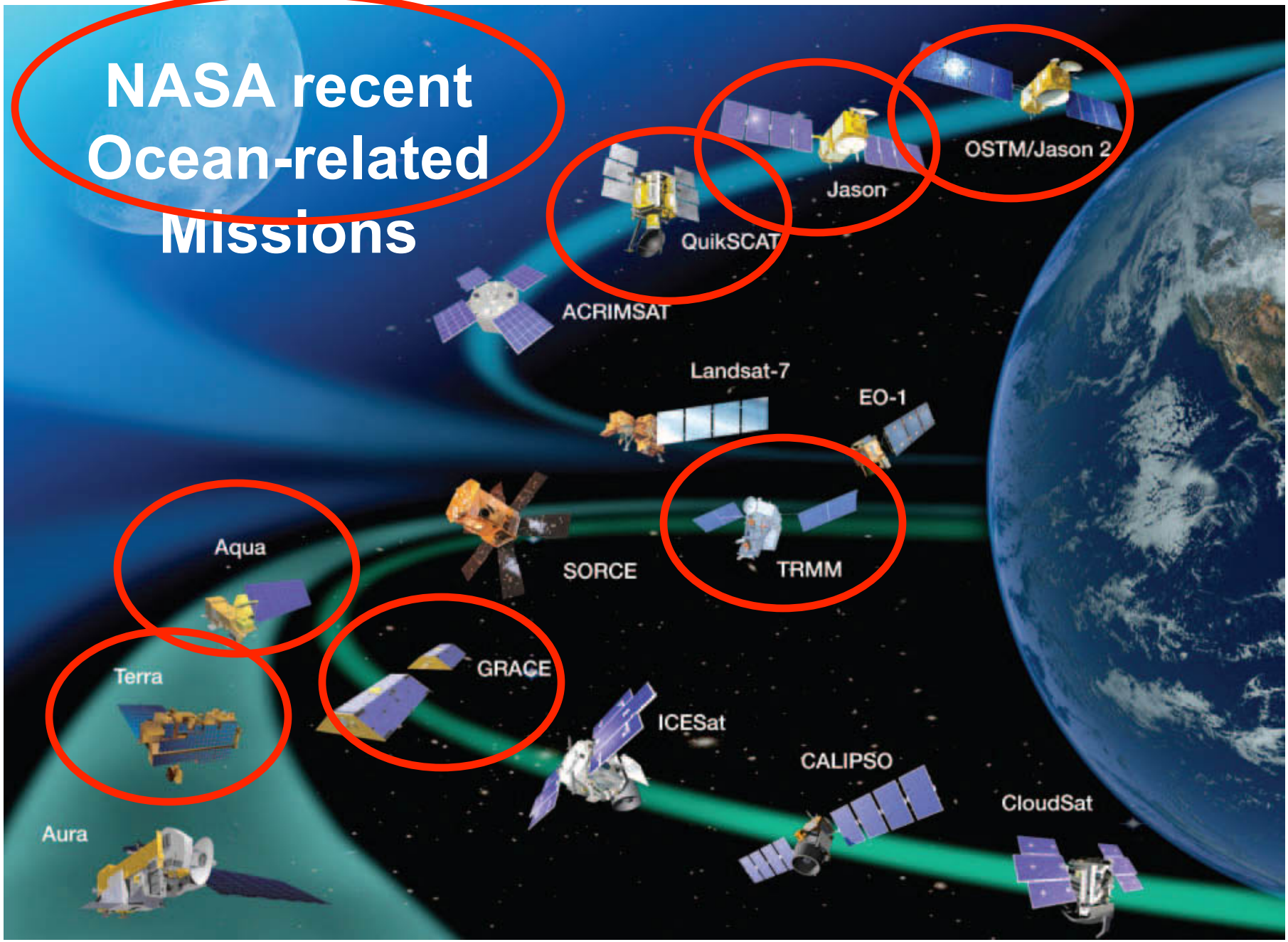
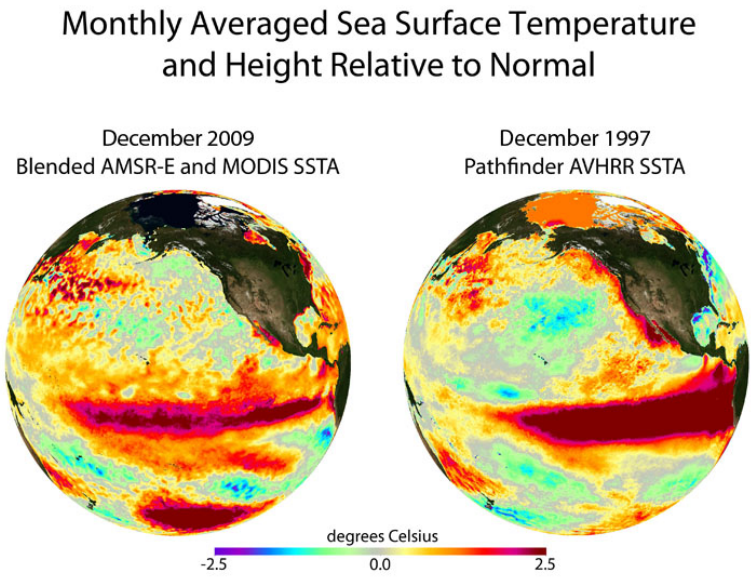
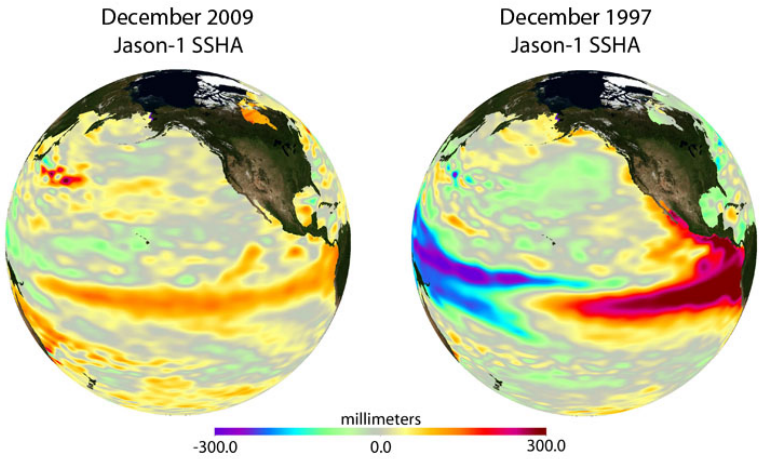

NASA recent Ocean-related Missions
OSTM/Jason 2
Jason
QuikSCAT
ACRIMSAT
Landsat-7
EO-1
Aqua
SORCE
TRMM
Terra
GRACE
ICESat
CALIPSO
CloudSat
Aura

Like TAO, satellite observations are important to monitoring, understanding, & predicting ENSO

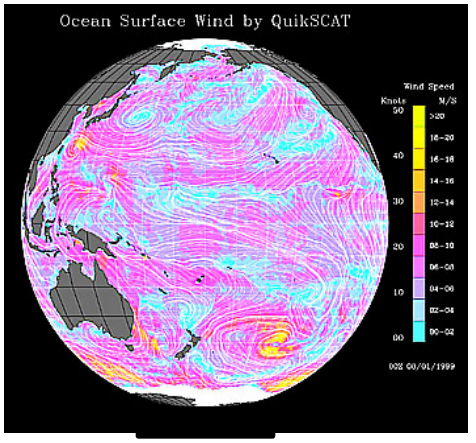
SST



SSH



Vector wind



Complementarity of satellite & TAO measurements on ENSO analysis and forecast

TAO and satellites have been shown to both improve ocean analysis (e.g., Segscheider et al. 2001, Vidard et a. 2009) and seasonal forecast (Fujii et al. 2008, Balmaseda and Anderson 2009).

- TAO data provide information about upper-ocean thermal structure, currents, and surface meteorology at mooring locations.

- Satellites provide information about SST, pycnocline fluctuations (through sea level variations), and wind stress, with near-uniform spatial & temporal sampling.

- TAO and satellite altimetry together allow an inference of salinity effect.

- Any redundancy in existing observing systems (if any) can ensure the robustness of the systems as a whole (e.g., in case of the loss of a satellite or natural event [solar flare, volcano]).

What is at risk from loss of part of TAO array?

- Reduces the capability to monitor and understand the elusive and evolving El Nino (e.g., more frequent occurrence of central-Pacific than eastern-Pacific El Nino since the 1990s indicate a need to maintain the current TAO mooring density).

- Slows down the progress in solving many lingering problems in ENSO analysis and forecast systems (e.g., model deficiency and assimilation).

- Forecast sensitivity: ENSO forecast are known to be sensitive to the initial conditions; any degradation of the estimated initial conditions due to a reduction in the capability of the observing system (e.g., TAO) could affect ENSO forecast significantly, with important consequences.