Future priorities:

Salinity/water mass contribution to impact of altimetry on seasonal forecasts

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JCSDA 5th Workshop on Satellite Data Assimilation

- GODAS T/S properties to TAO Observations
- Accomplishments
- Future priorities and plans

Bias correction in GODAS

MOM2 done, code available

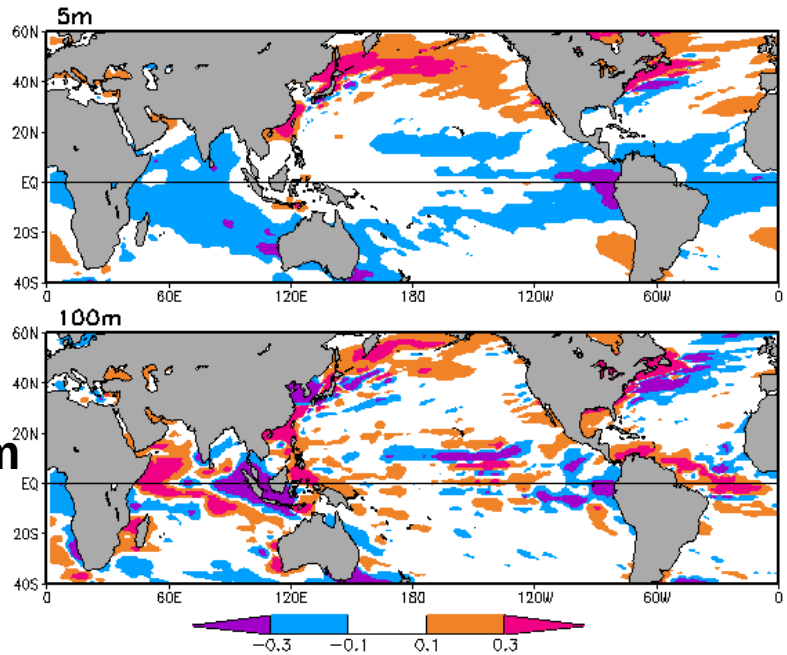
20yr Mean GODAS Temp Bias

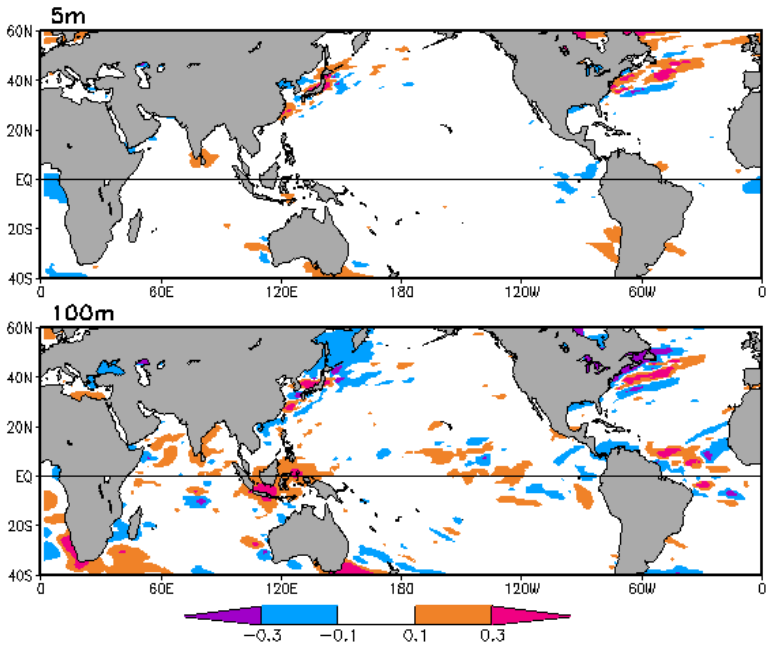
Temp Bias with bias correction

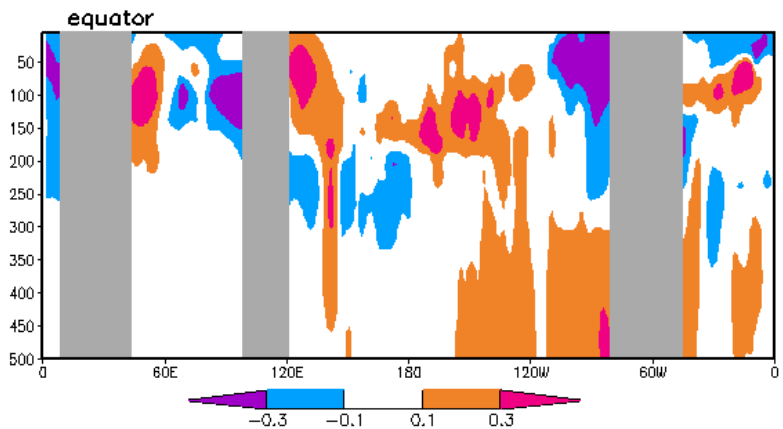
5m

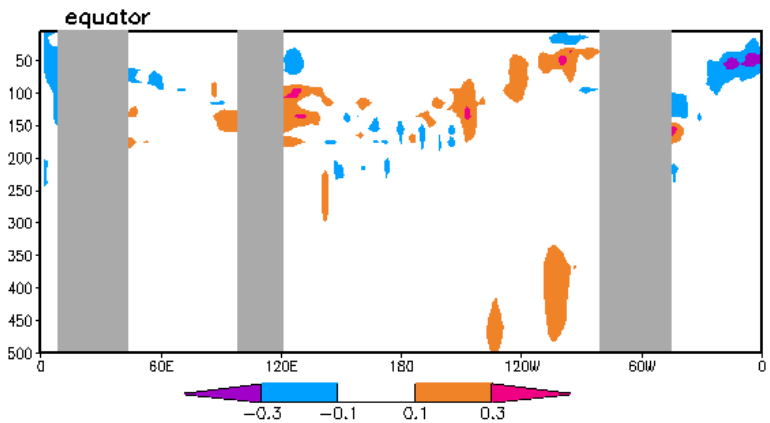
100m

0ºN



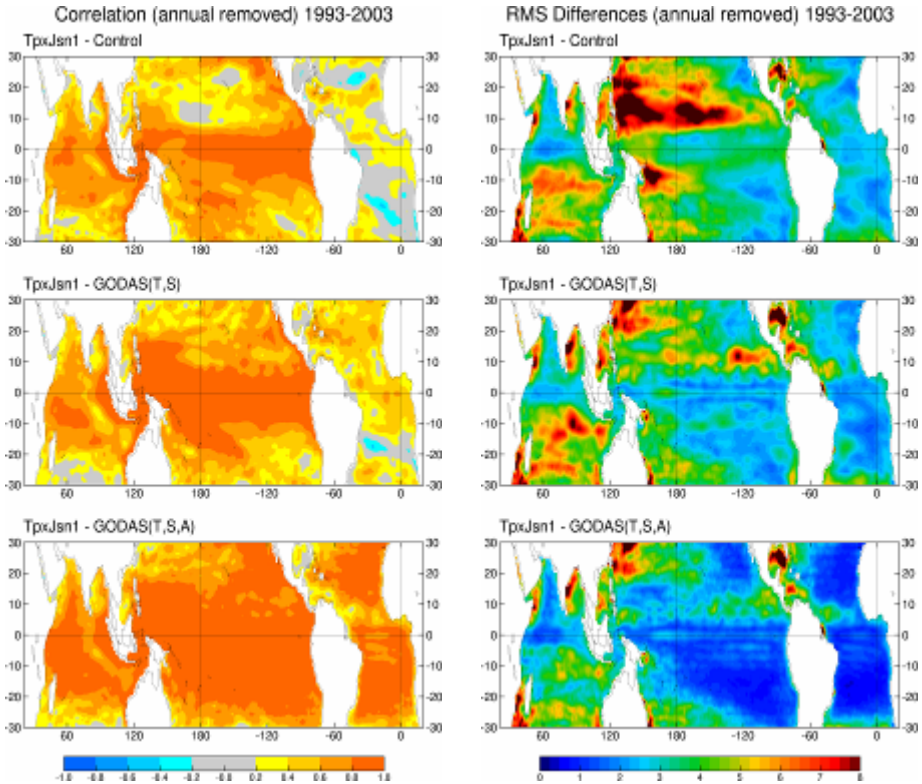






Dave's picture from GODAS: impact of altimeter assimilation

Add altimetry

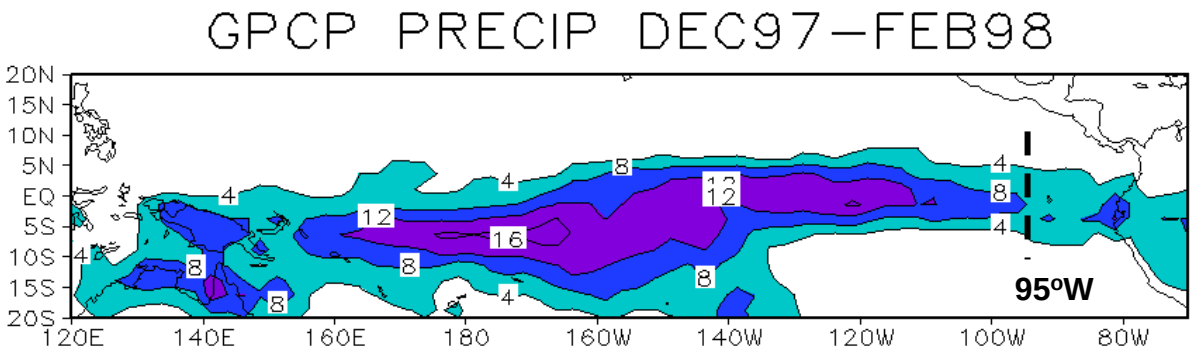


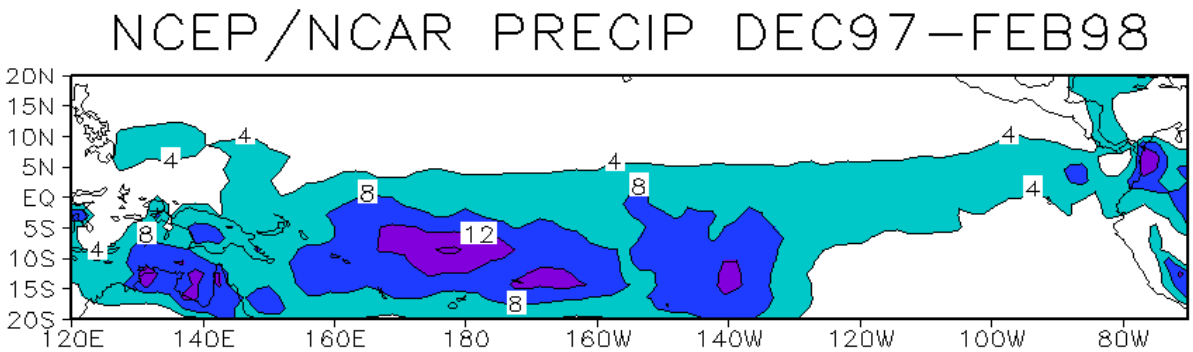
← I'll look at this analysis

Figure 1. Correlation and RMS differences between model and TOPEX/Jason-1 SSH anomalies. Top to bottom: the control, the standard GODAS, the GODAS assimilation of TPX/Jsn-1.

But, the forecasts show more limited improvement. How come?

Uncertainties in surface forcing





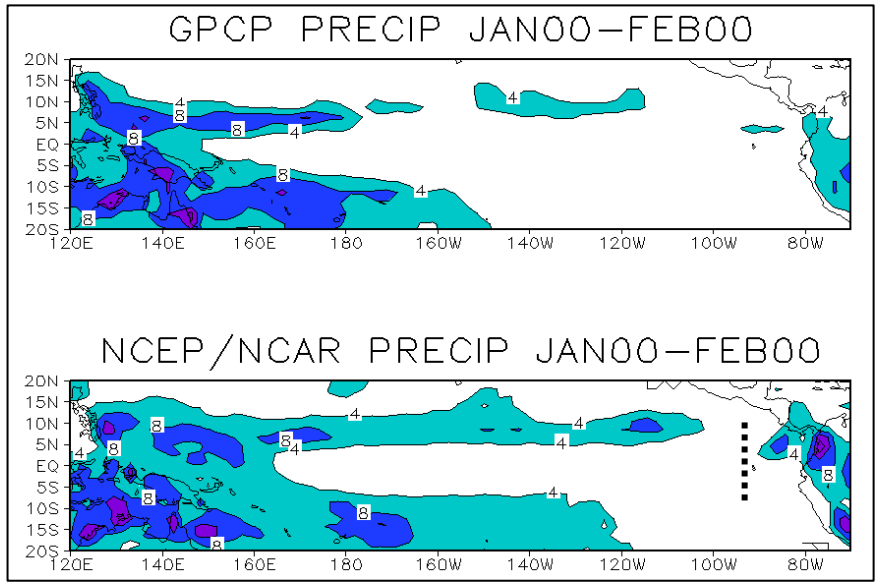
mm/dy

Uncertainties in model physics

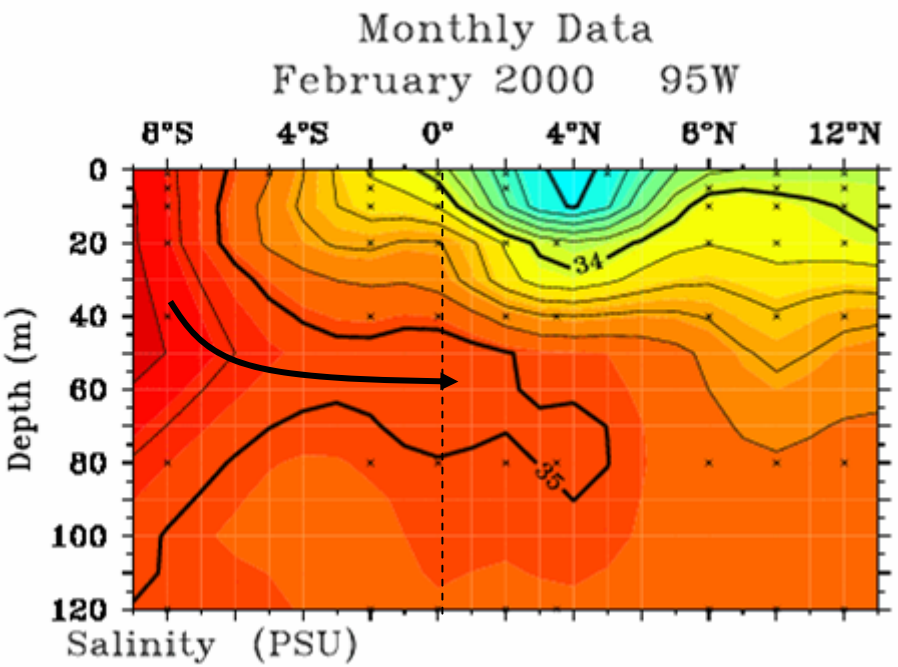
Uncertainties in Temperature-salinity error covariances

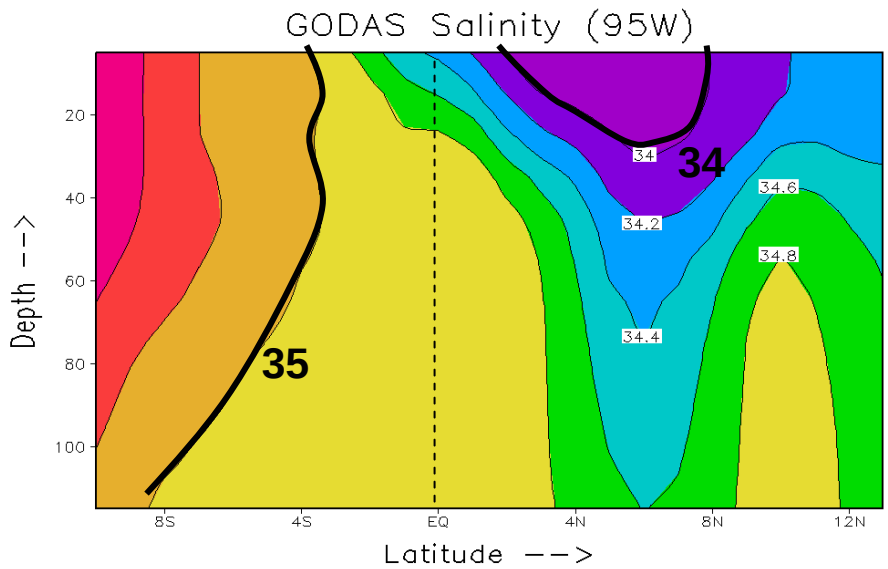
Impact on shallow tropical cells
Salinity sections at 95W

Precipitation



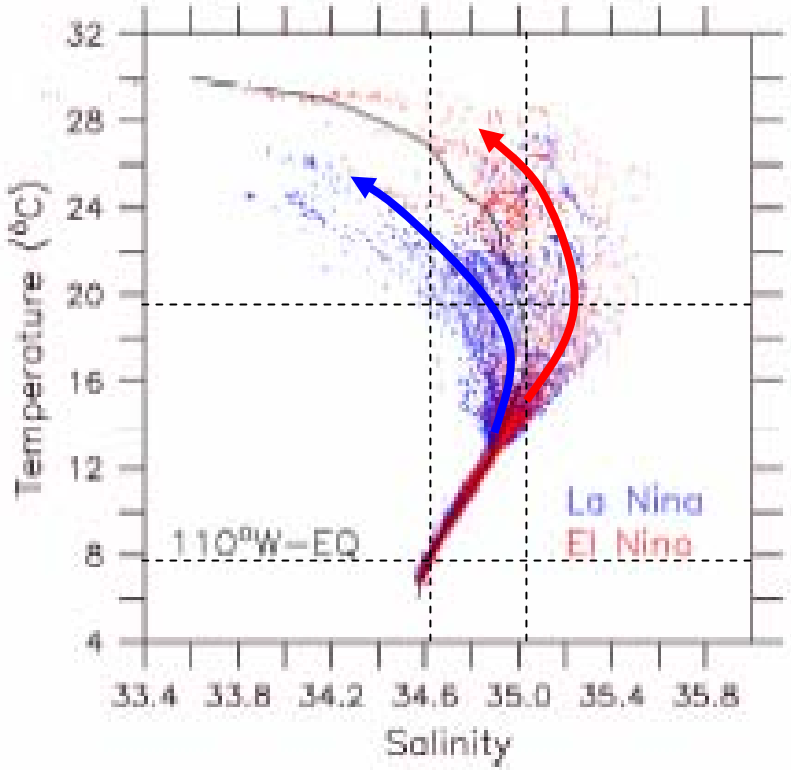
TAO OBS





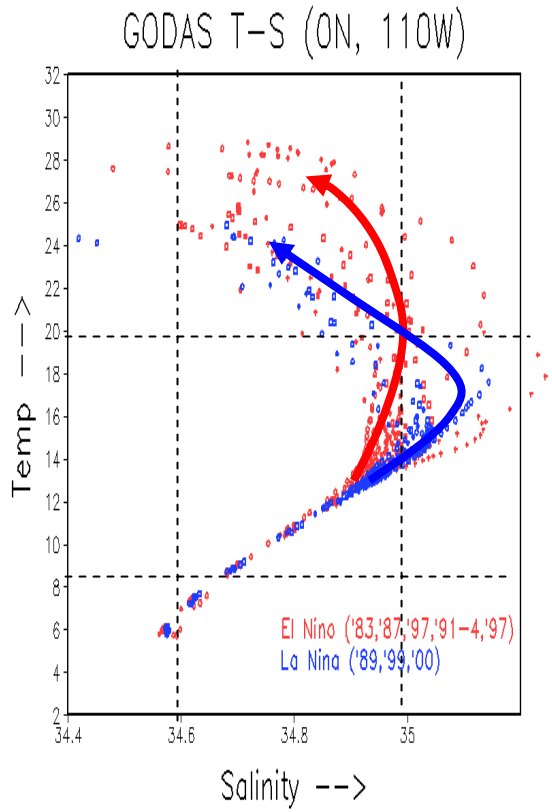
Changes in water masses with ENSO phase

Observations

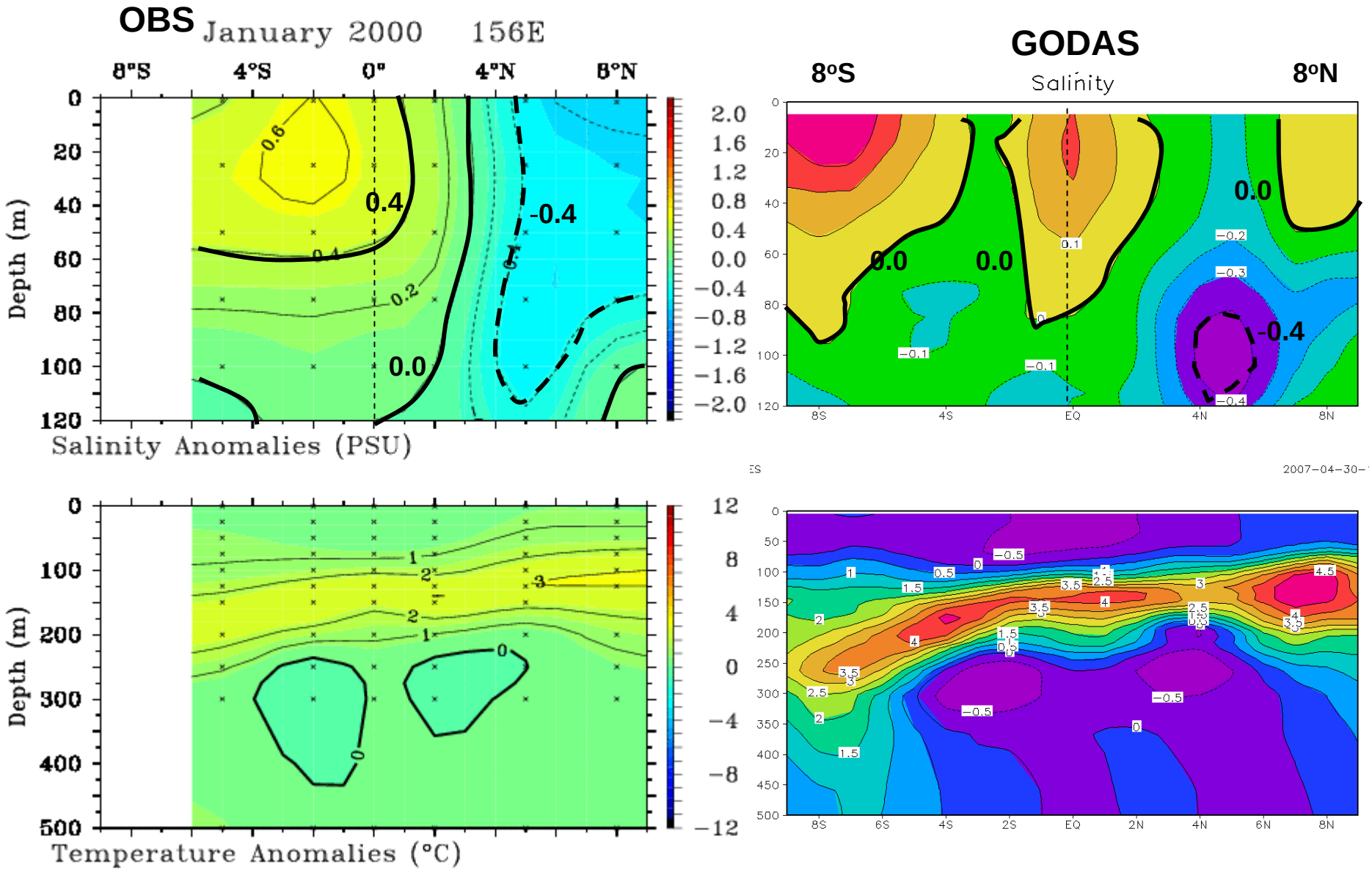


Maes, et al 2001

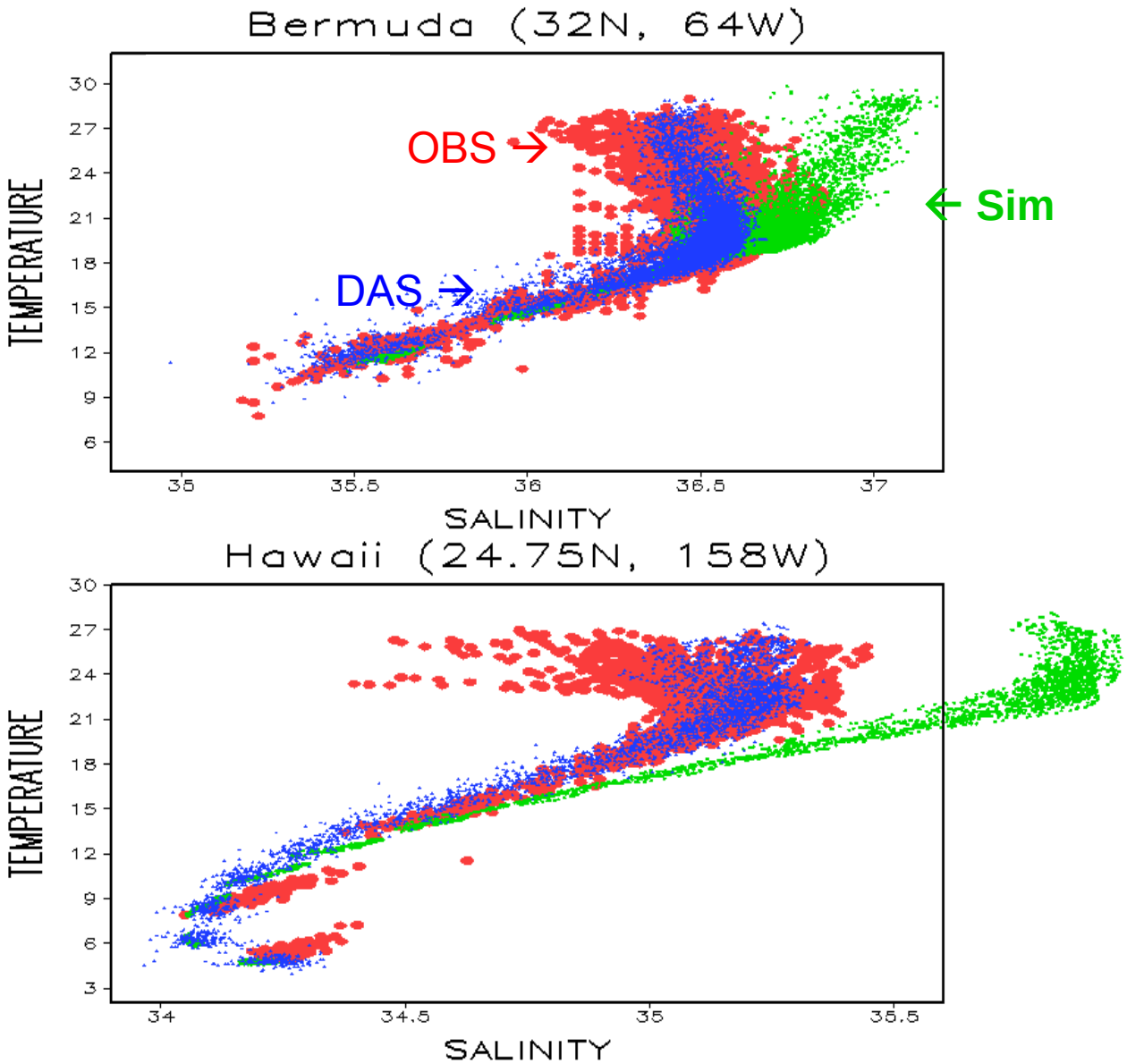
GODAS



Changing temperature-salinity covariances in the western half of the basin (156E)

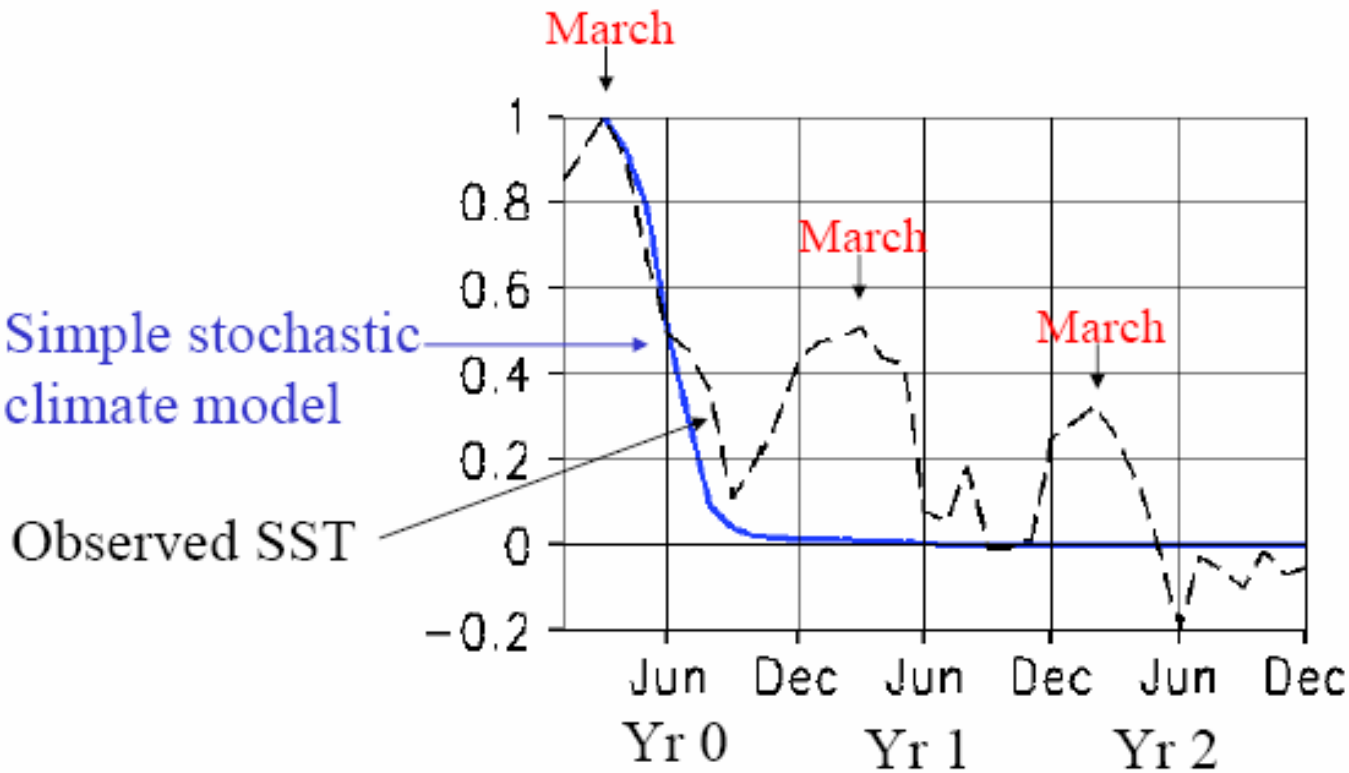


T/S relations in subtropics



SST memory in the North Pacific

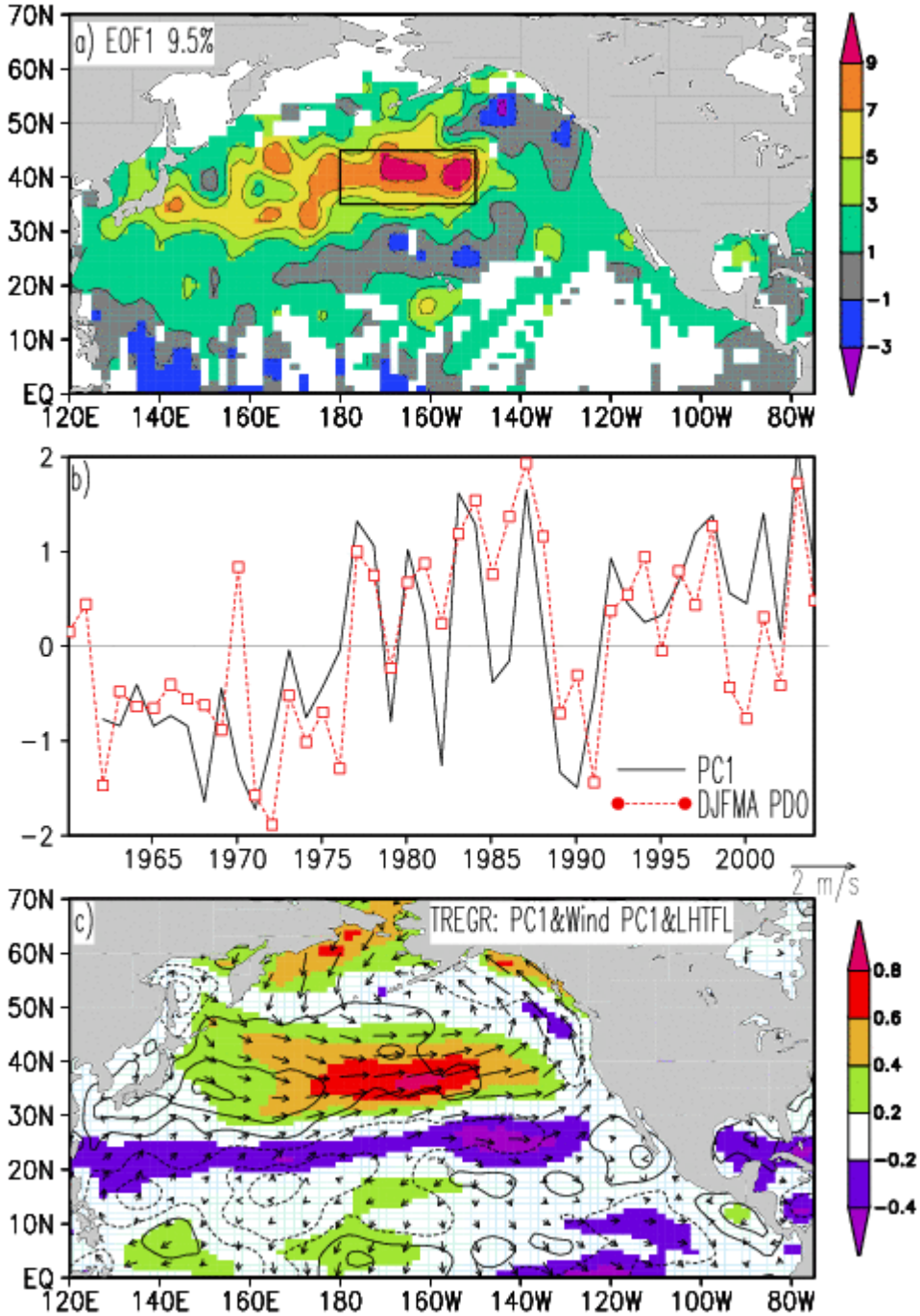
Deser et al. (J. Climate, 2003)



De-correlation time considering all months: ~ 4 months

winter only: ~ 2 years

Winter mixed layer variability patterns



Future Priorities and Plans

- Improve the representation of tropical water masses and the pathways from the subtropics
  - Experiments examining the impact of reducing temperature-salinity error covariances
    - reduce implied entrainment/mixing rates
  - Experiments looking at P-E error
  - Experiments exploring impact of Aquarius/SMOS
- Improve representation of mixed layer/ barrier/compensated layers
  - Improve flux estimates
  - Decouple ΔT and ΔS within the ML

Additional Plans

- Explore GMAO forecast impact of SSH for improvements to S(z), MLT
- Engage GFDL. What can be done together?