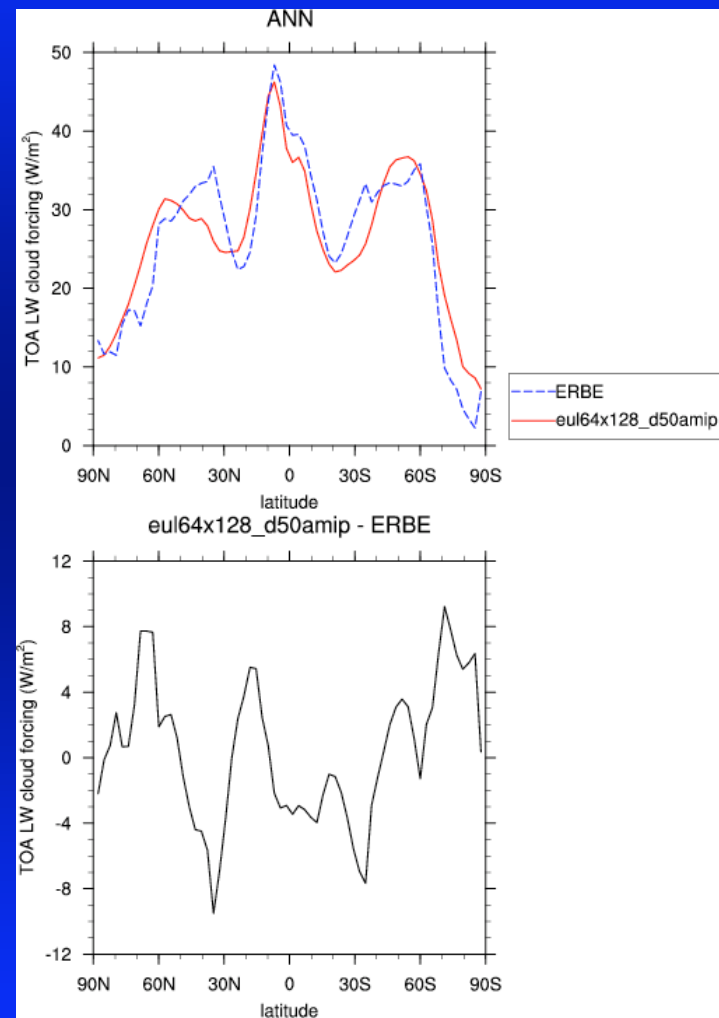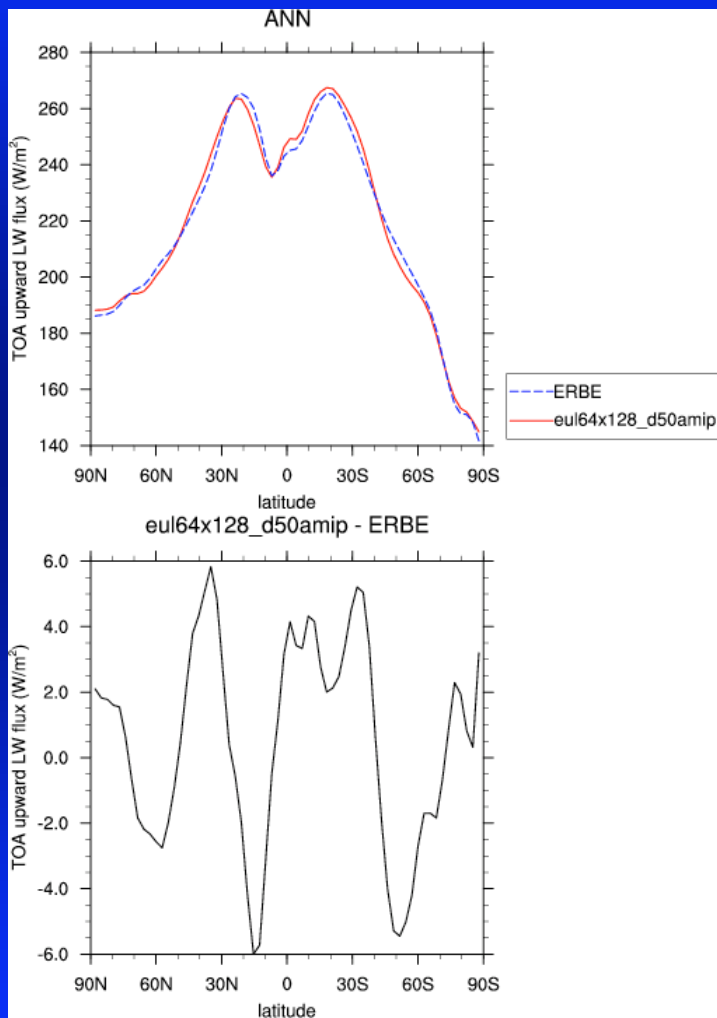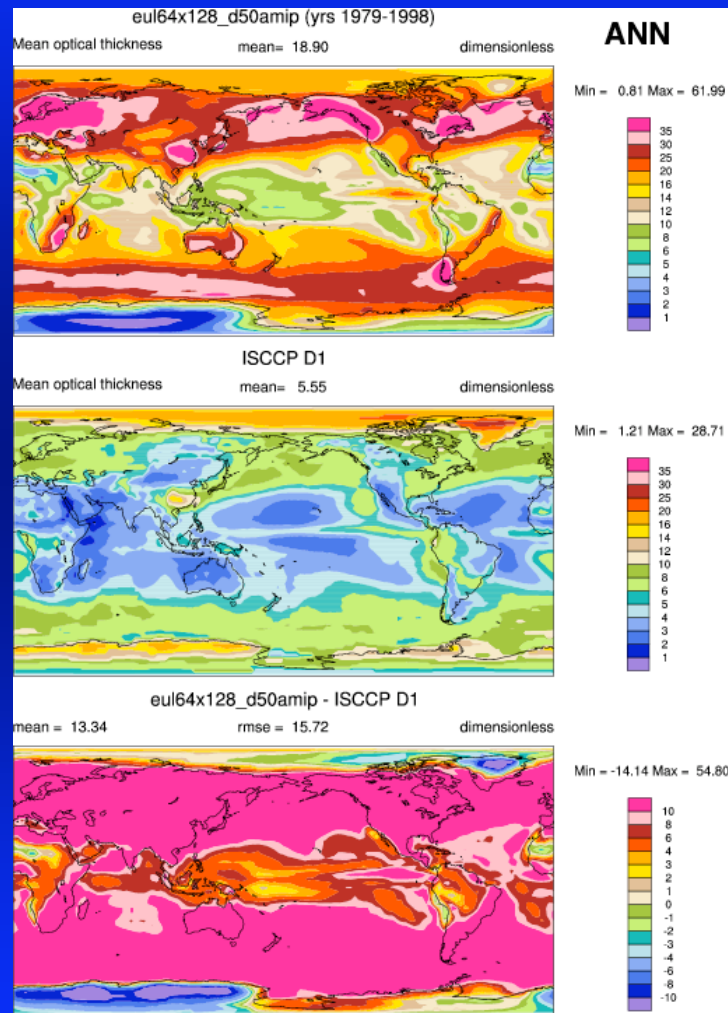# Model/Observation Comparisons

Bill Collins

National Center for Atmospheric Research

Boulder, Colorado

- Atmosphere:
    - Traditional metrics for clouds and radiation
    - Need for new metrics for cloud systems
- Land:
    - Sensitivity to land-surface albedos
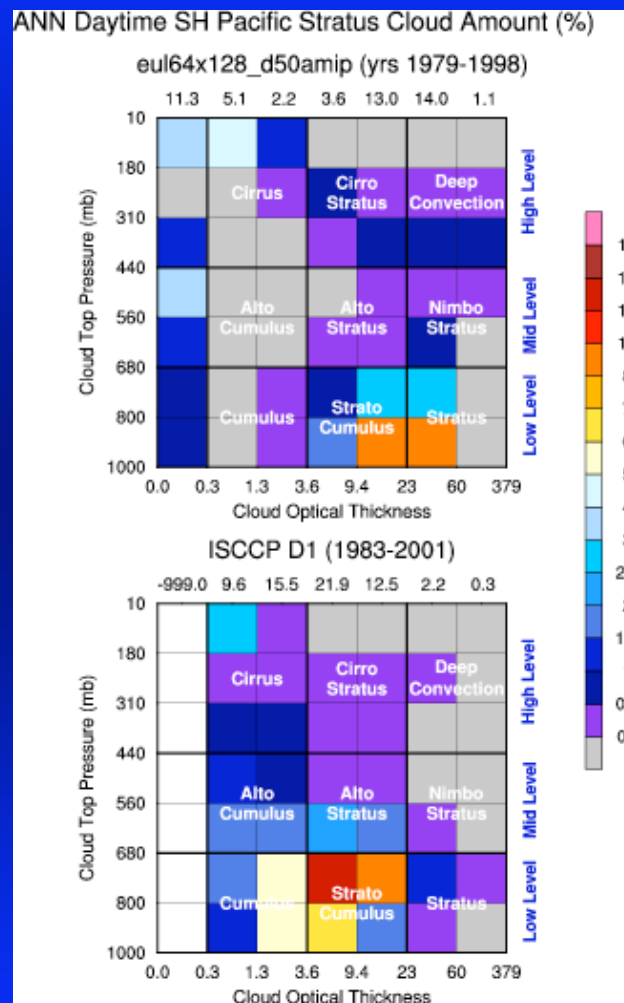- Ocean:
    - Sensitivity to coastal insolation

TOA Zonal Mean Radiation

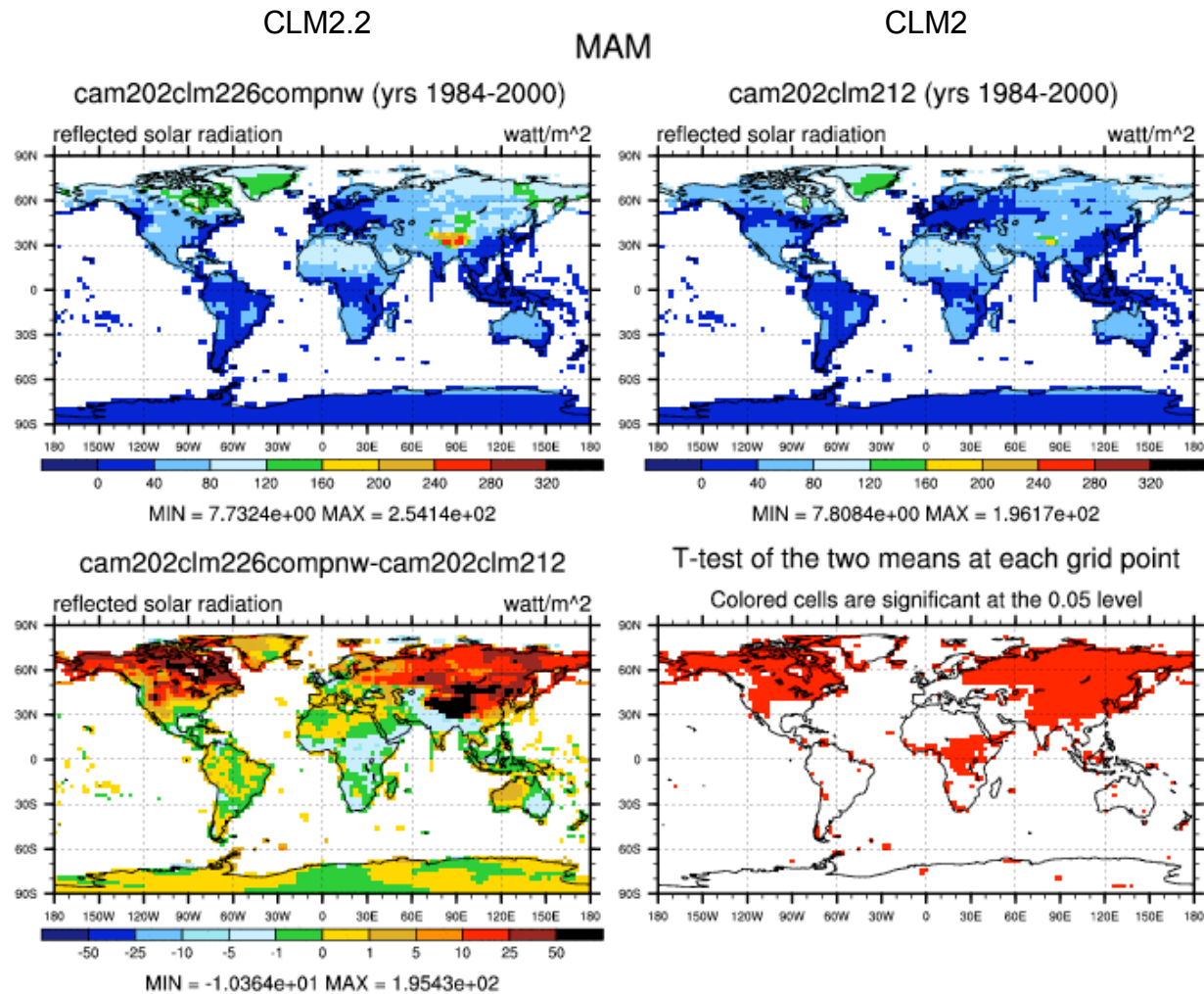# Disagreement in Cloud Properties: Model - Obs

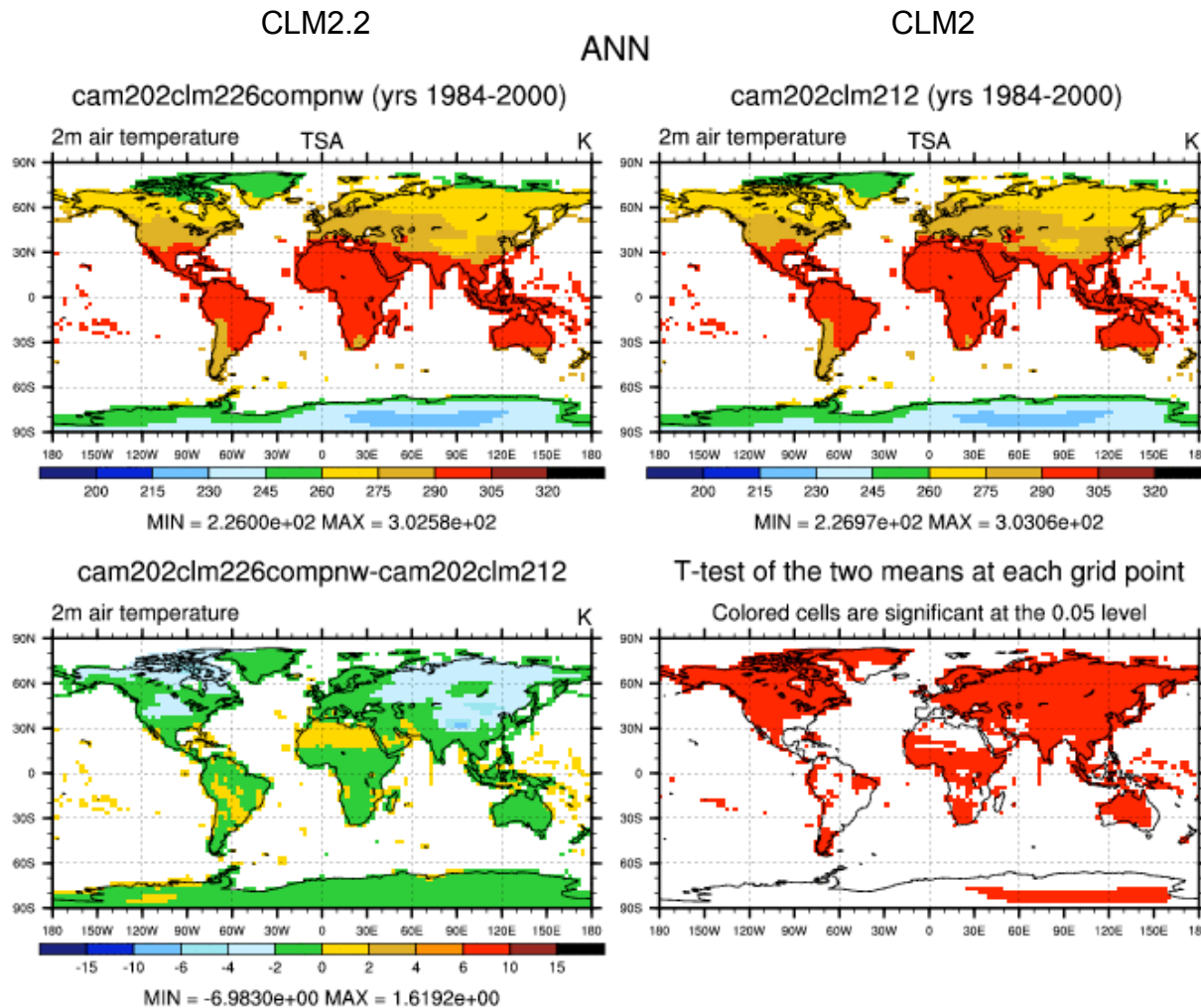# Methods for Analyzing Cloud Physical Properties:
ISCCP Simulator

Increased Reflection of Insolation by Snow

Effects on Land Surface Temperatures

CLM2.2   ANN   CLM2

cam202clm226compnw (yrs 1984-2000)   cam202clm212 (yrs 1984-2000)

MIN = 2.2600e+02 MAX = 3.0258e+02   MIN = 2.2697e+02 MAX = 3.0306e+02

cam202clm226compnw-cam202clm212   T-test of the two means at each grid point

Colored cells are significant at the 0.05 level

MIN = -6.9830e+00 MAX = 1.6192e+00
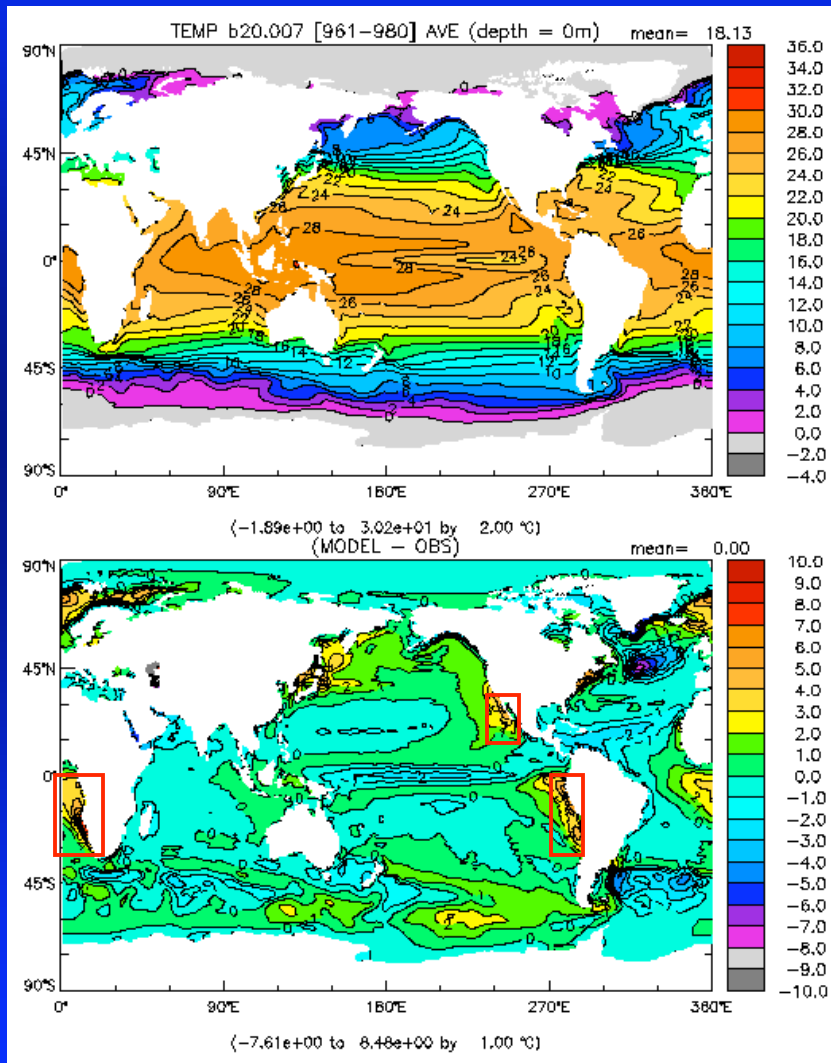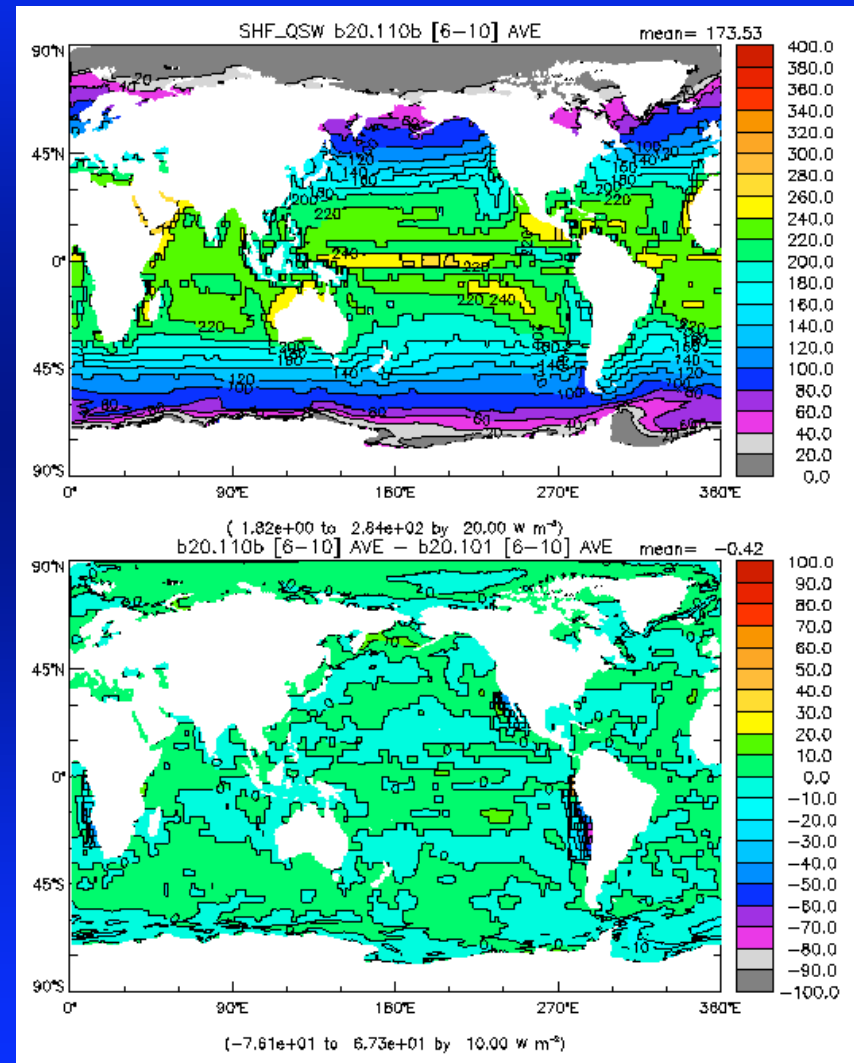
- 22-year (1979-2000) simulations of CAM2 with CLM2.2
- CLM2.2 significantly cools surface air temperature

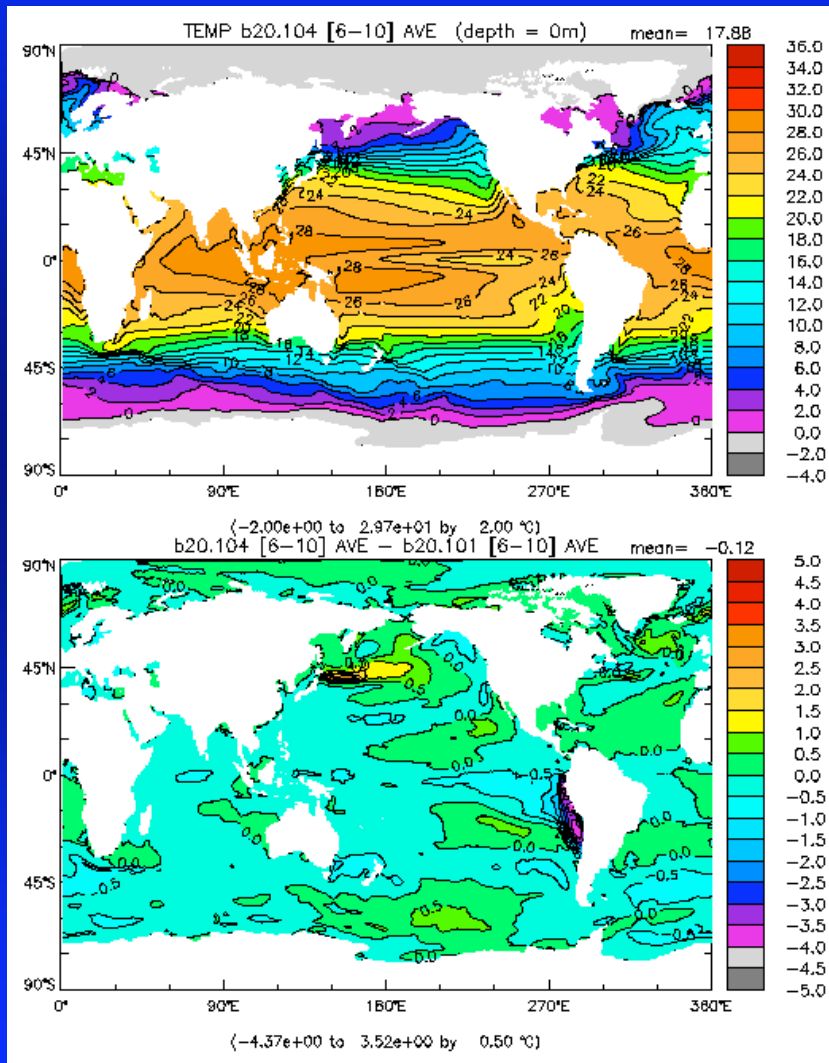# Biases in Coastal Regions

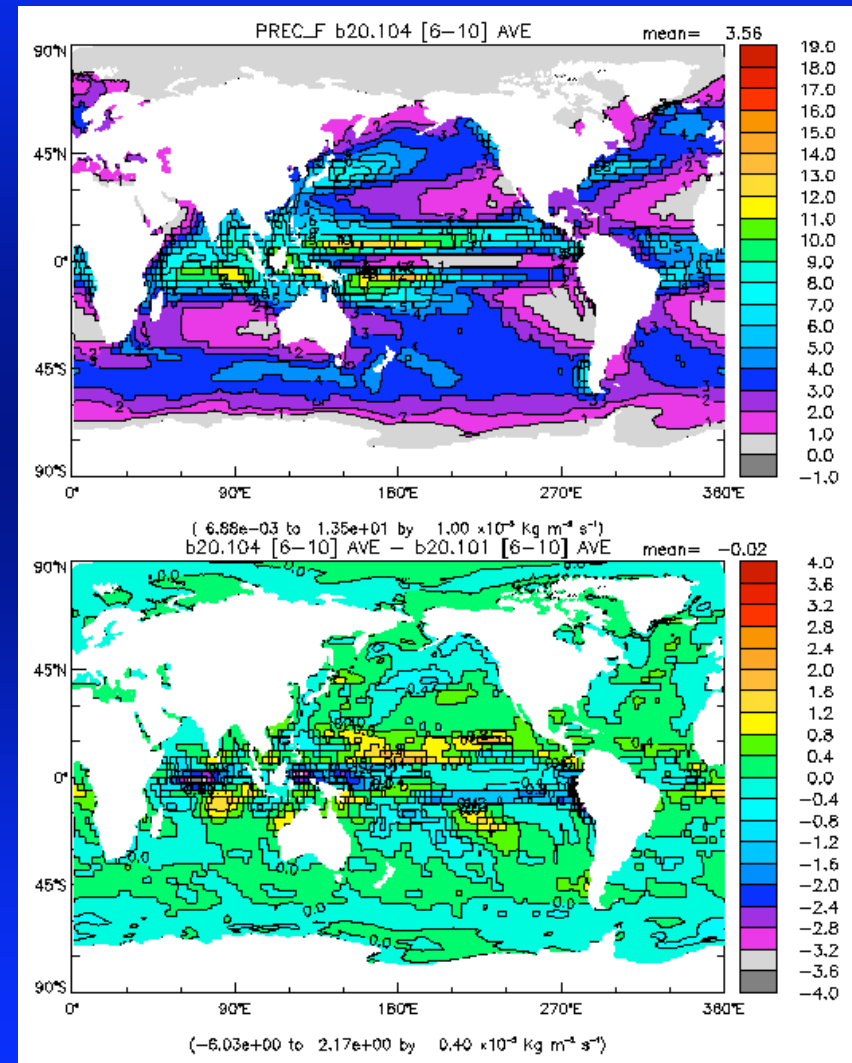CCSM SST (Y961-980 mean)

SWNET heat flux

Specified SST: West coast of S. America
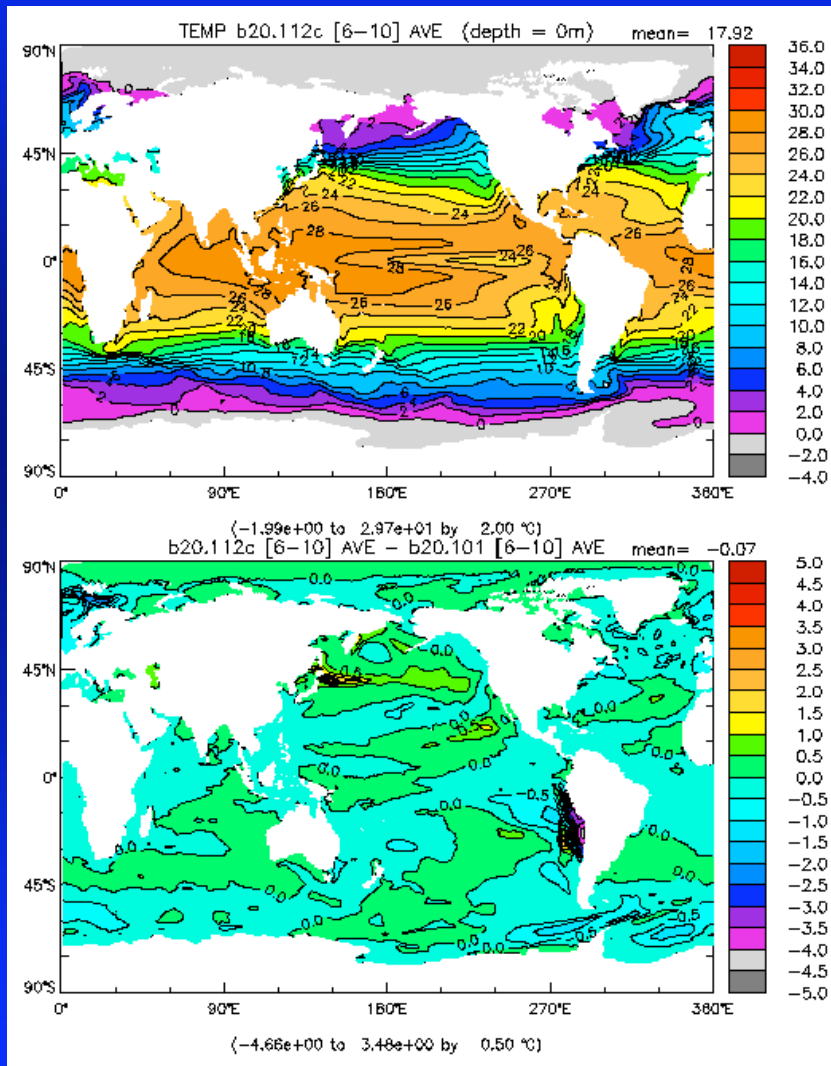
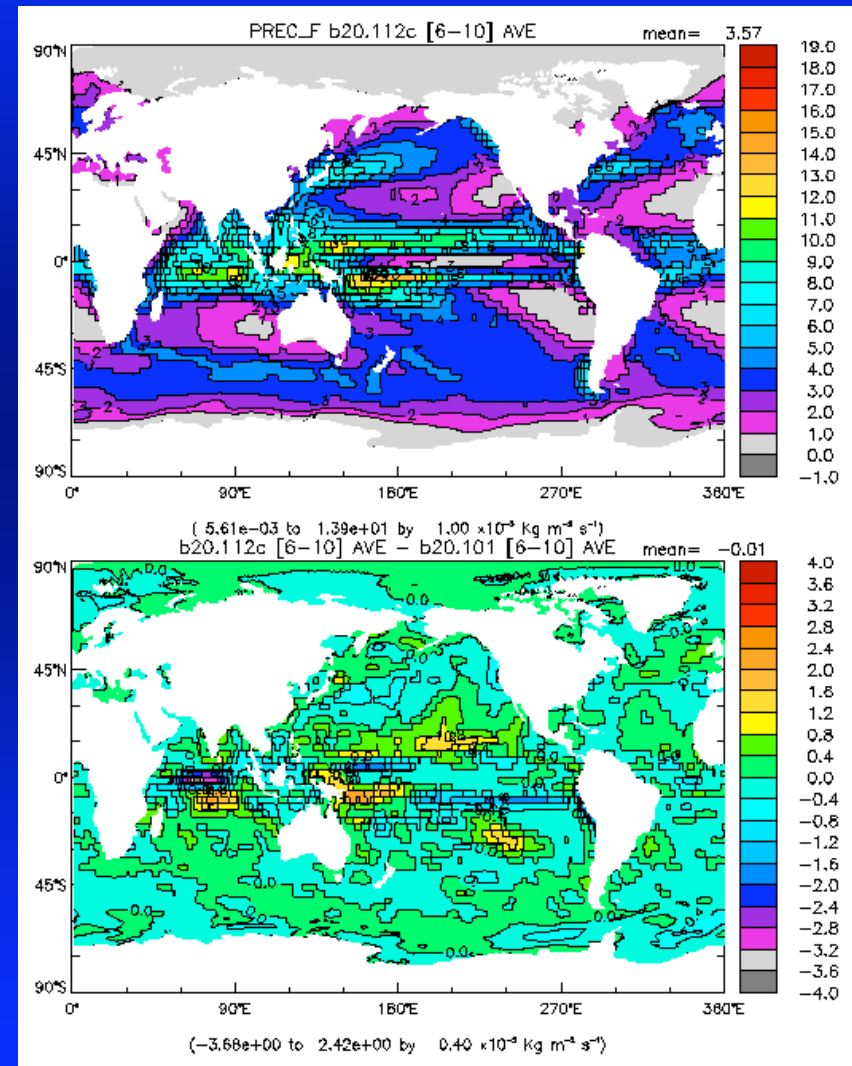## Change in SST

Change in Precipitation

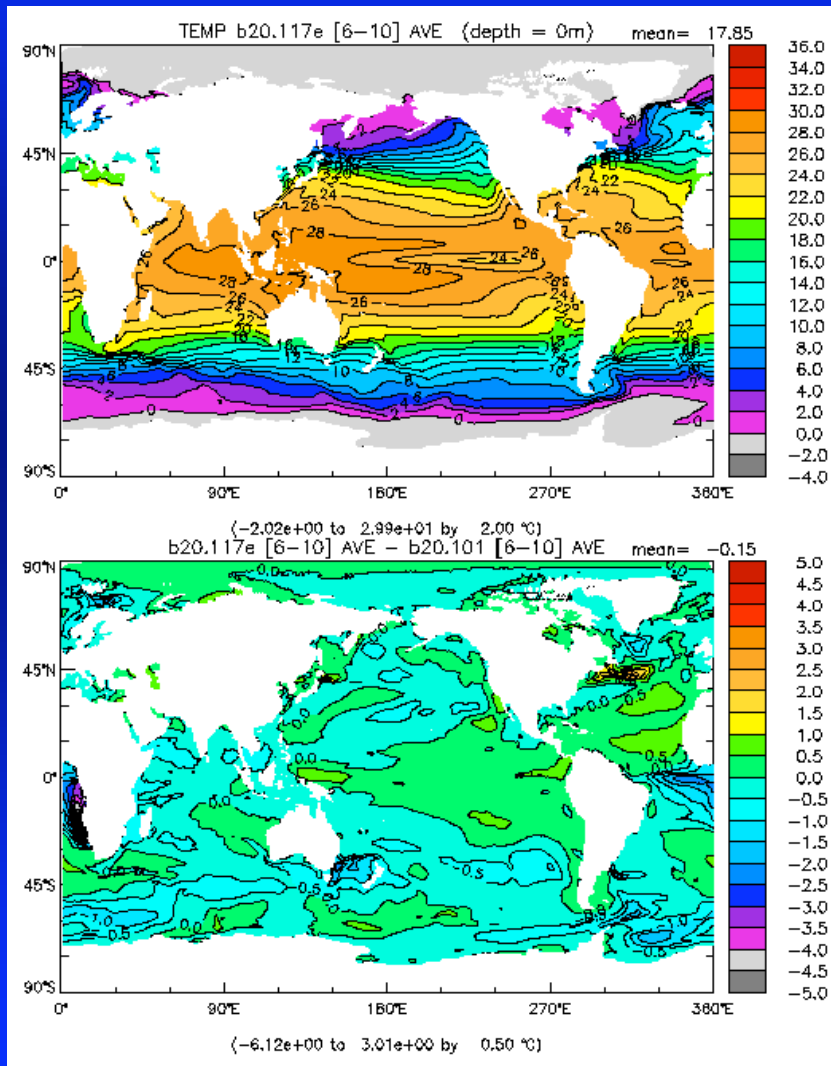# Specified SWNET and winds: West coast of S. America
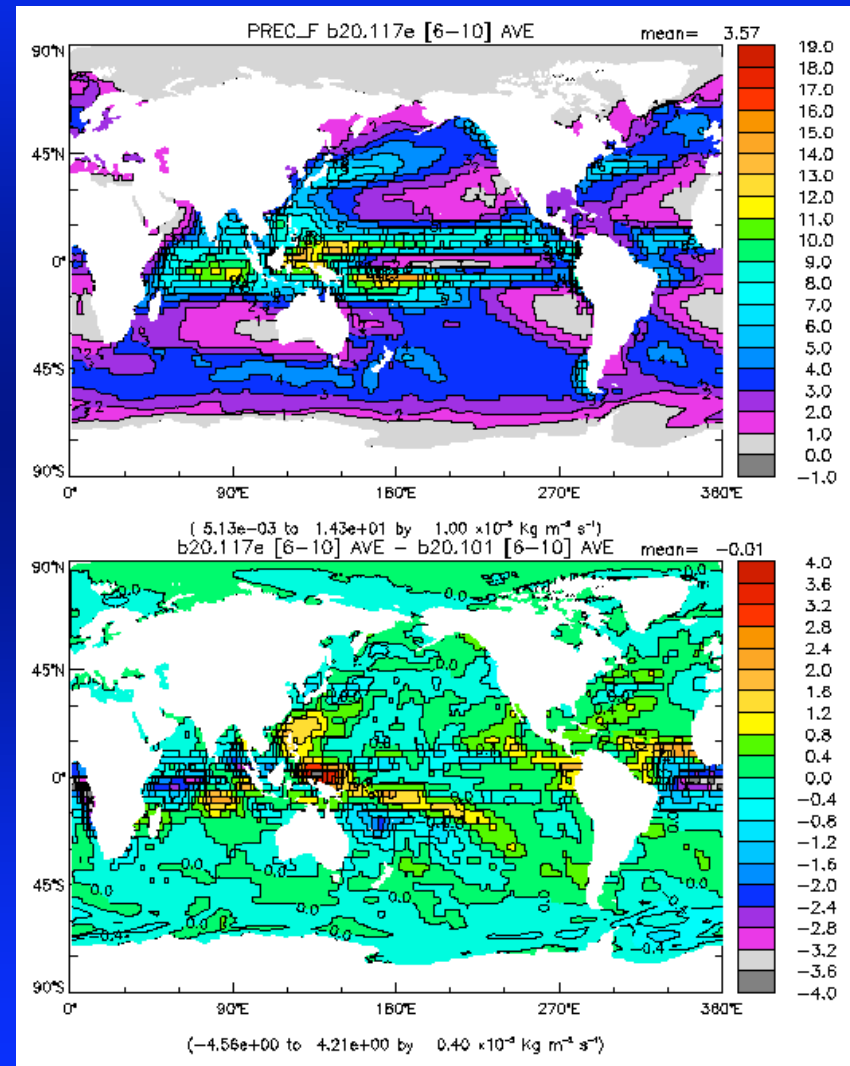
Change in SST

Change in Precipitation

Specified SST: West coast of S. Africa
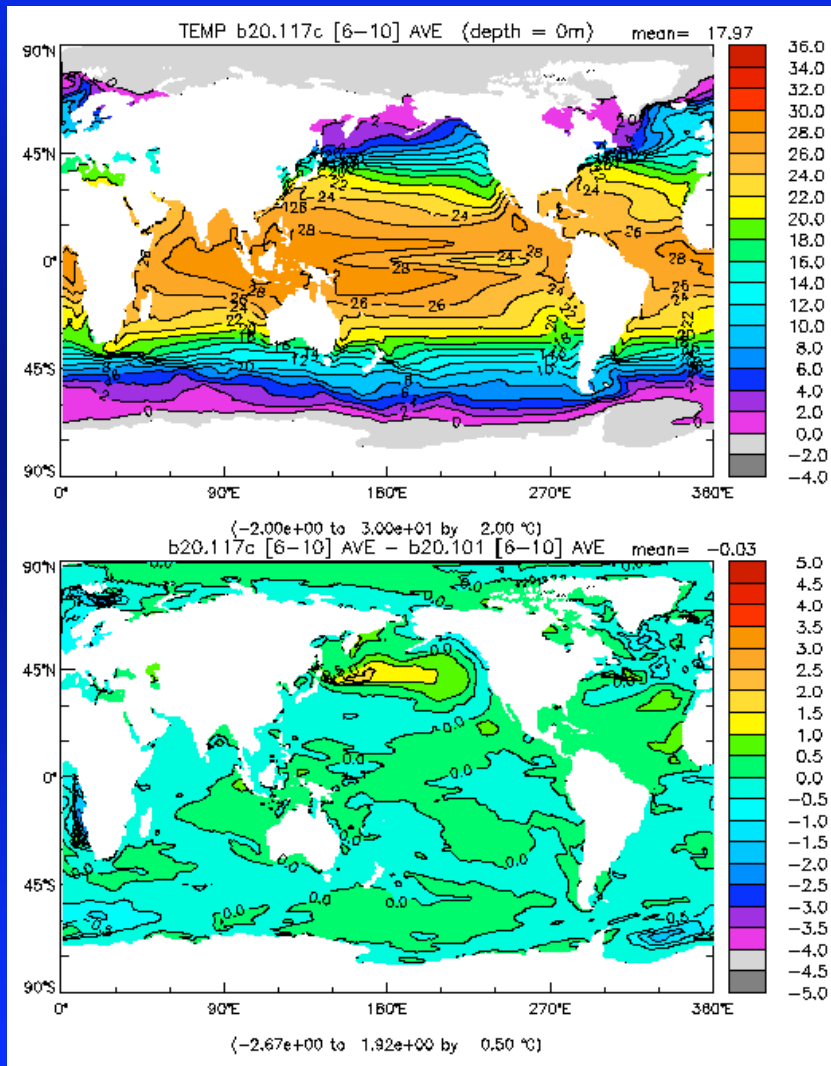
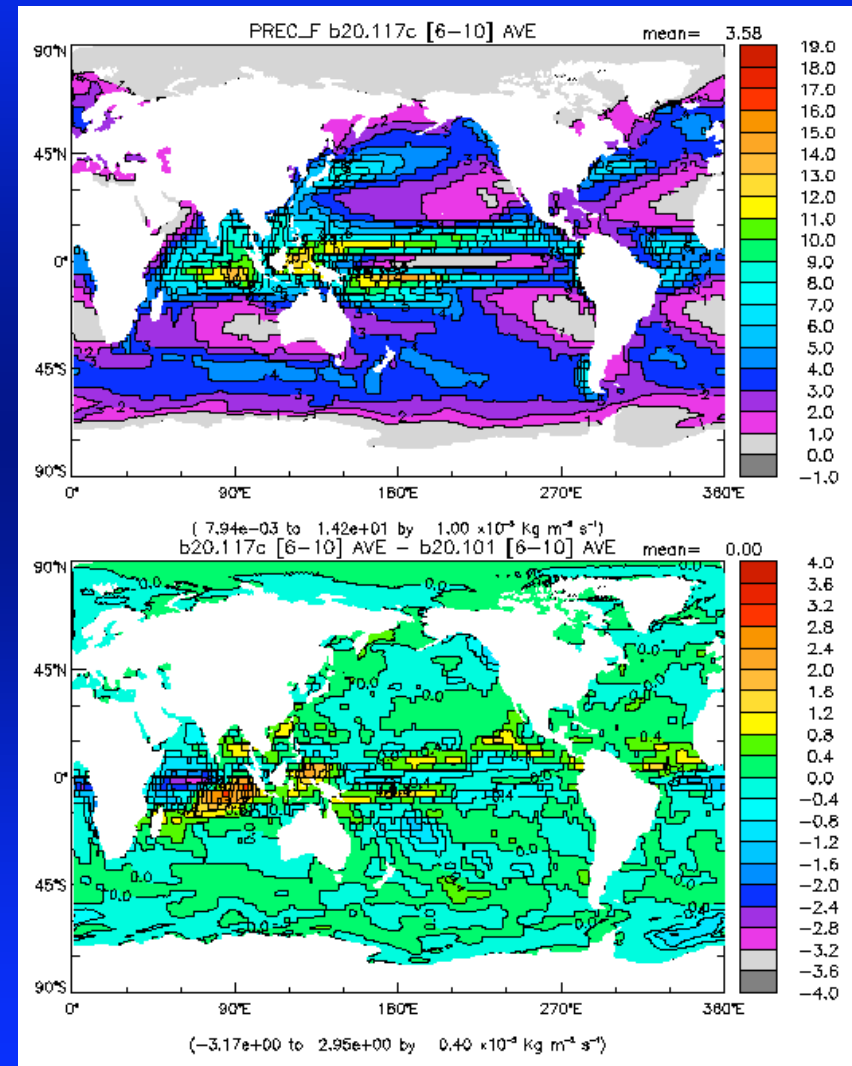## Change in SST

Change in Precipitation

Specified SWNET and winds: West coast of S. Africa

Change in SST

Change in Precipitation

Paths Forward

- Rederivation of implied ocean heat transport
- Interactions with Climate Process Teams:
  - Ocean CPT
  - Atmosphere CPT