

ENSO Modeling at GFDL

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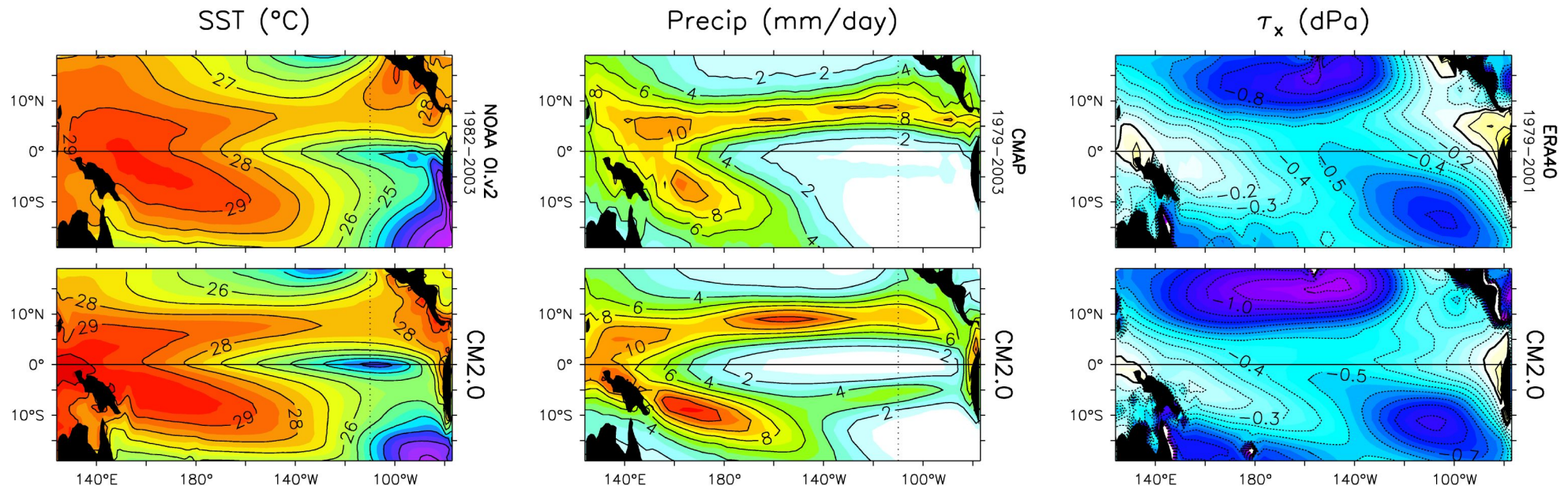
Matt Harrison

Isaac Held

Tom Knutson

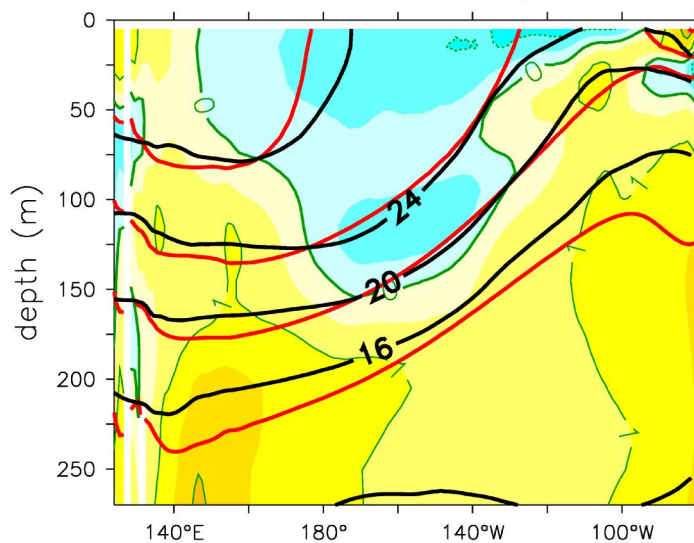
and the GFDL Model Development Teams

Simulated annual-mean climate



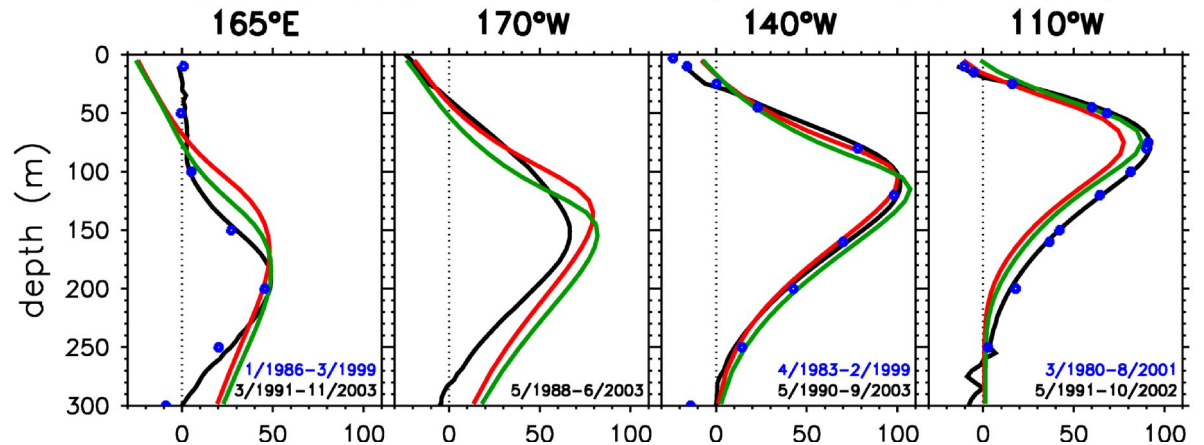
Temperature (°C) at Equator

Assim (1980-1999), CM2.0 (bias shaded)



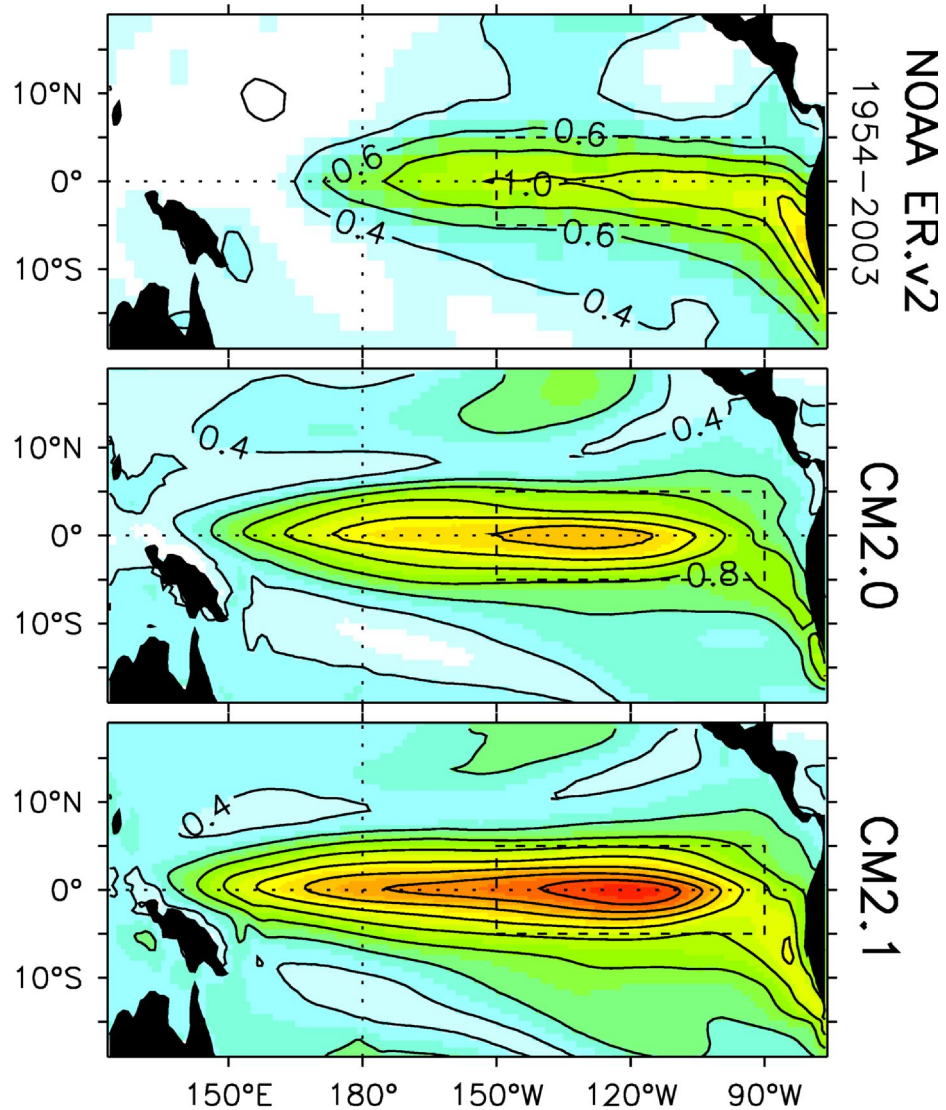
(b) Subsurface U (cm/s) at equator

CM2.0, CM2.1 vs. TAO obs (ADCP & fixed-depth)

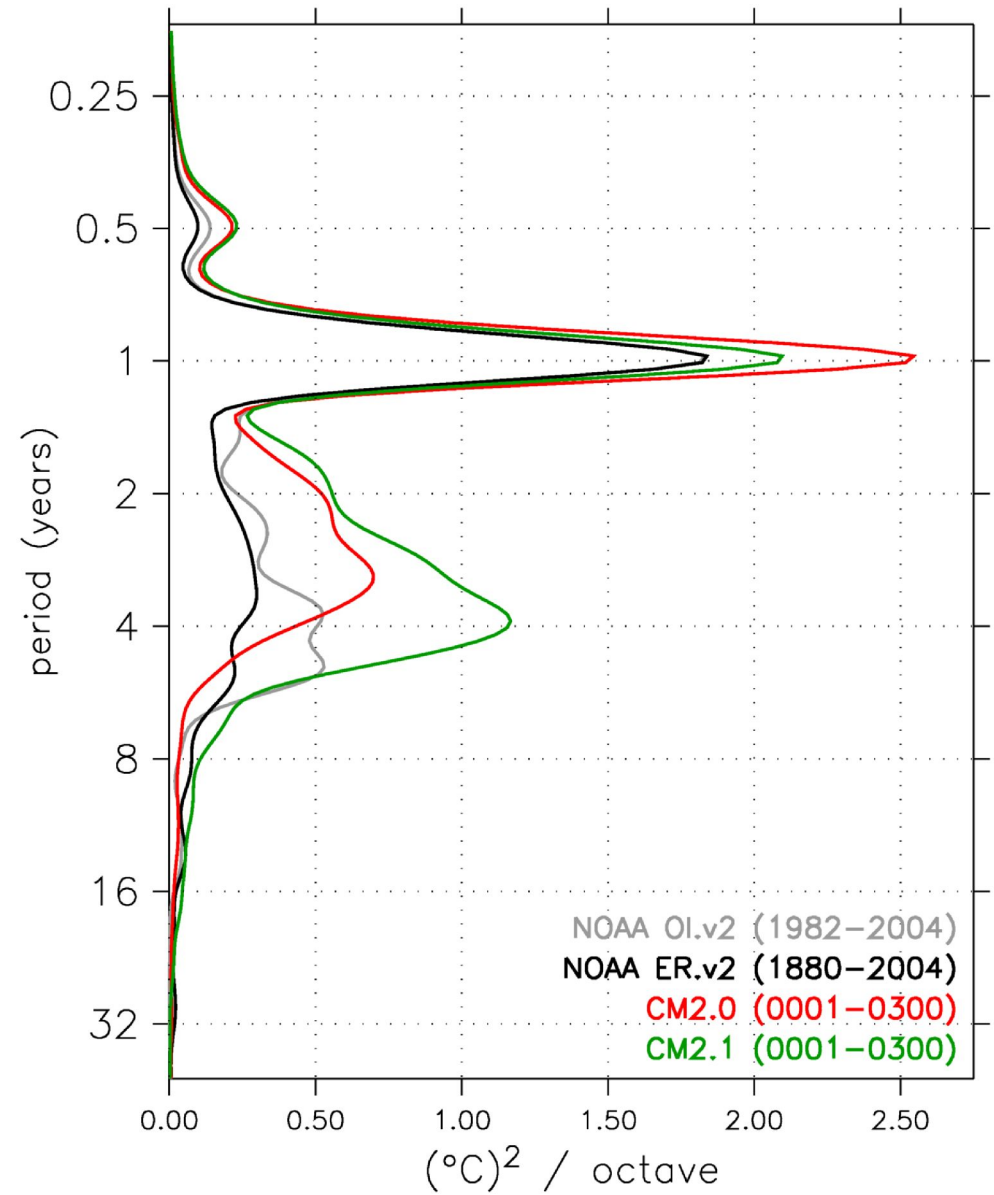


Simulated ENSO

Stddev of Interannual SSTA ($^{\circ}\text{C}$)

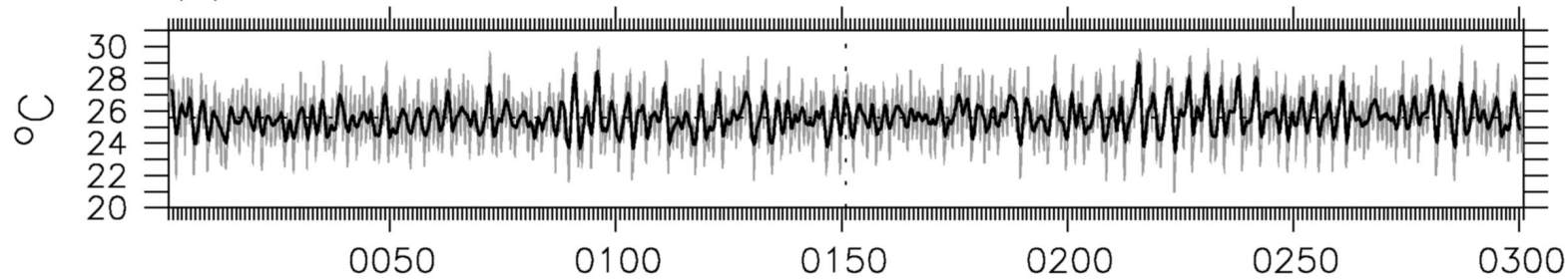


NINO3 SSTA spectra

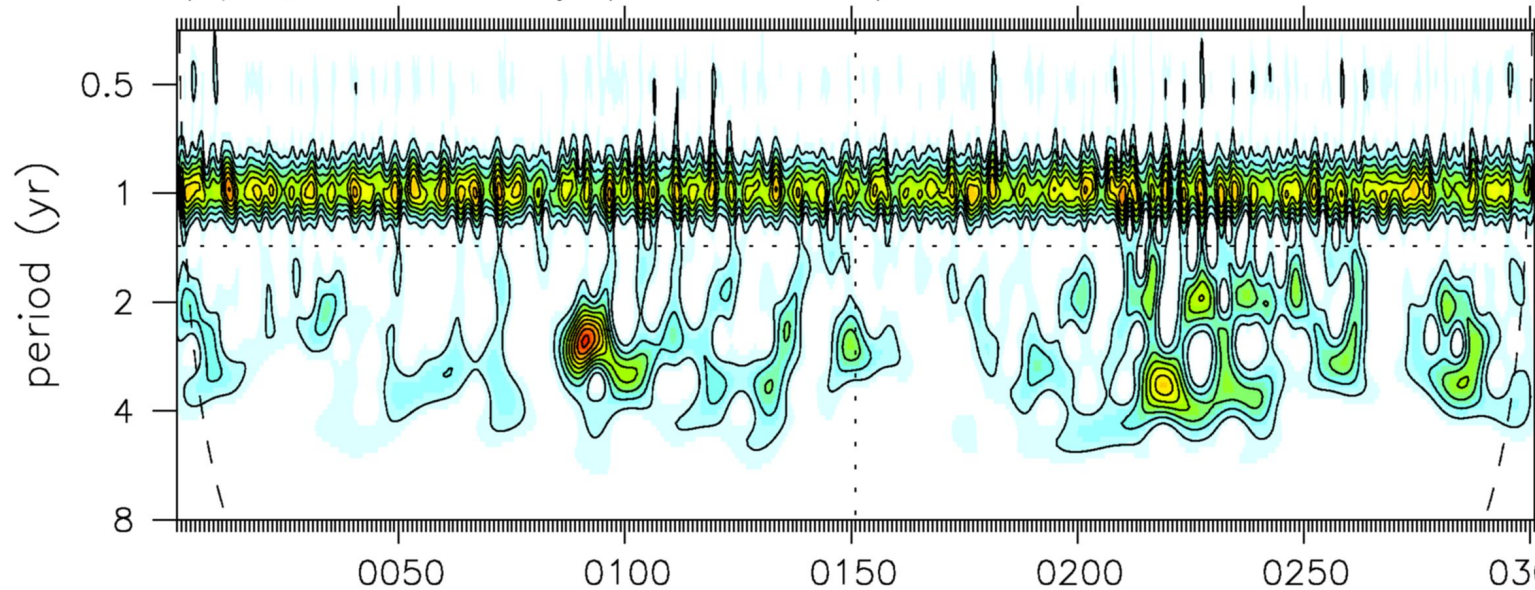


Modulation of ENSO

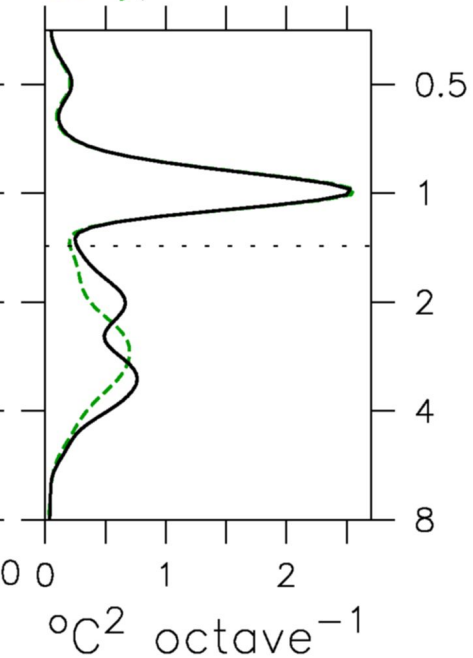
(a) CM2.0 NINO3 SST



(b) Spectral density ($^{\circ}\text{C}^2 \text{ octave}^{-1}$)



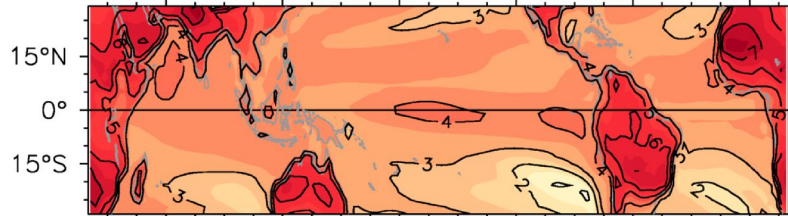
(c) Mean spectra, early/late epochs



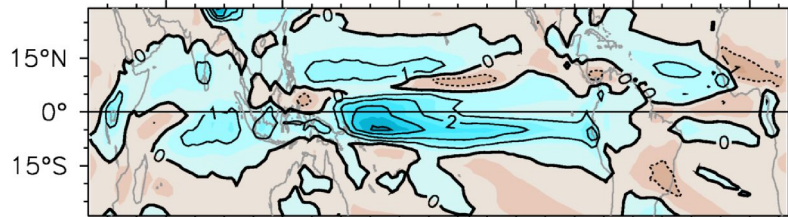
Greenhouse response

Simulated changes: 4xCO2 minus 1860

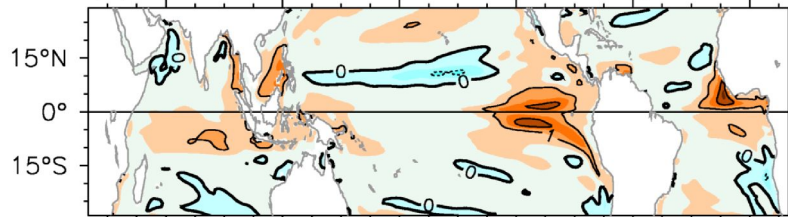
(a) Surface temperature (°C)



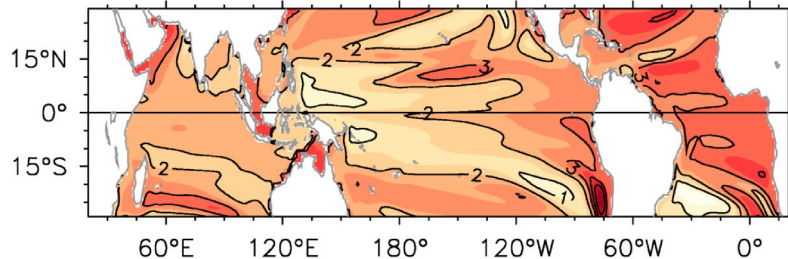
(b) Precipitation (mm/day)



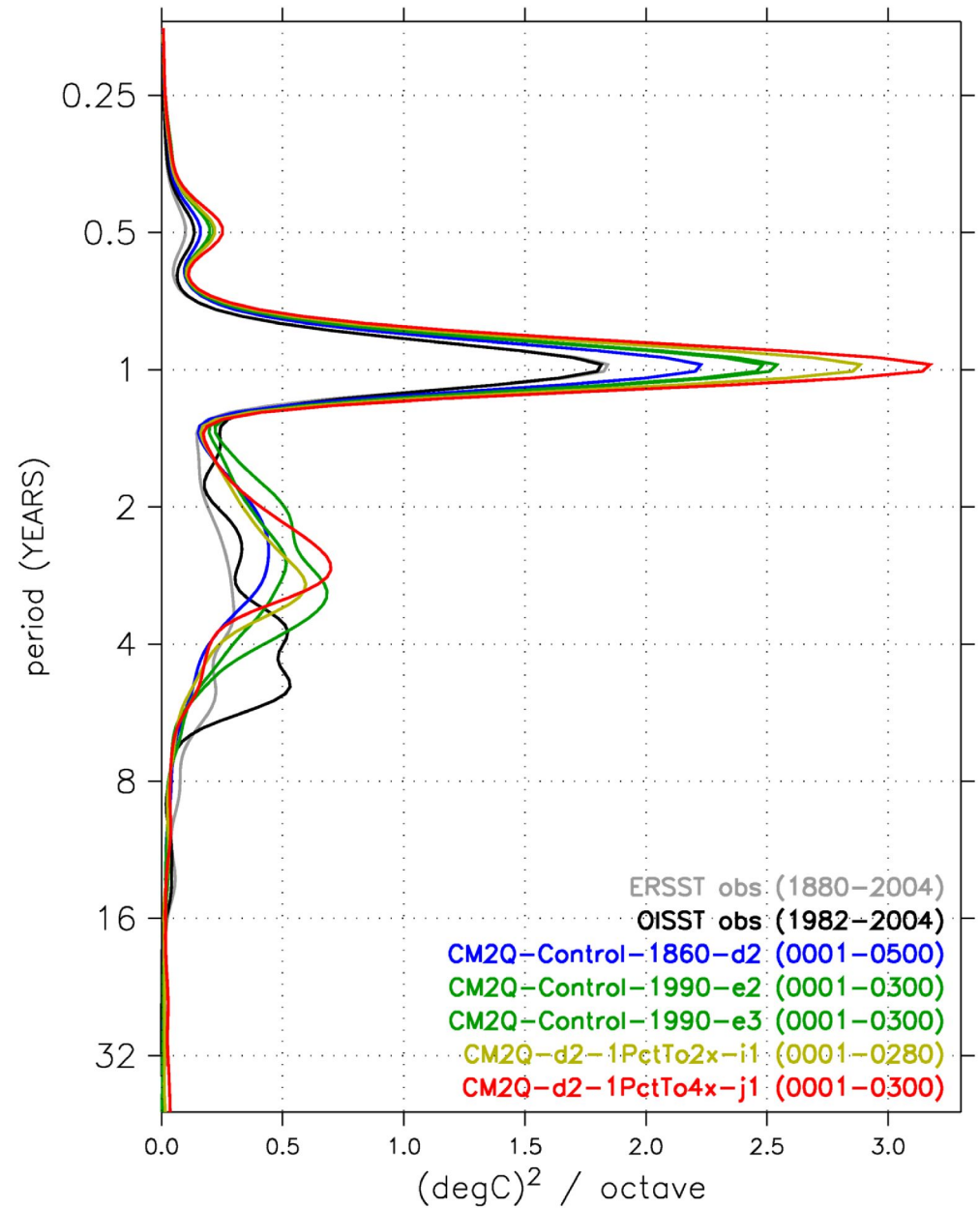
(c) SST minus 50m temperature (°C)



(d) Temperature of top 300m (°C)

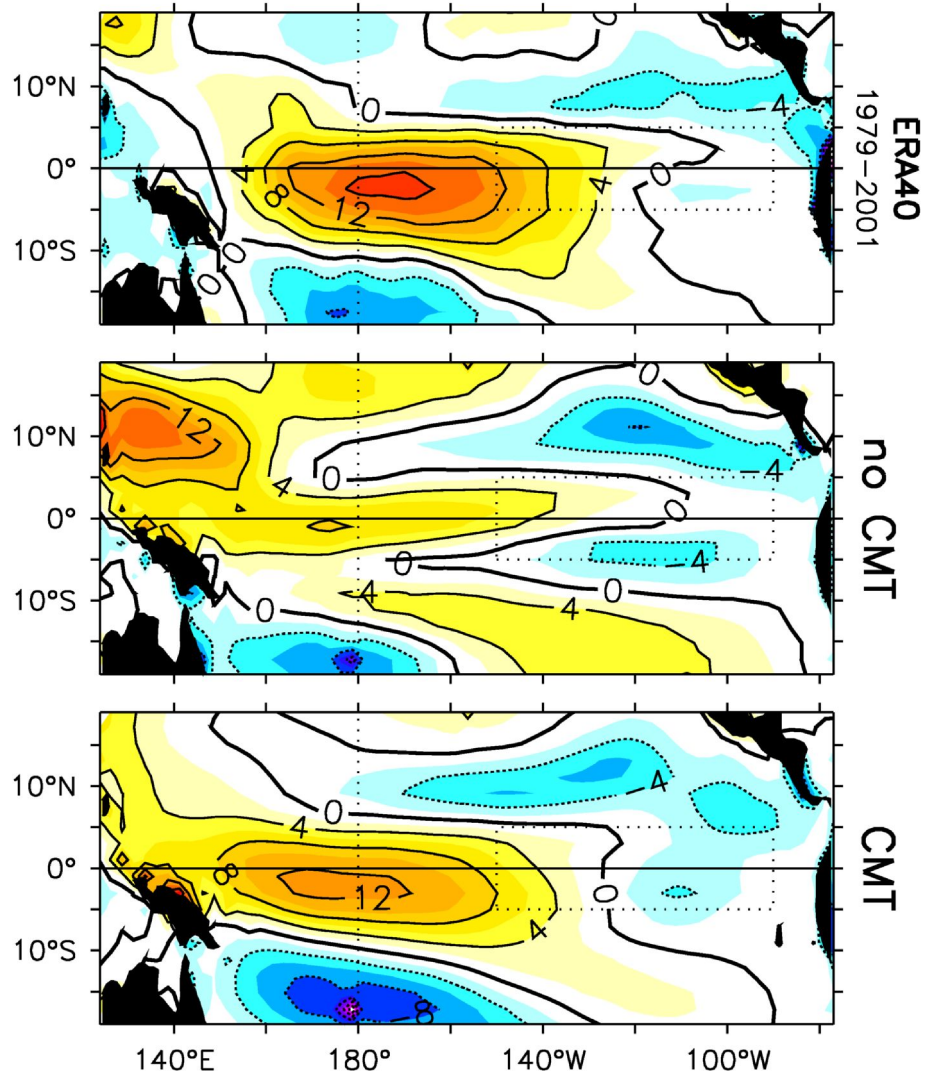


NINO3 SST spectra

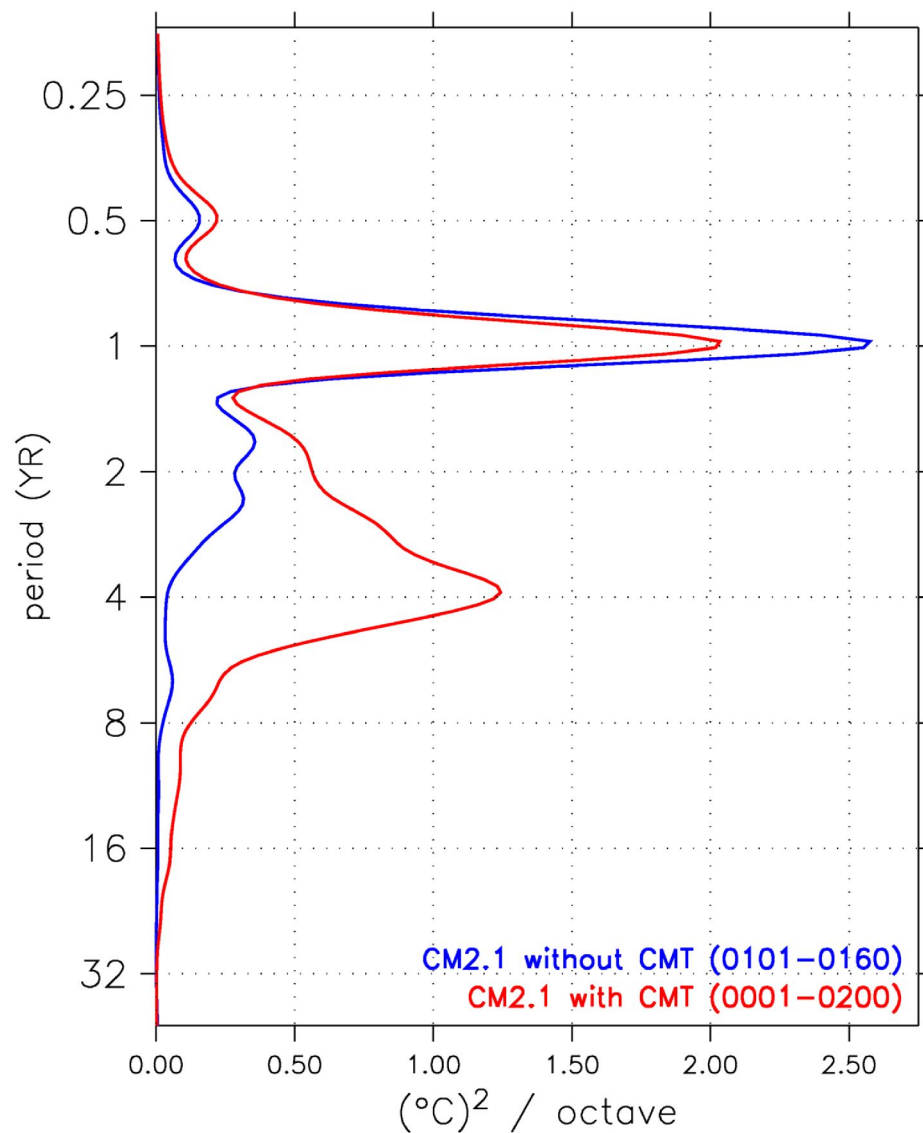


Sensitivities: Cumulus Momentum Transport

τ_x regr on NIN03 SSTA



NIN03 SST spectra



Annular Modes

