

**An Overview of Recent Prediction
Activities and Data Products of
NASA's Seasonal to Interannual
Prediction Project (NSIPP)**

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- Overview of NSIPP
<http://nsipp.gsfc.nasa.gov>
- Forecast System
 - Tier I coupled model SST forecasts
 - Tier II atmosphere/land GCM forecasts
 - forced with Tier I SST
 - forced with IRI/NCEP SST
- Some Highlights
 - Recent seasonal forecasts
 - Tier II seasonal hindcasts for 1980-99
(9 member ensemble)
 - AMIP simulations for 1930-99
(9 member ensemble)



NASA Seasonal to Interannual Prediction Project

M. Rienecker, M. Suarez, D. Adamec, R. Koster, S. Schubert, J. Hansen
NASA/GoddardSpace Flight Center

GOAL

To develop an assimilation and forecast system based on a coupled atmosphere-ocean-land-surface-sea-ice model capable of using a combination of satellite and *in situ* data sources to improve the prediction of ENSO and other major S-I signals and their global teleconnections.

OBJECTIVES

Demonstrate the utility of satellite data [esp. surface height, air-sea fluxes, soil moisture] in a coupled model prediction system.

Aid in the design of the observing system for short-term climate prediction by conducting OSSE's and predictability studies.

Contribute to national and international multi-model ensemble forecasts

APPROACH

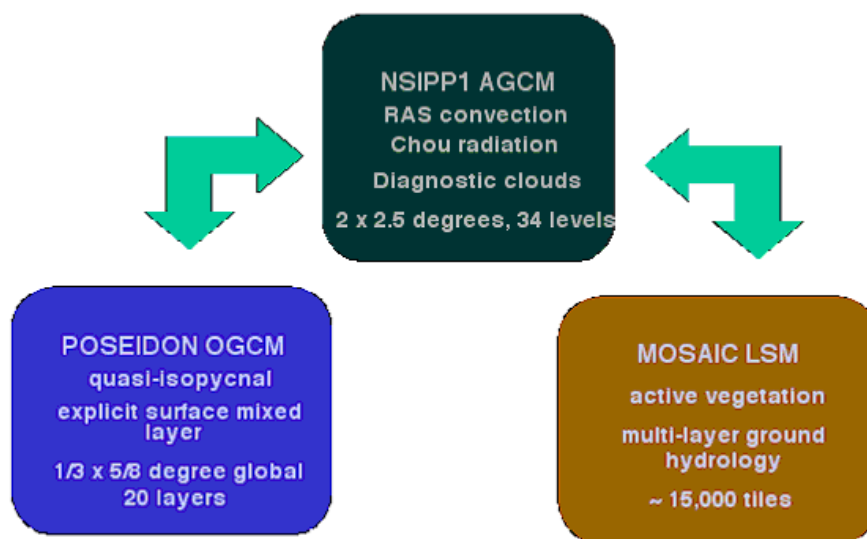
Tier-1: coupled ocean-atmosphere-land

- initialize ocean, esp. with satellite data
- ensembles from different ocean states

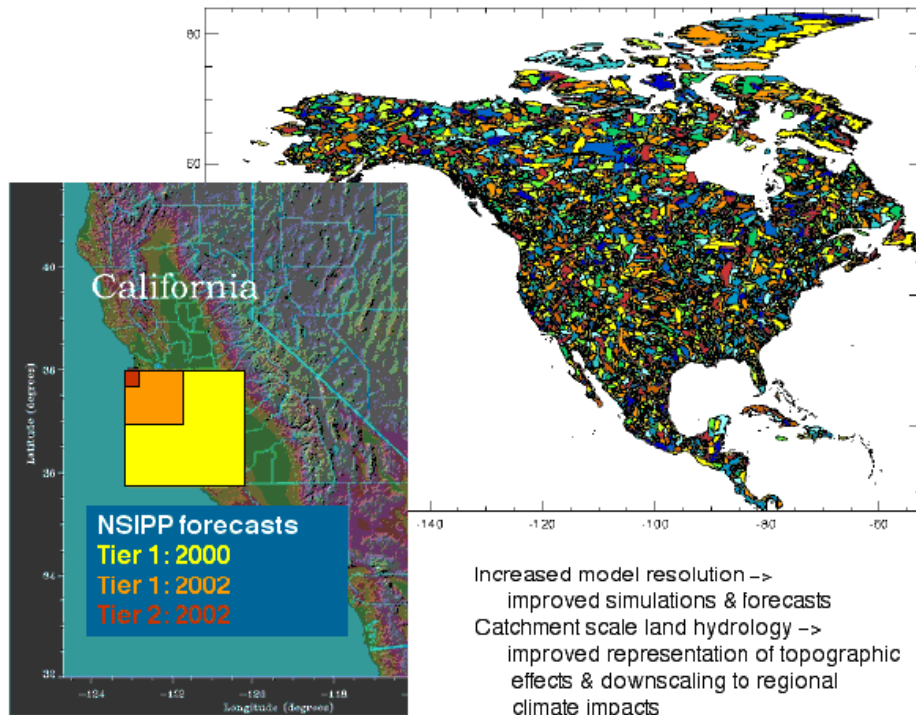
Tier-2: coupled atmosphere-land

- large ensembles: 120-day forecasts
- use forecast SST from Tier-1, NCEP, et al.
- initialize land, esp. with satellite data
- variable atmosphere resolution

NSIPP CGCM COMPONENTS

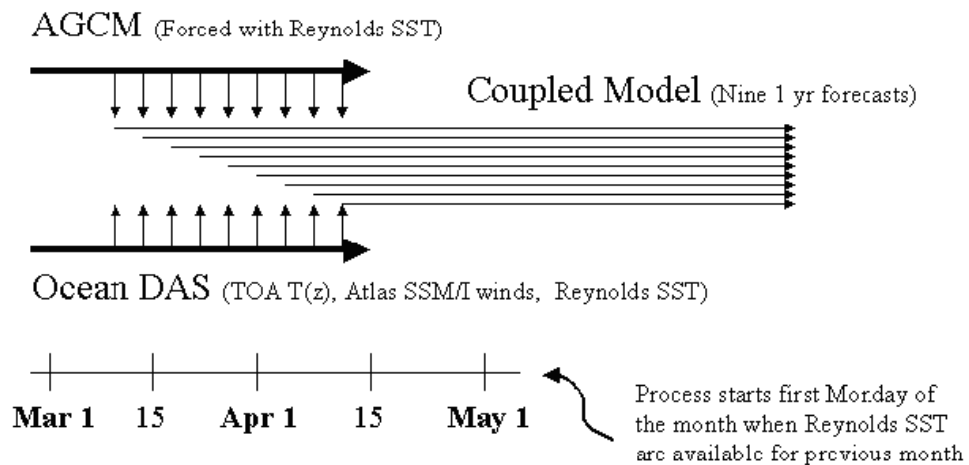


NO FLUX CORRECTION



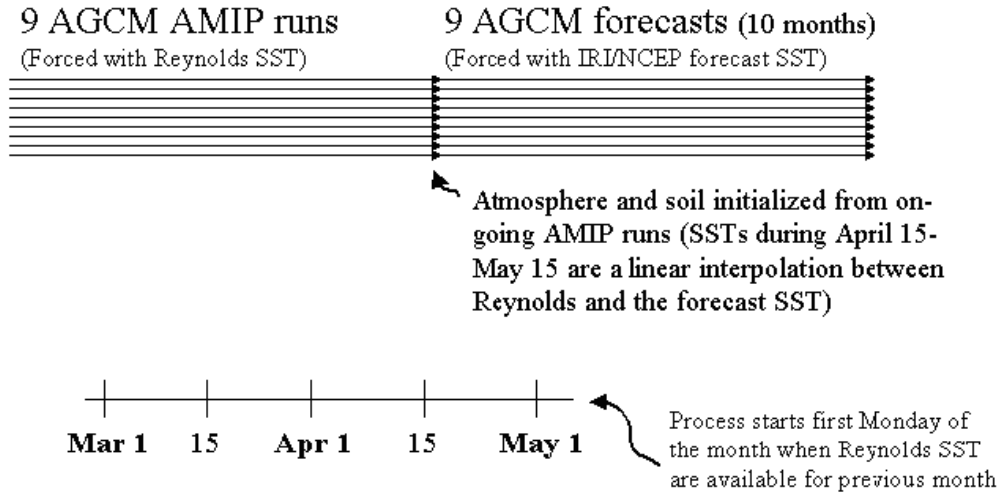
Tier I Coupled Forecasts

(initialization centered on April 1)



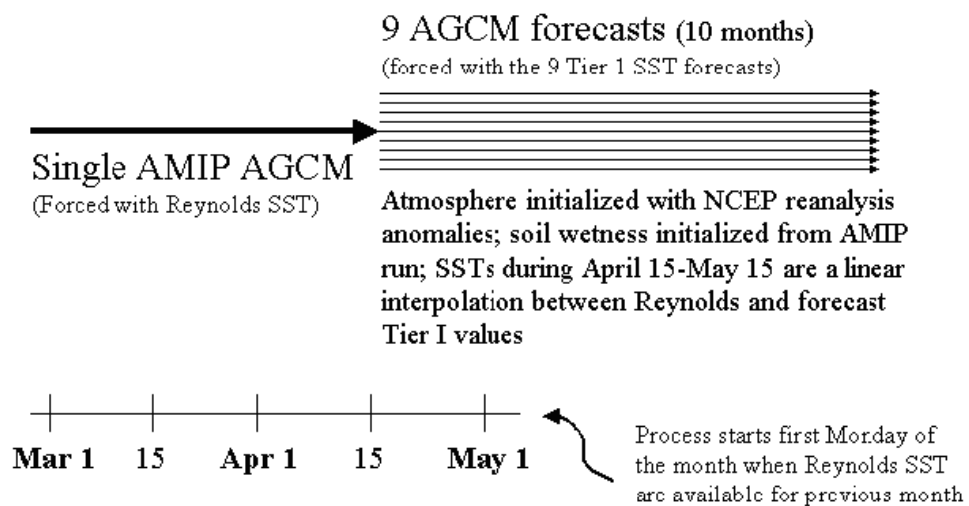
Tier II AGCM Forecasts

(Initialized April 15)



Tier II AGCM Forecasts

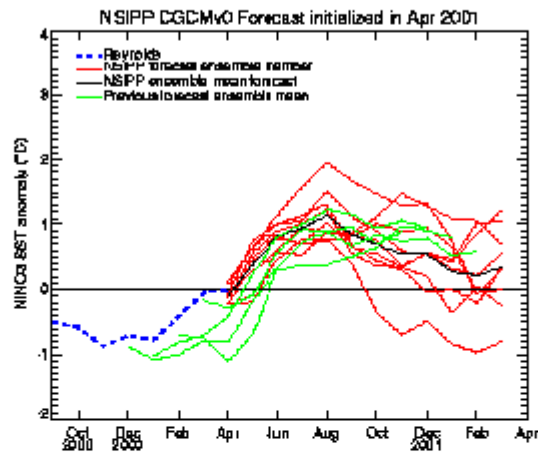
(Initialized April 15)



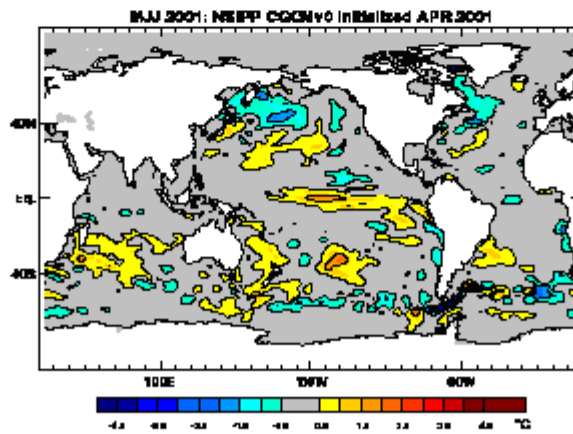


Ensemble forecasts from April 2001 initialization

NINO-3 SST anomaly

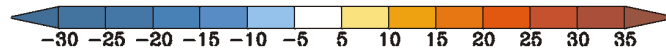
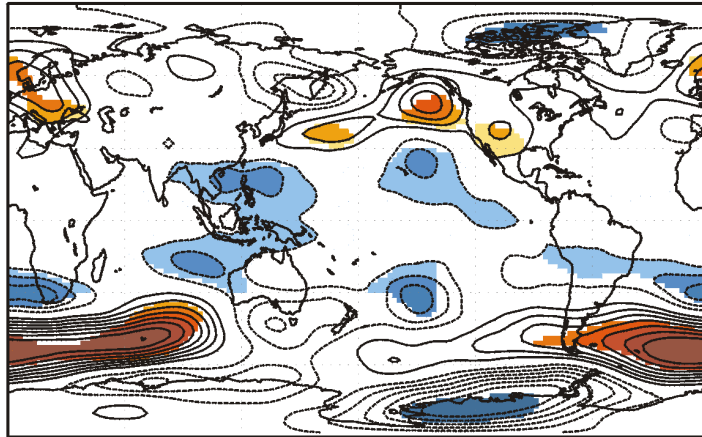


Ensemble mean forecast SST anomaly for MJJ 2001

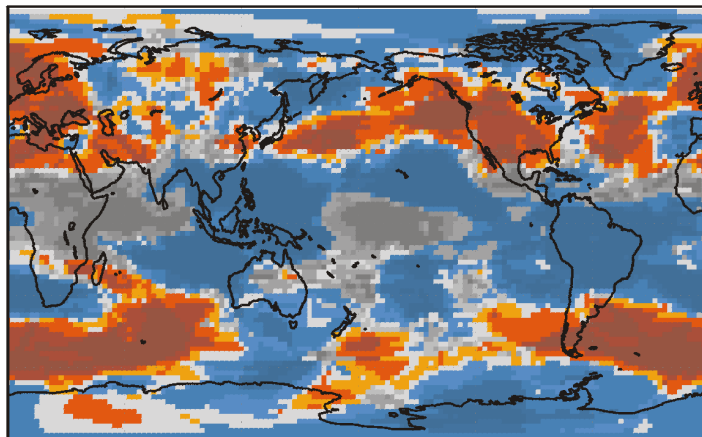


MJJ NSIPP Tier II 500 mb Height Anomaly Forecast init 4/2001

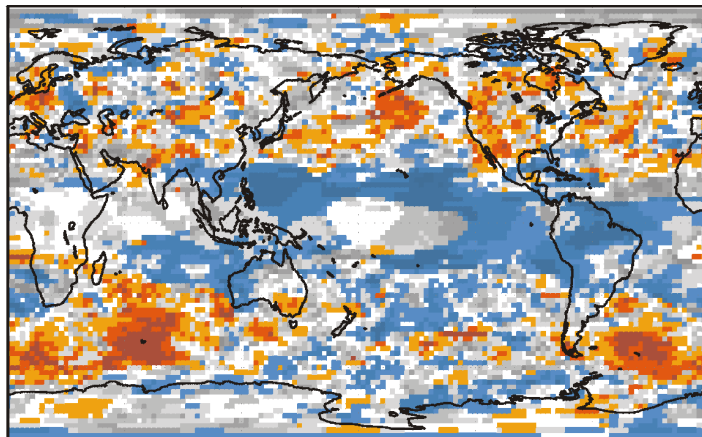
Ensemble Mean [m]



Categorical Forecast

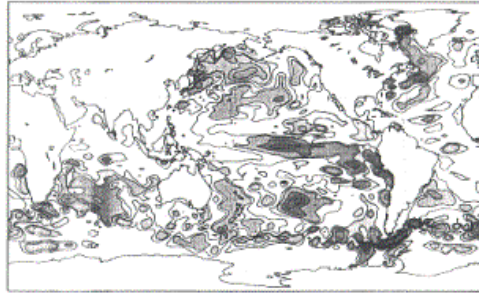


Calibrated forecast

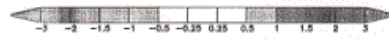
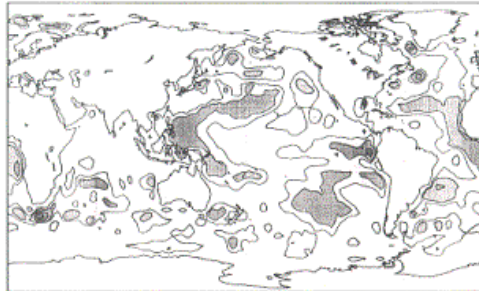


MJJ 2001 SST Anomaly
Forecast init 4/2001

NSIPP Tier I



NCEP/IRI

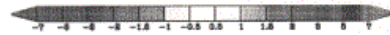


MJJ NSIPP Tier II Surface Temperature Anomaly [C]
Forecast init 4/2001

Based on NSIPP Tier I SST

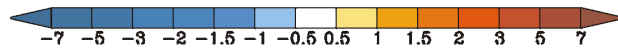
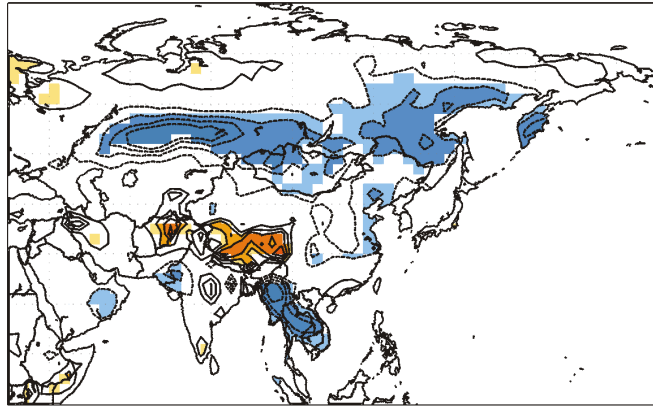


Based on NCEP/IRI SST

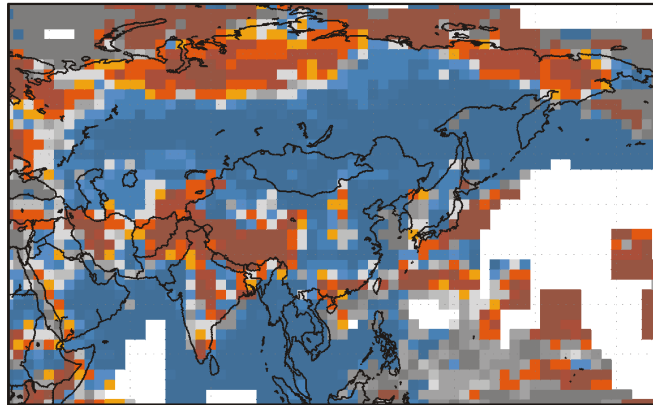


MJJ NSIPP Tier II Surface Temperature Anomaly Forecast init 4/2001

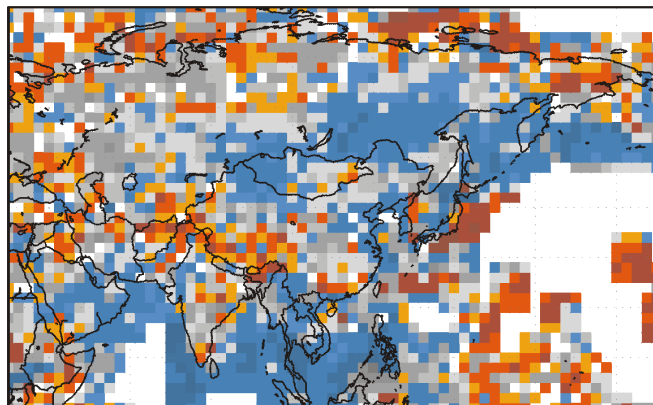
Ensemble Mean [C]



Categorical Forecast



Calibrated forecast



Tier II Hindcasts and AMIP simulations (NSIPP-1 AGCM)

Climate Atlas

Bacmeister, J., P.J.Pegion, S.D.Schubert, and M.J.Suarez, 2000: An atlas of seasonal means simulated by the NSIPP 1 atmospheric GCM, NASA Tech. Memo. No. 104606, volume 17, Goddard Space Flight Center, Greenbelt, MD 20771, 2000.

Predictability Atlas

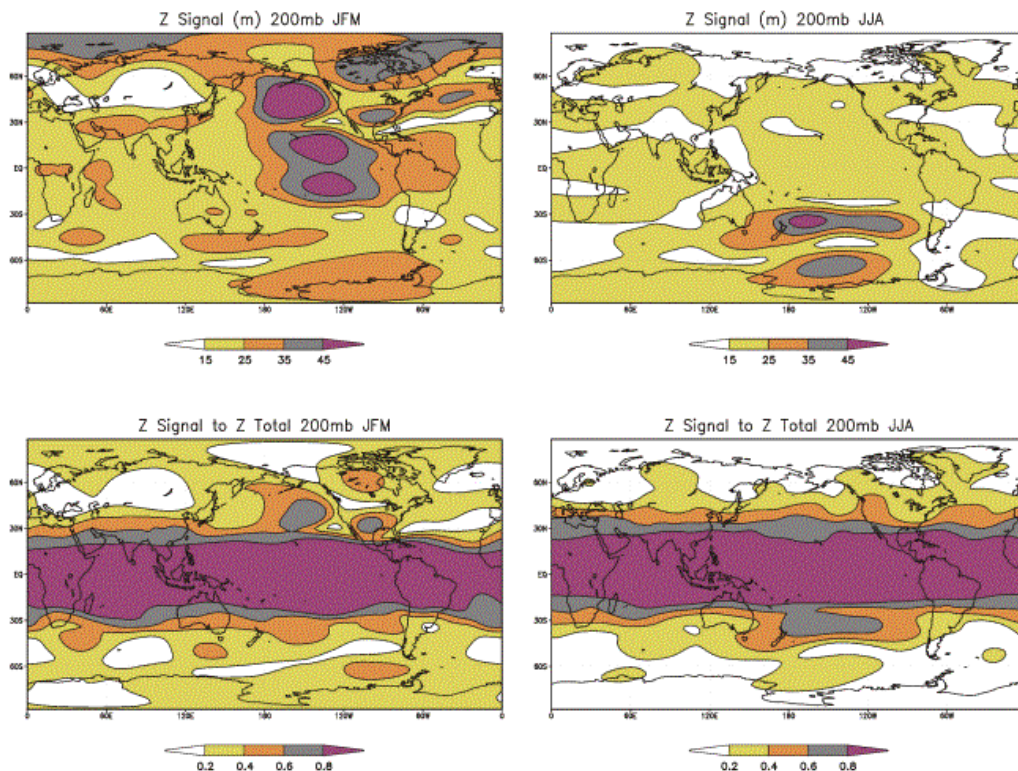
Pegion, P.J., S.D.Schubert, and M.J.Suarez, 2000: An assessment of the predictability of northern winter seasonal means with the NSIPP 1 AGCM, NASA Tech. Memo. No. 104606, volume 18, Goddard Space Flight Center, Greenbelt, MD 20771, 2000.

Data availability : Hindcasts and AMIP runs

<http://janus.gsfc.nasa.gov/~mkistler/cgi-bin/n2index.html>

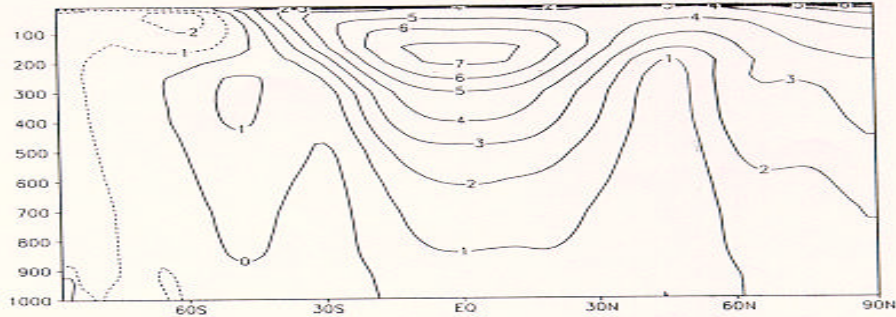
Selected research results

- Northern summer response to SST
- United States droughts

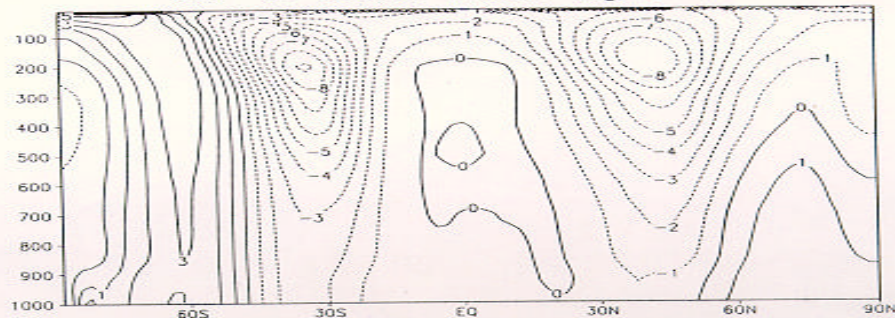


Signal

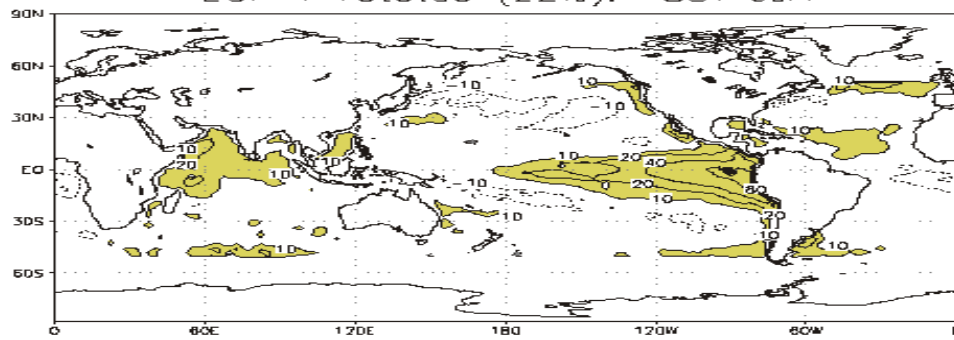
EOF 1 Zonal mean Hght: JJA (1980-99)



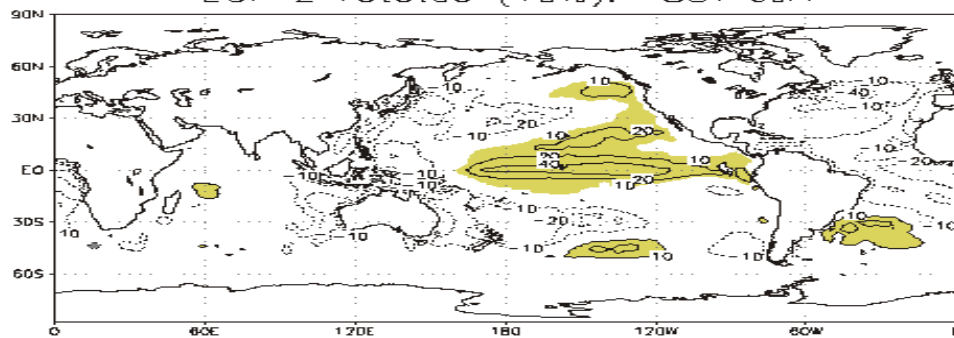
EOF 2 Zonal mean Hght: JJA (1980-99)



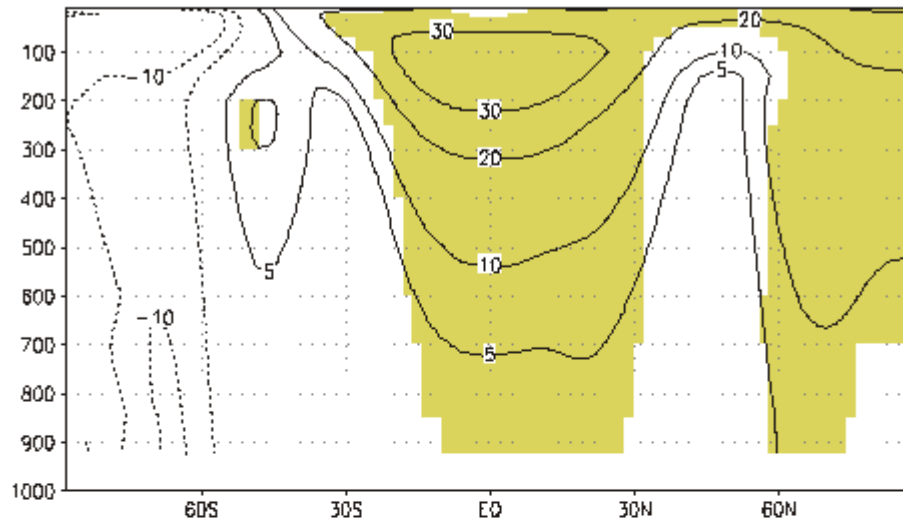
EOF 1 rotated (22%): SST JJA



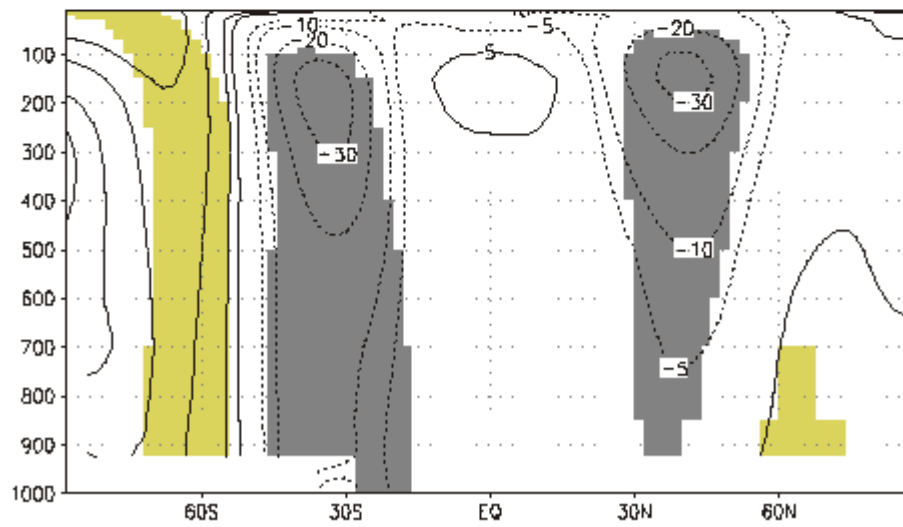
EOF 2 rotated (19%): SST JJA



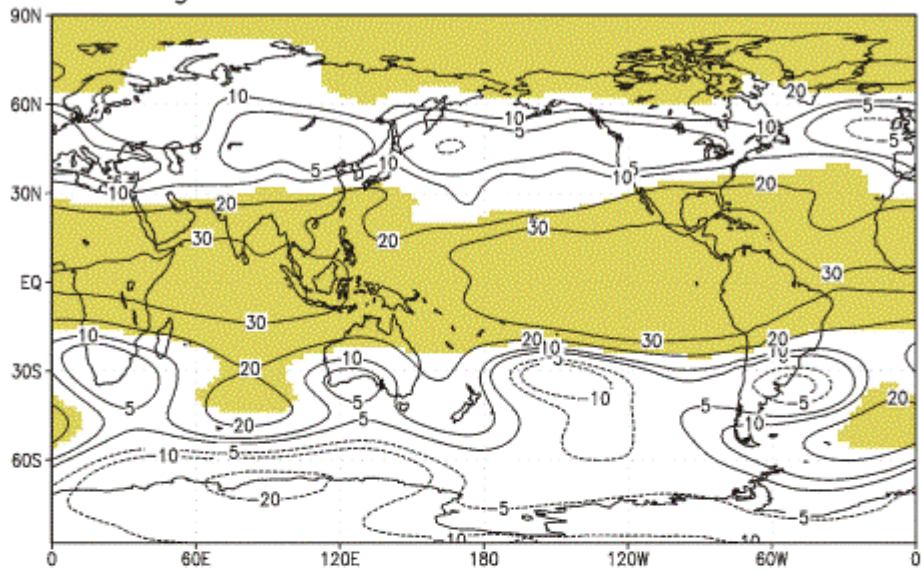
Regress [z] vs PC1 SST: JJA 80-99



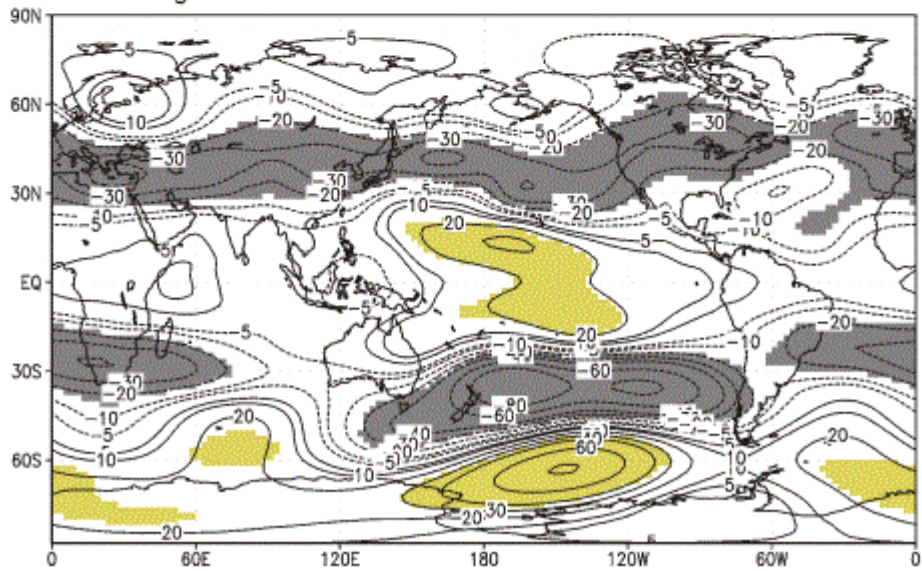
Regress [z] vs PC2 SST: JJA 80-99



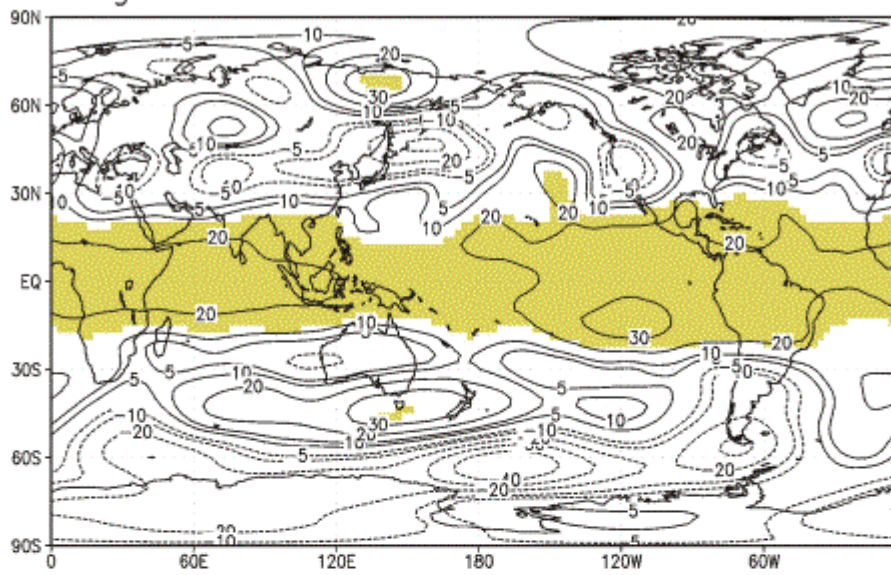
Regress z200 vs PC1 SST: JJA 80-99



Regress z200 vs PC2 SST: JJA 80-99



Regress z200 NCEP vs PC1 SST: JJA 80-99



Regress z200 NCEP vs PC2 SST: JJA 80-99

