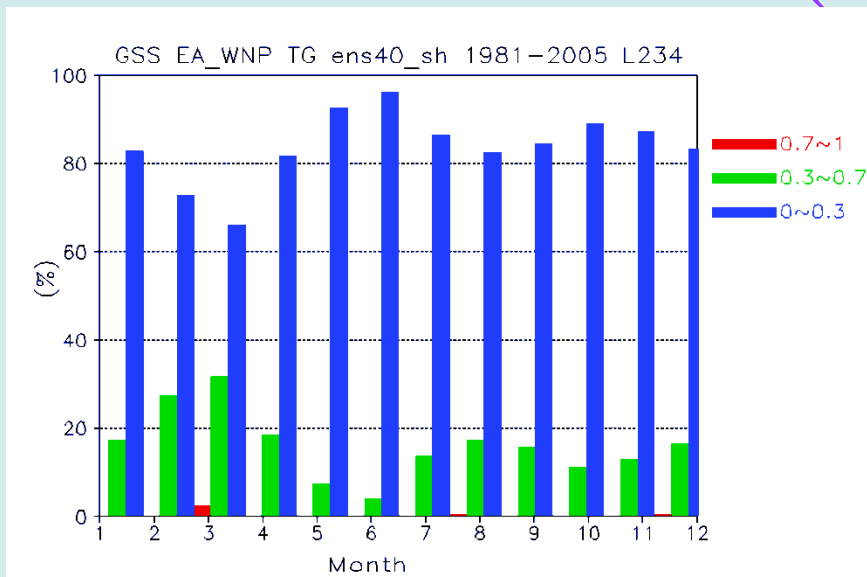


Lead 234 GSS (Annual Cycle)



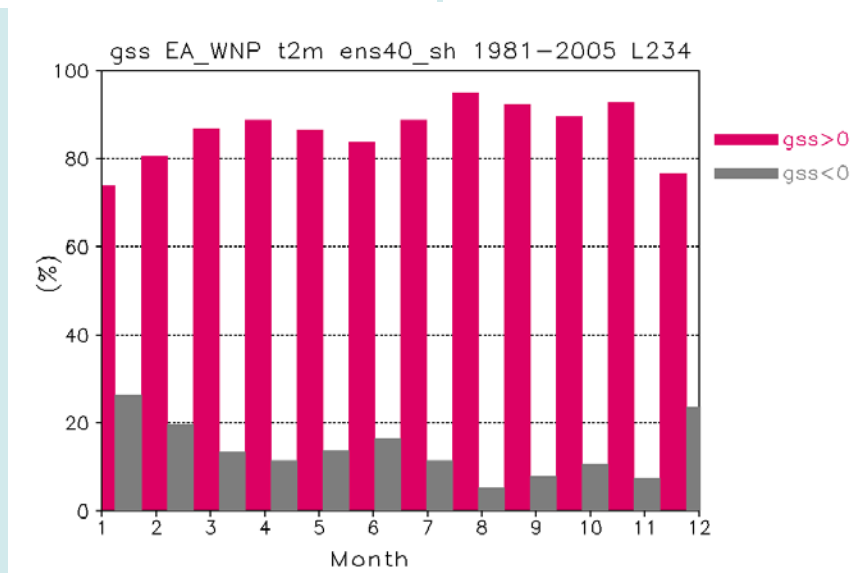
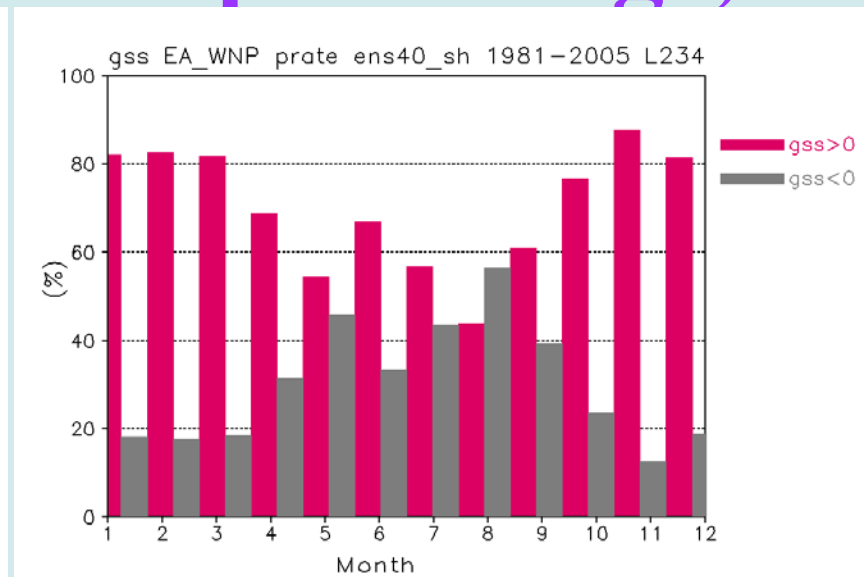
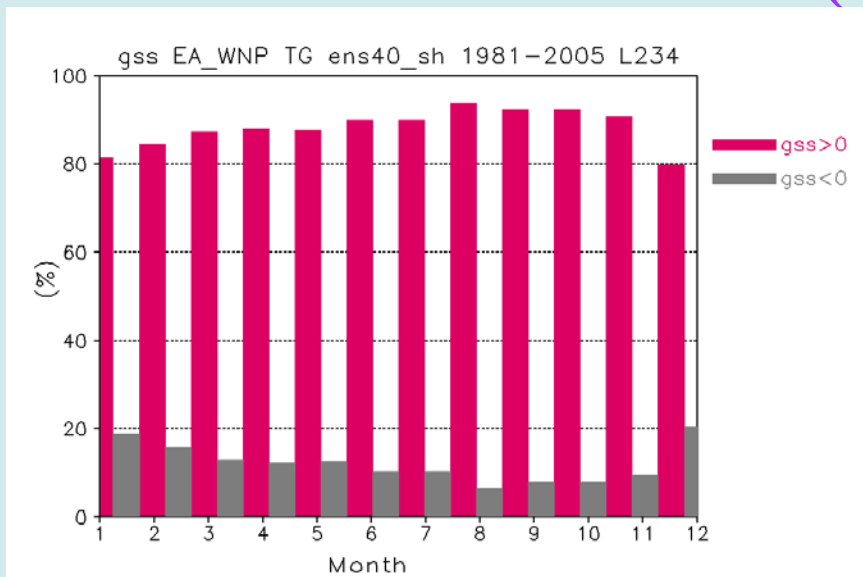


Lead 234 GSS (score percentage)



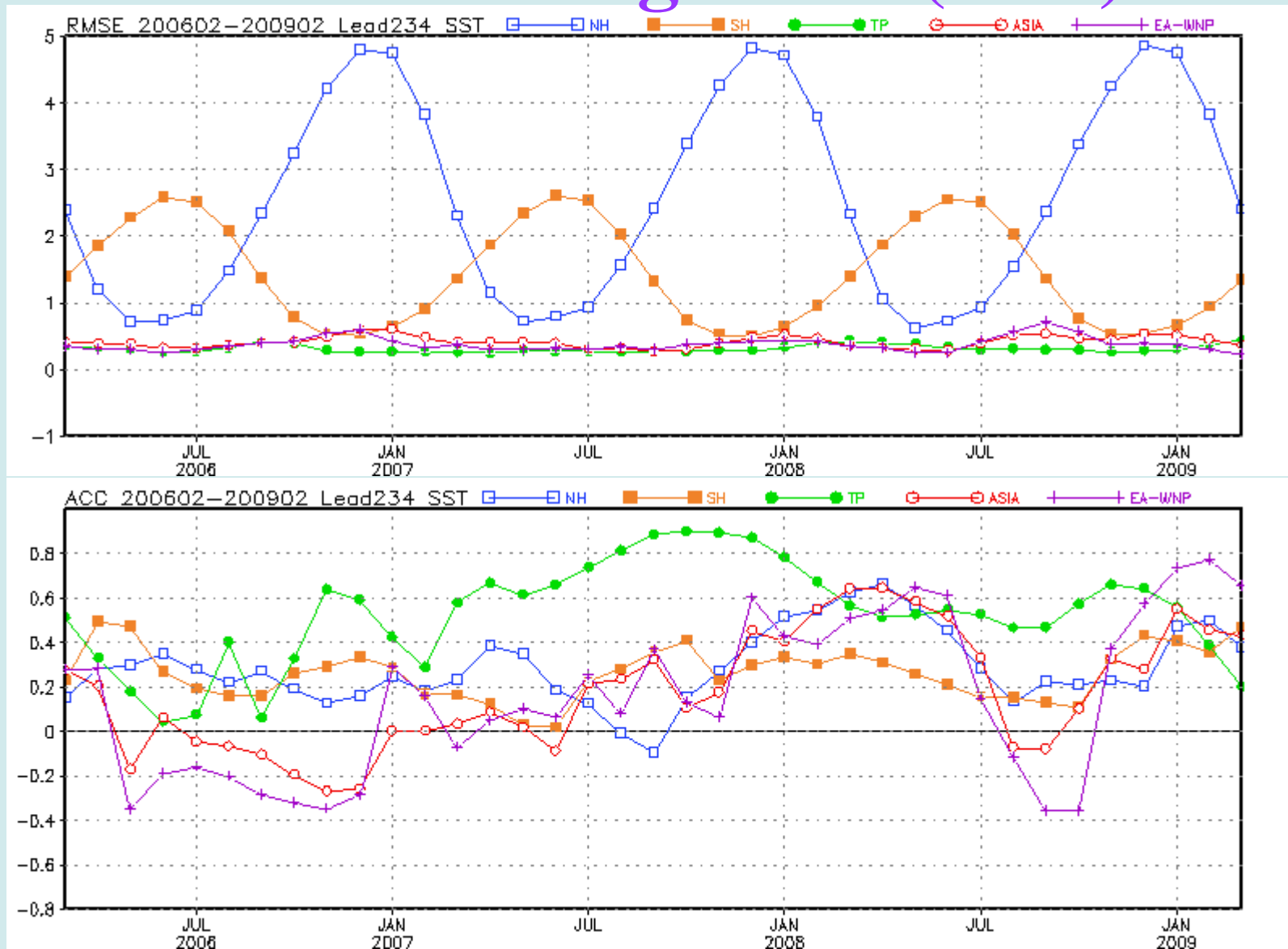


Lead 234 GSS (area percentage)



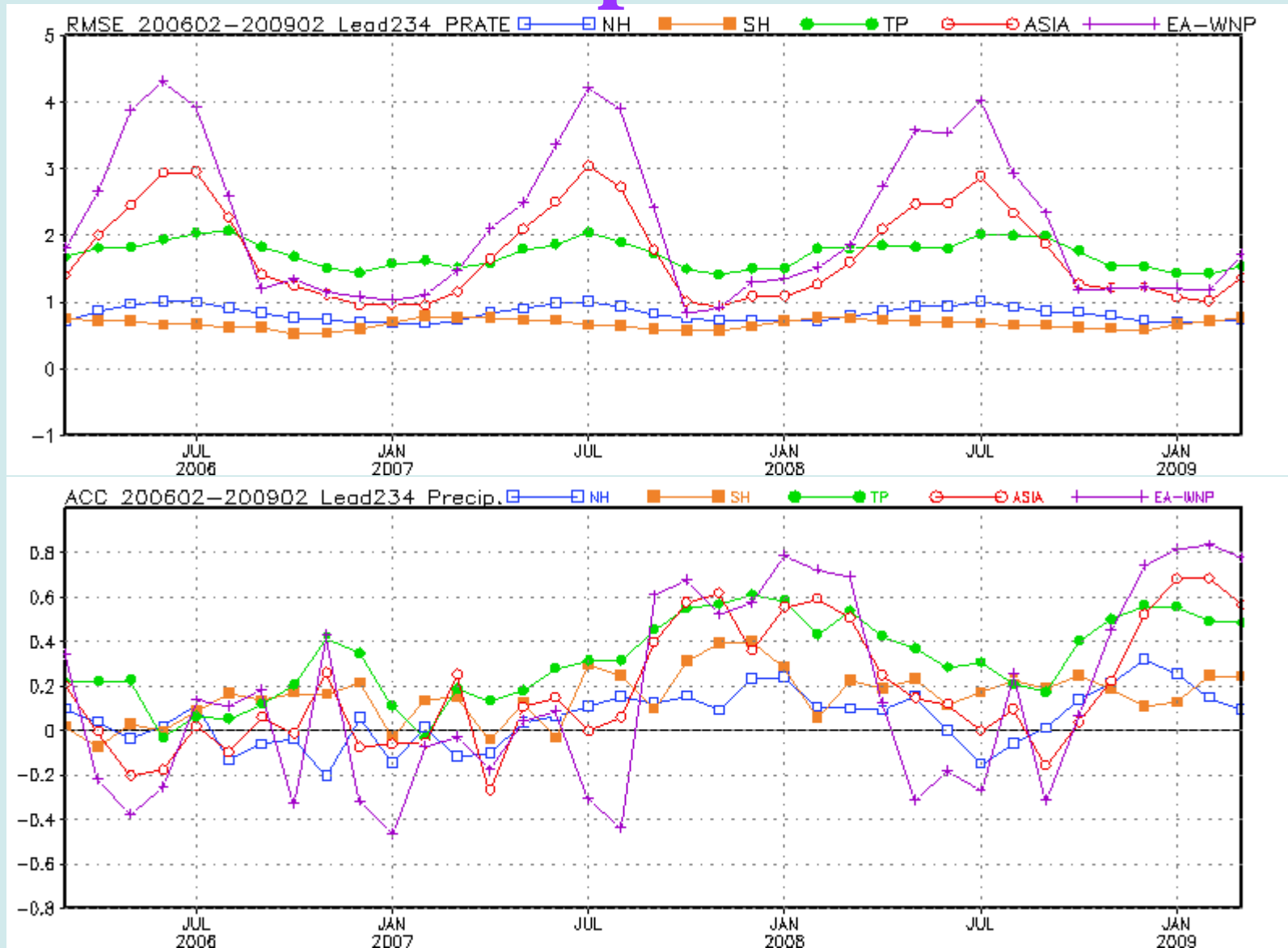


Forecast Diagnostic (SST)



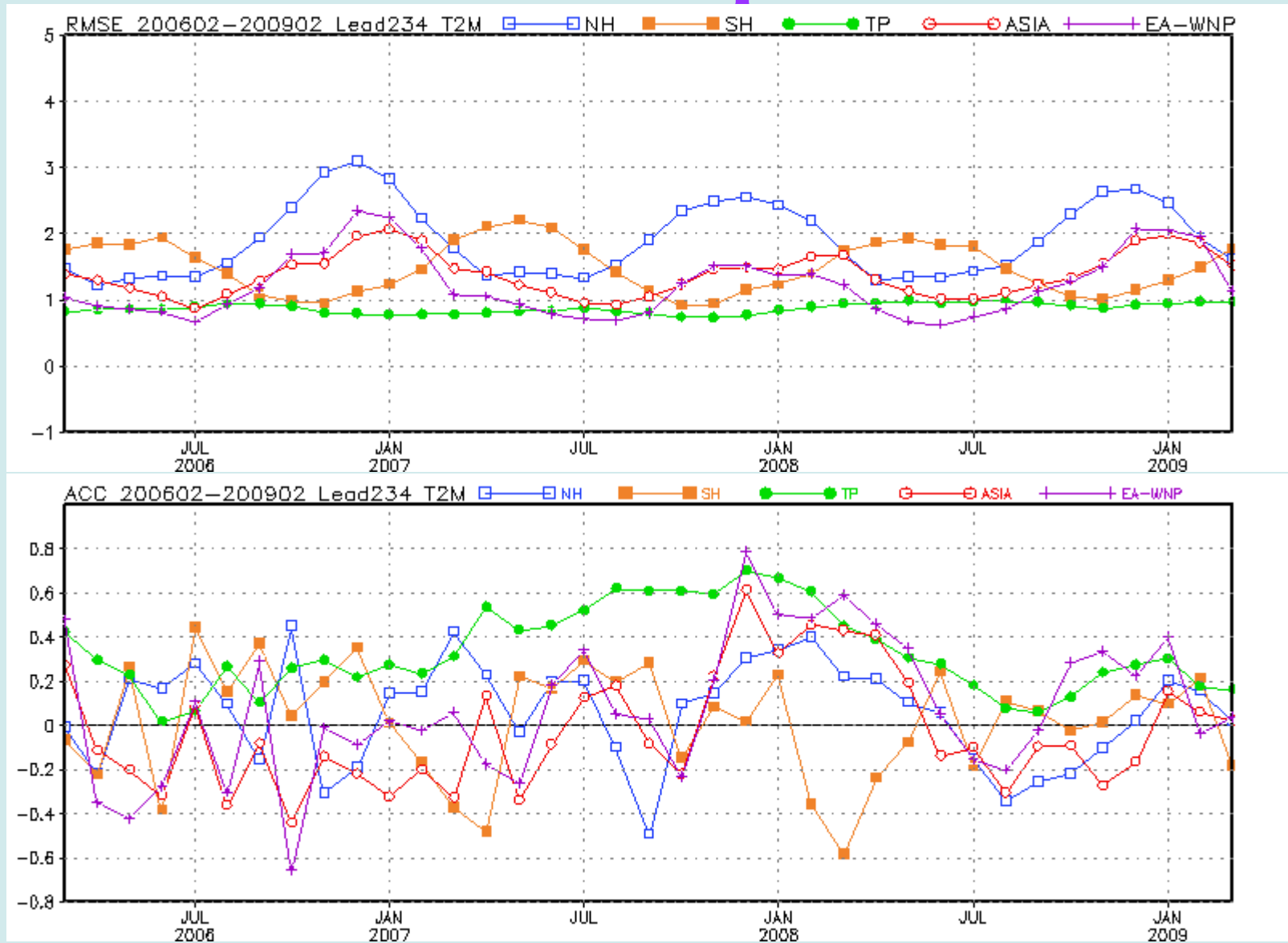


Precipitation



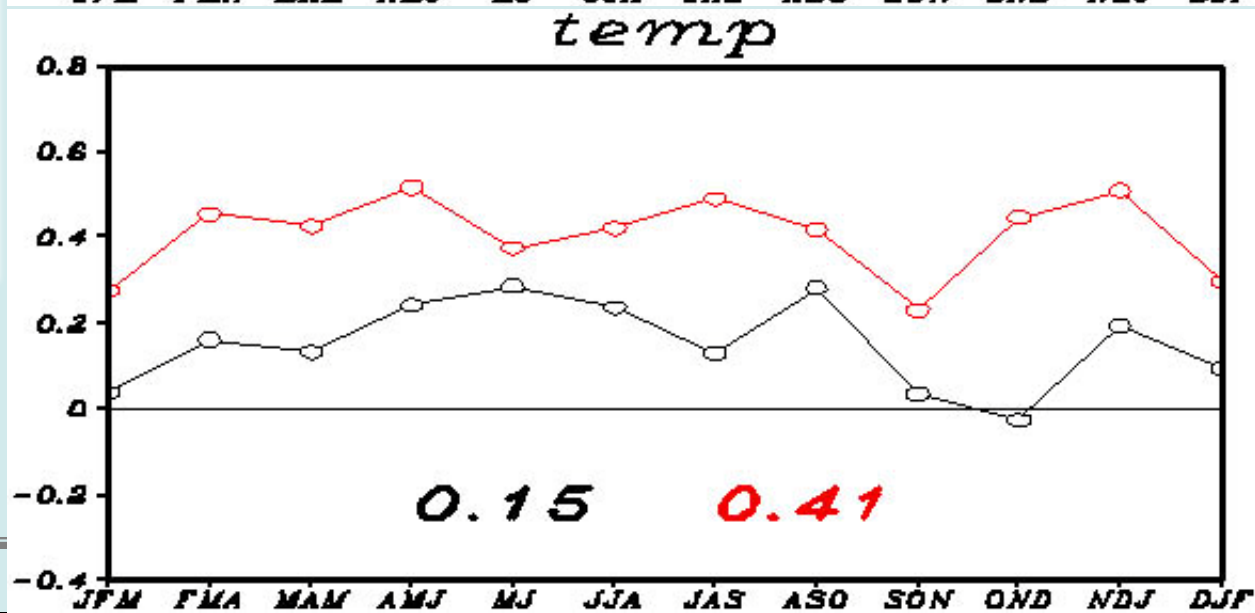
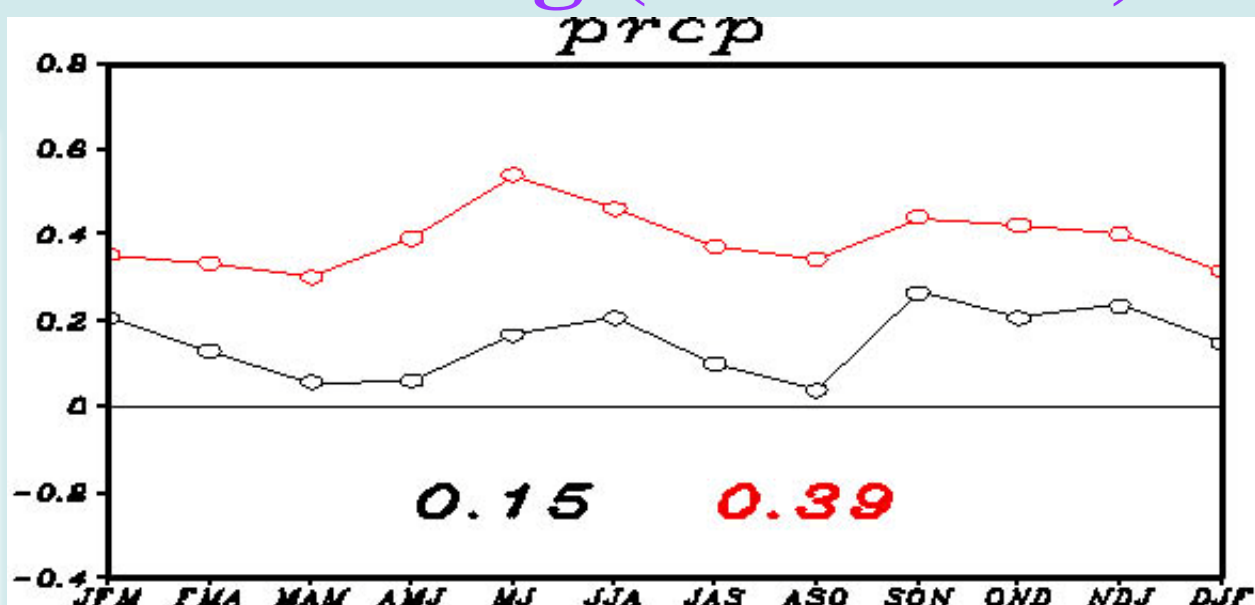
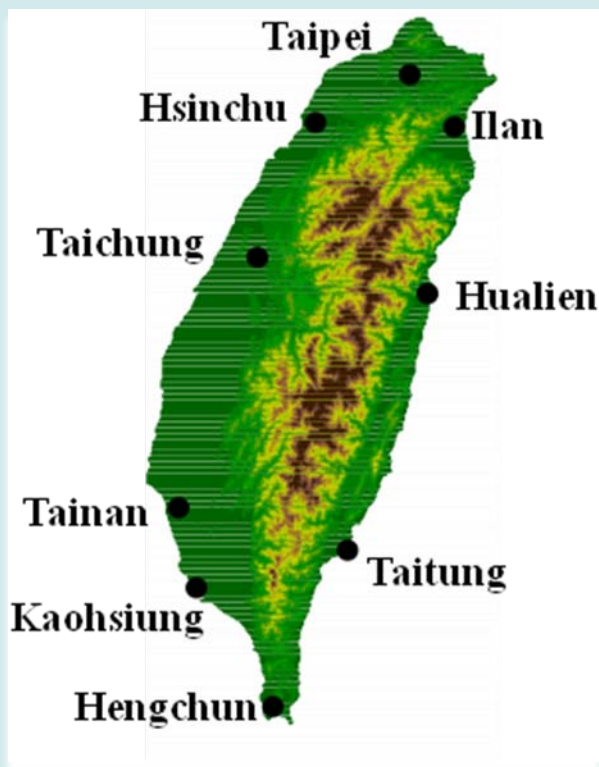


2-meter Temperature



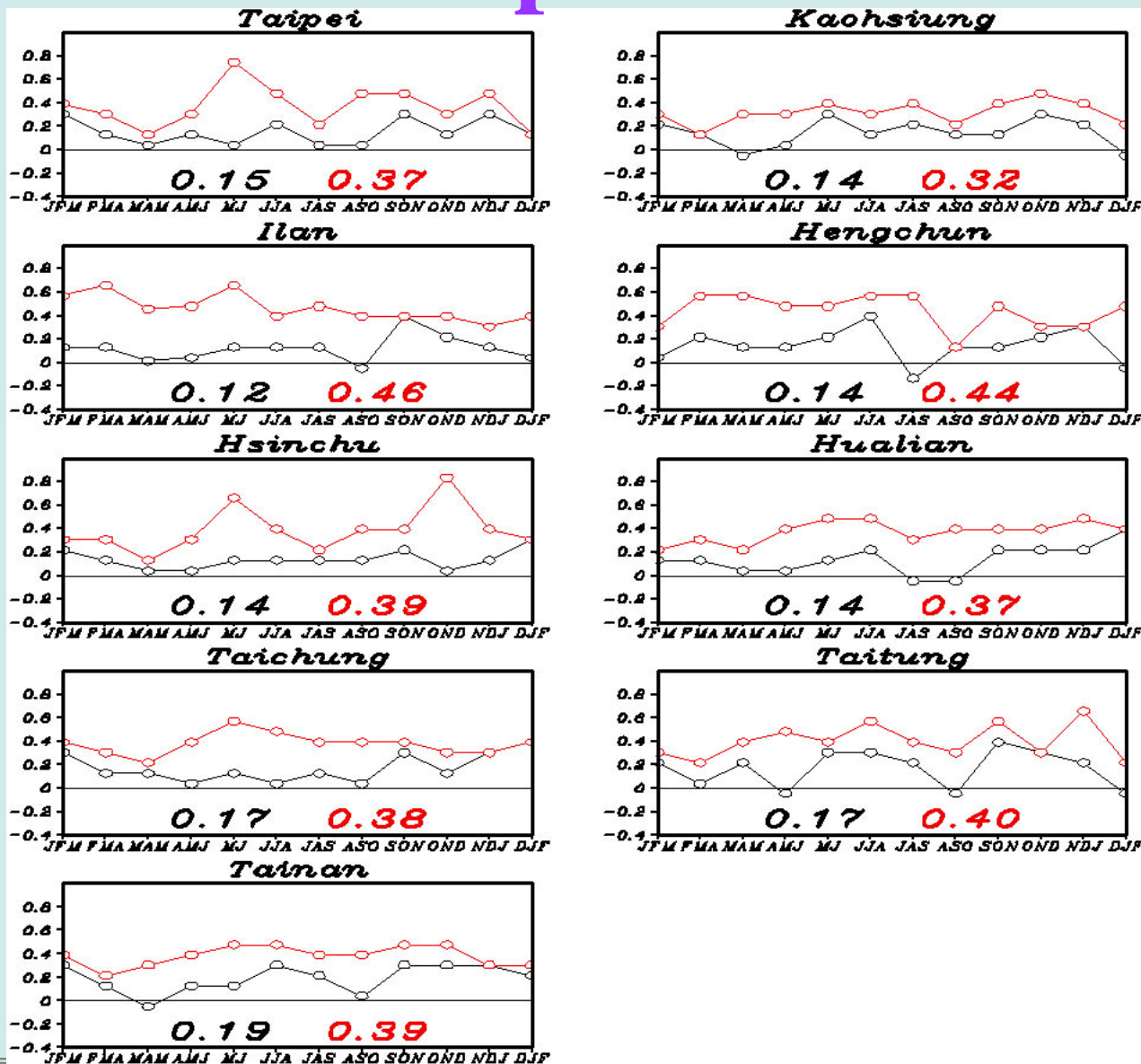


Statistical Downscaling (1981-2008)



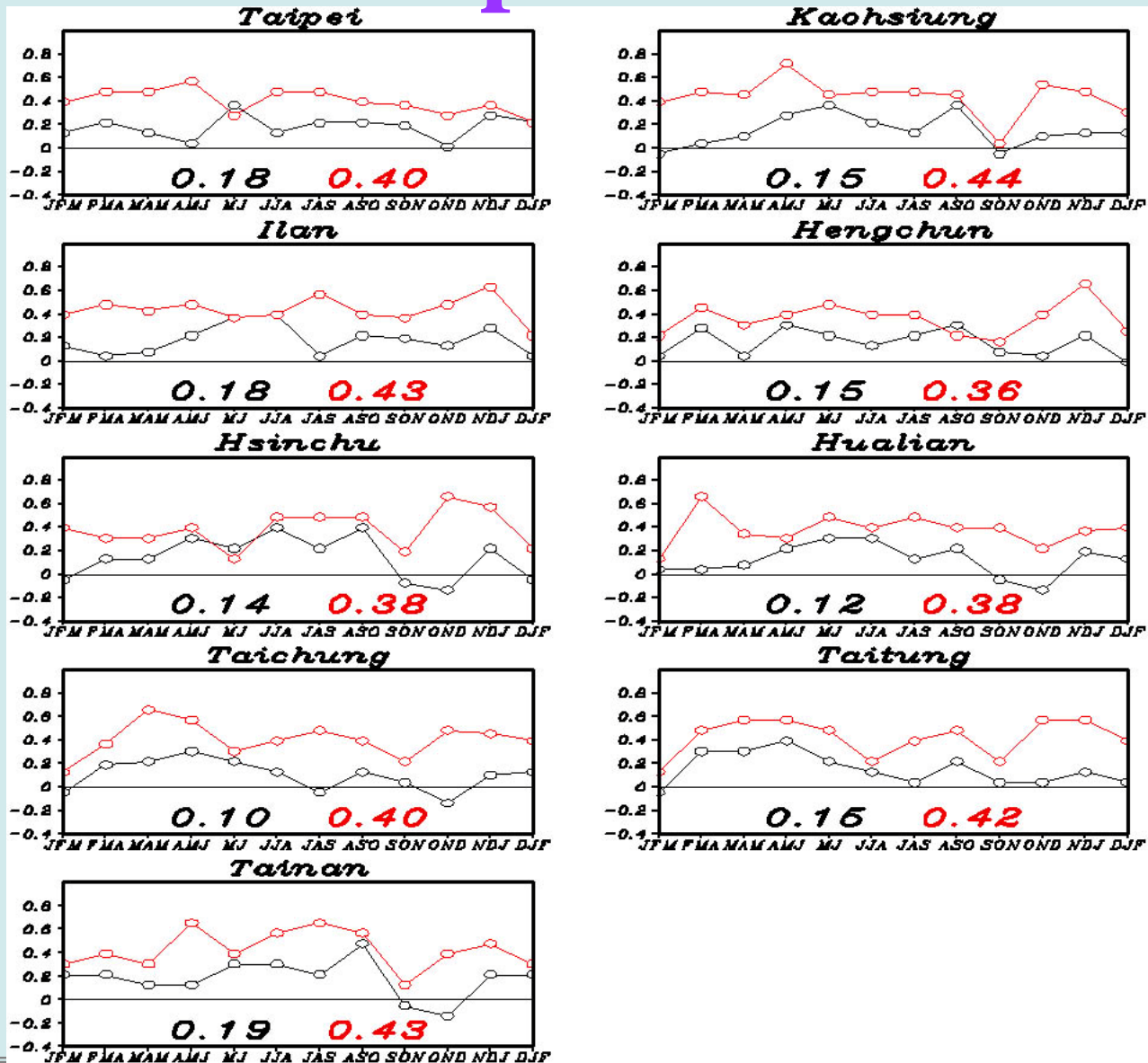


Precipitation





Temperature





Summary

- Skill analysis:
 - Different variables: Ground temperature > 2-meter temperature > precipitation.
 - Different regions: TP --- EA-WNP.
 - EA-WNP → Larger score and more area with skill.
 - Less skill in summer hemisphere.
- Forecast :
 - ACC: TP is the best.
 - Larger RMSE in summer hemisphere (forecast)
- All stations are skillful for both precipitation and temperature in statistical downscaling hindcast.