

The Global Ocean Data Assimilation System (GODAS) at NCEP

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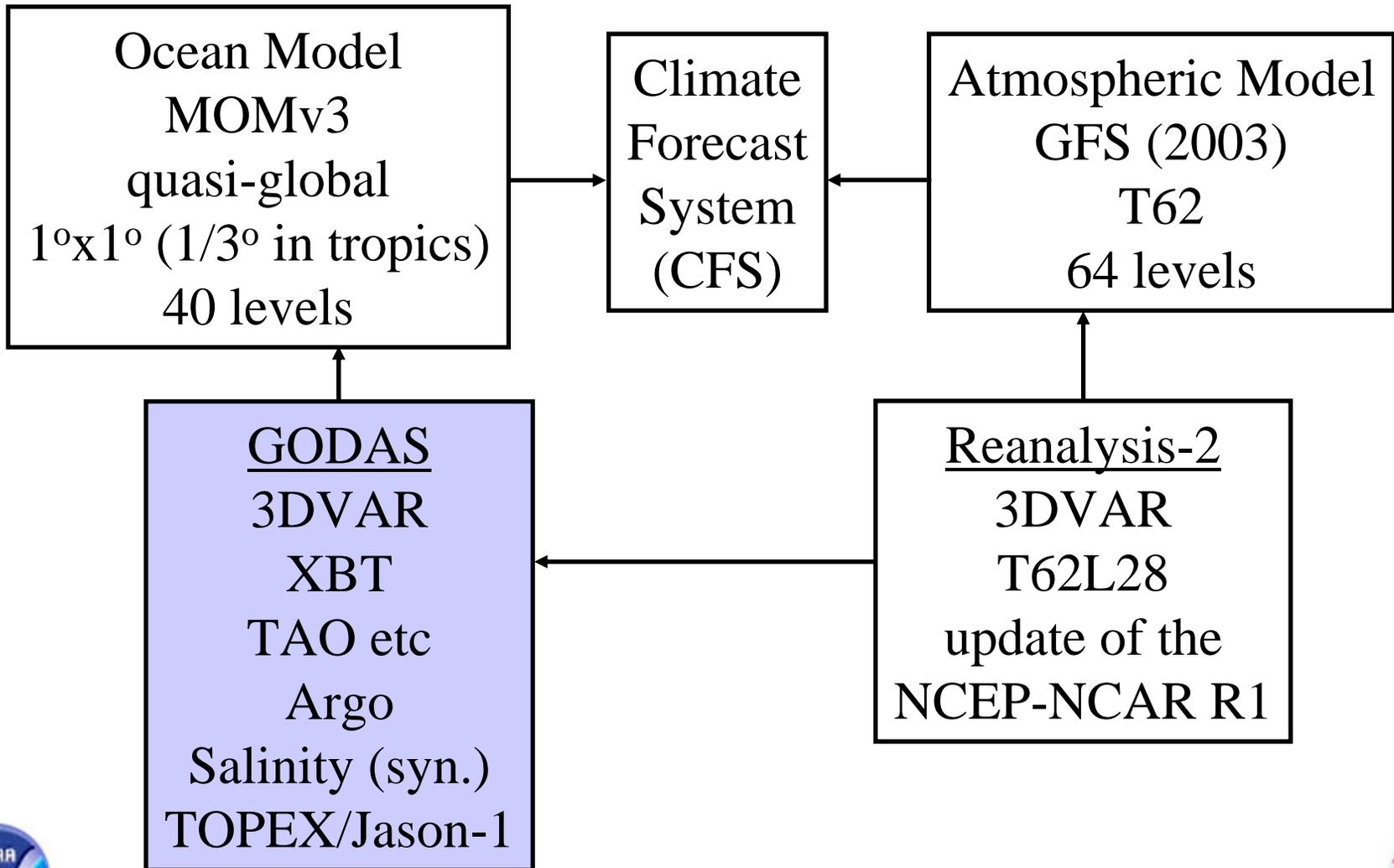


Content

- The impact of satellite altimetry data on GODAS
- The impact of Argo profile data on GODAS

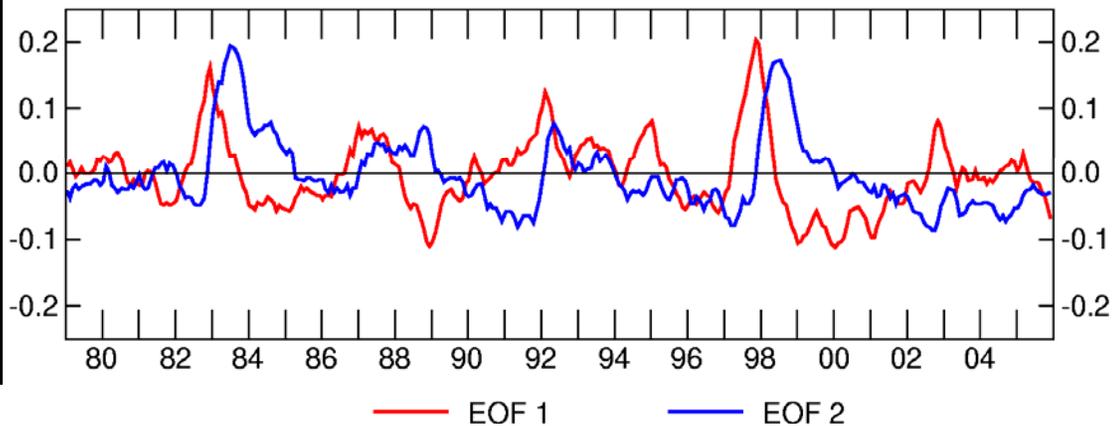
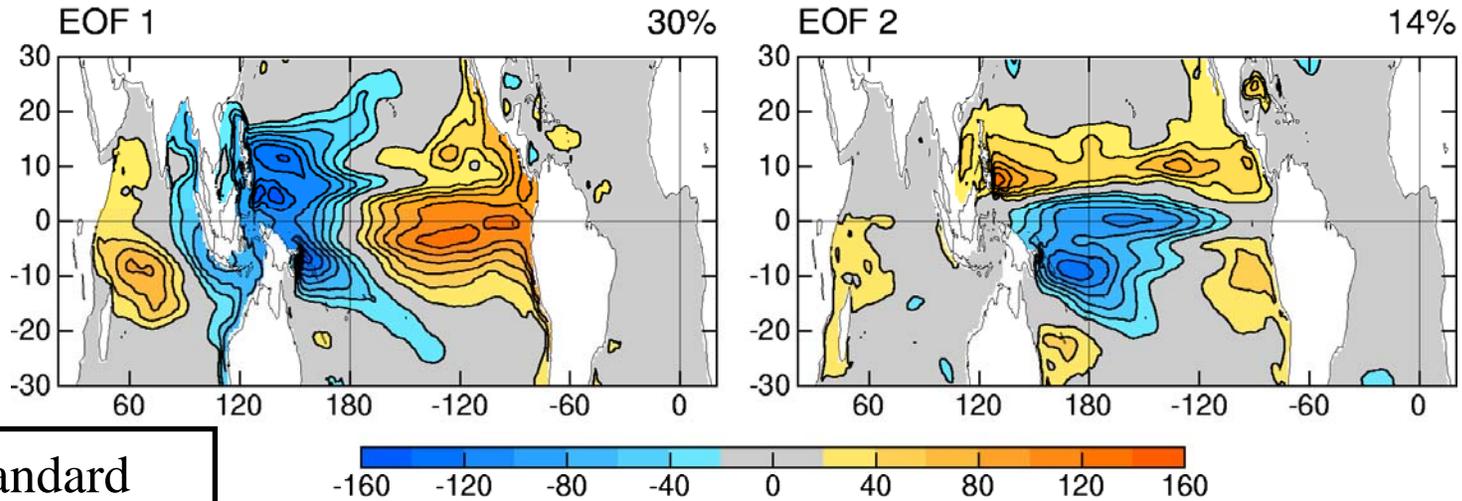


Seasonal to Interannual Prediction at NCEP



Operational GODAS performance

GODAS Sea Surface Height (1979-2005)



The standard GODAS reproduces the interannual variability well, notably the El Nino / La Nina signal.



Original vs. Altimetry assimilation

Two experiments (1993-2005)

Original operational GODAS

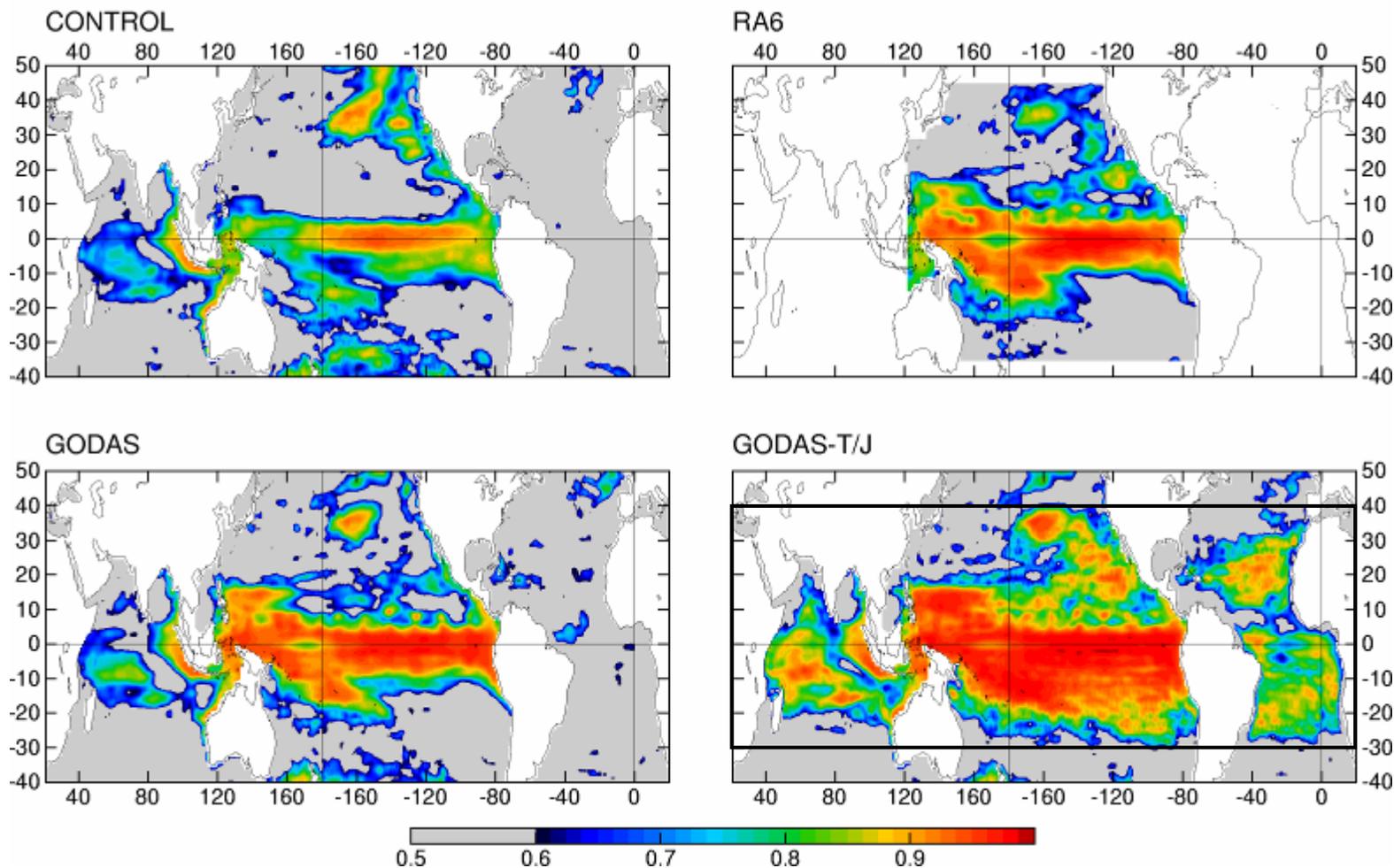
- Temperature profiles from Argo, XBTs, TAO moorings
- Depth of assimilation is 750 m.

Altimetry assimilation GODAS-T/J

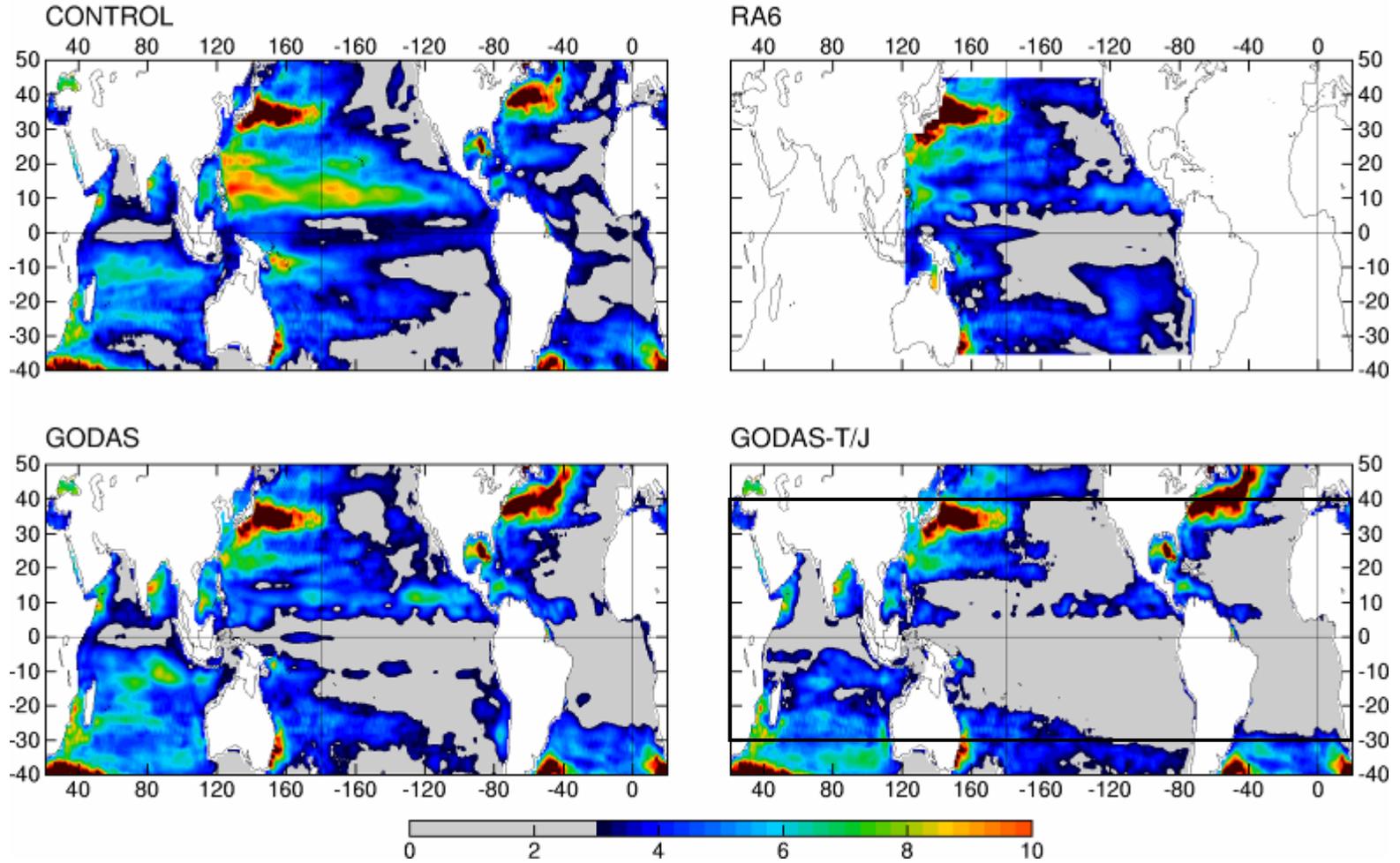
- Temperature profiles from Argo, XBTs, TAO moorings
- Altimetry from TOPEX and Jason-1
- Depth of assimilation is 750 m. SSH innovations contribute to temperature and salinity corrections.



Correlation w. TPX/Jsn1 1993-2005



RMS Difference w. TPX/Jsn1 1993-2005



Assimilating Argo Salinity

Two 2005 experiments

Original operational GODAS

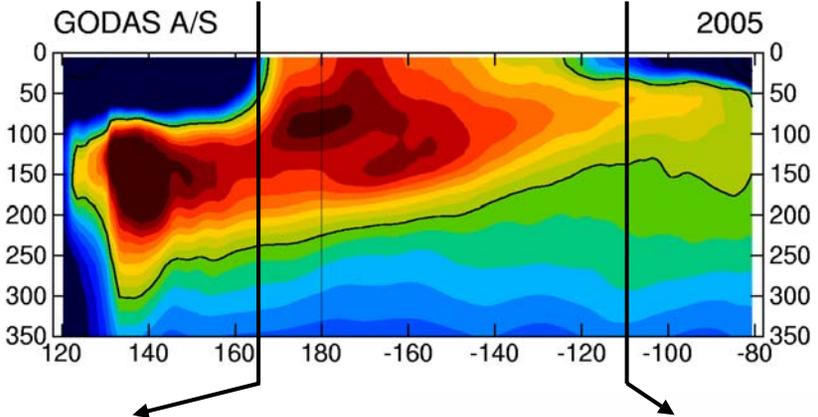
- Temperature profiles from Argo, XBTs, TAO moorings
- Salinity profiles are **100% synthetic** (via TS-relationship)

Argo salinity in GODAS-A/S

- Temperature profiles from Argo and XBTs only
- Salinity profiles are **75% observed** (Argo) and **25% synthetic** (XBTs)

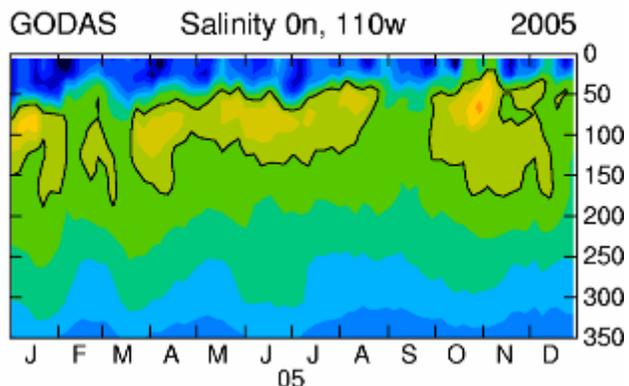
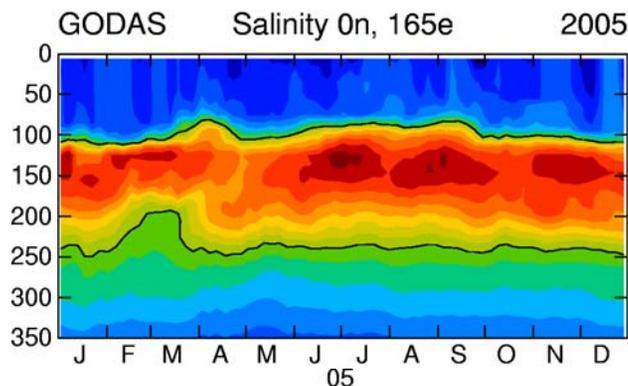


Assimilating Argo Salinity

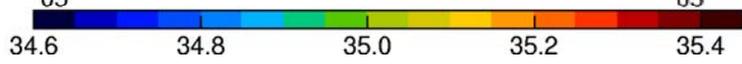
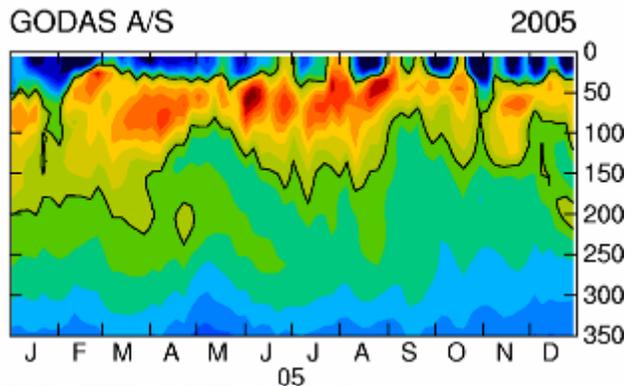
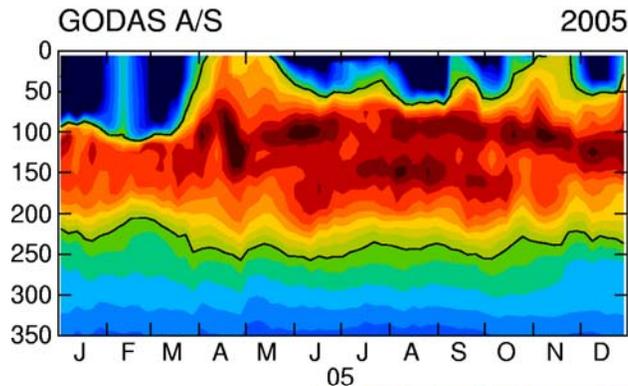


Equatorial salinity section in the Pacific (vertical bars show positions of time-series below).

GODAS
Salinity variability due to correlation with temperature.



GODAS-A/S
Salinity variability introduced by observations.

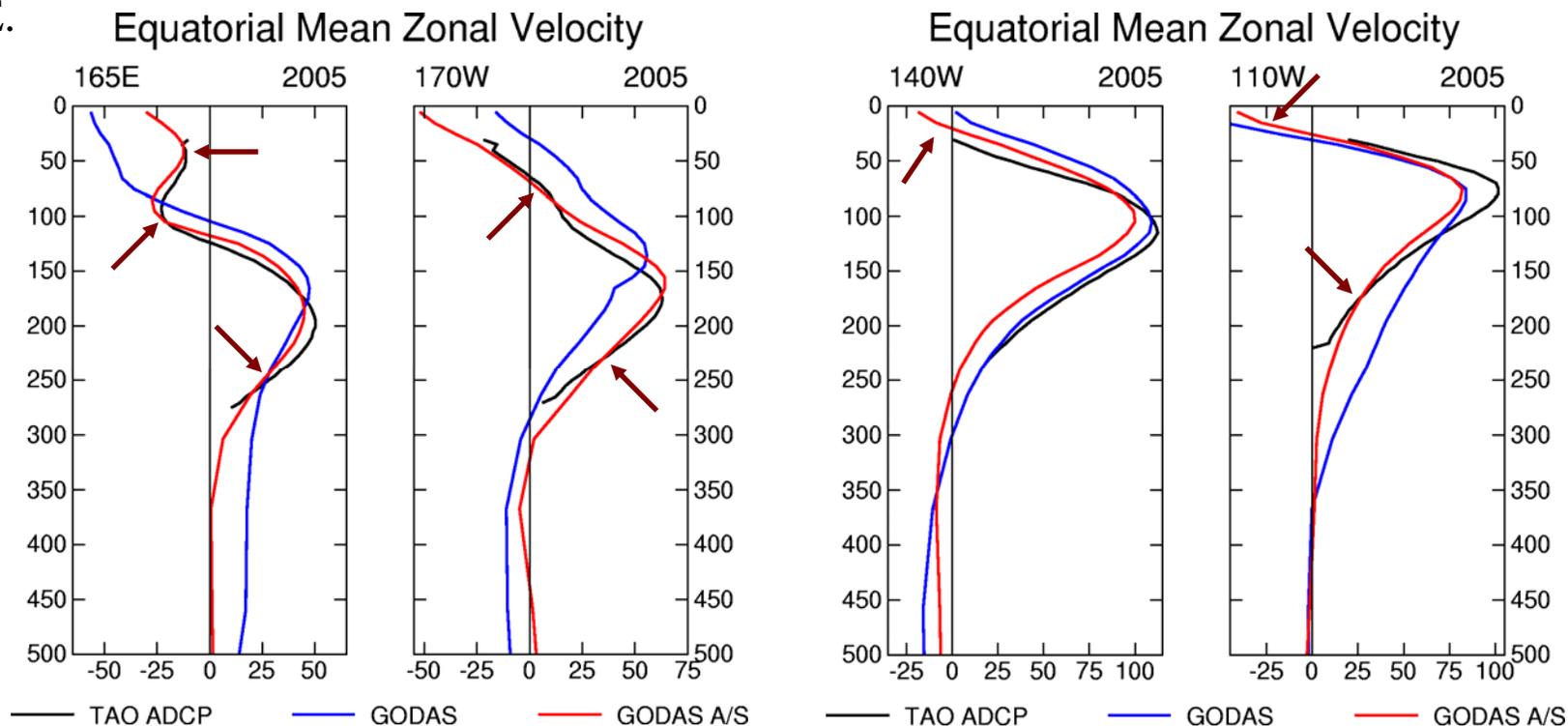


In the west, assimilating Argo salinity corrects the bias at the surface and the depth of the undercurrent core and captures the complex structure at 165°E.

Assimilating Argo Salinity

Comparison with independent ADCP currents.

In the east, assimilating Argo salinity reduces the bias at the surface and sharpens the profile below the thermocline at 110°W.



ADCP

GODAS

GODAS-A/S



Summary / Challenges

- The assimilation of TOPEX/Jason-1 significantly improves the SSH in GODAS.
However, we haven't yet demonstrated an improvement in SI forecasts with the addition of these data.
- The assimilation of Argo salinity dramatically improves Pacific equatorial currents, demonstrating the importance of tropical salinity.
However, to take advantage of this result we will need to find a better way to “salt” other temperature profiles (XBTs, TAO, etc).

