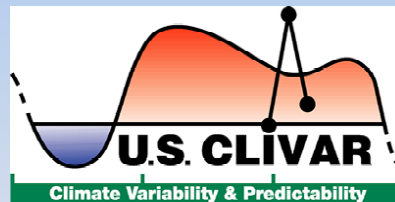


CLIVAR and the Role of High Quality Surface Meteorology Observations

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CLIVAR

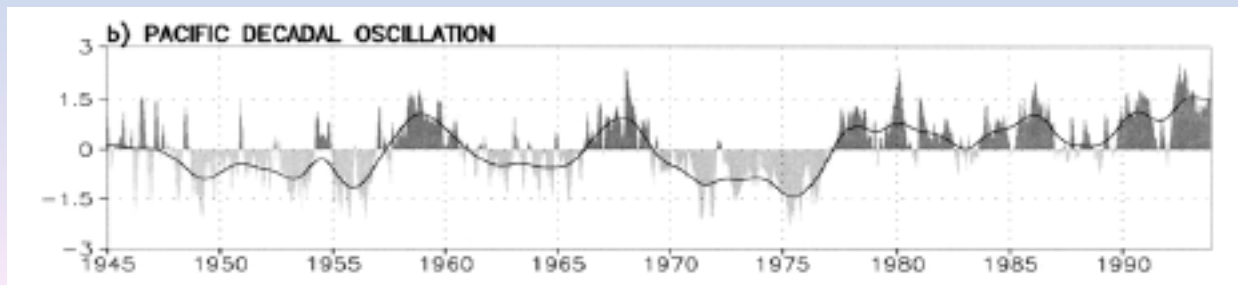
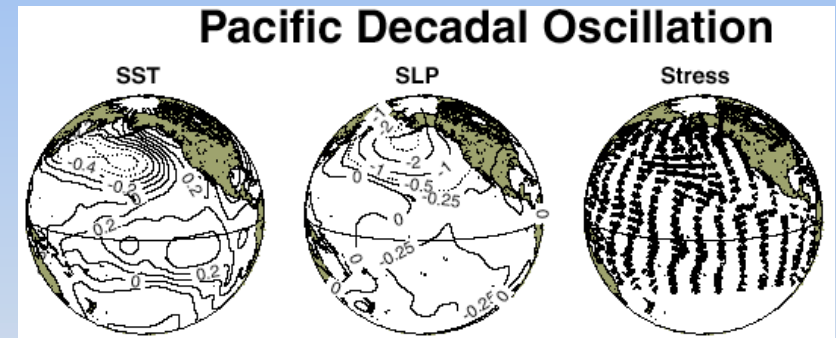
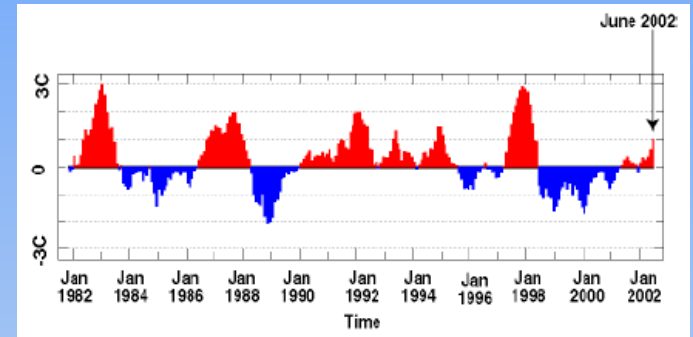
Climate Variability and Predictability

- What causes the variability of the earth's climate on time scales from seasons to centuries and can we predict it?
- Can we distinguish natural from anthropogenic induced variability?
- Science Plan - 1995
- U.S. CLIVAR SSC formed - Summer 1998
- International CLIVAR Conference - December 1998



Pacific Decadal Variability

- ENSO and its decadal modulation
 - Ocean and/or atmospheric mechanisms that link to mid-latitudes?
 - ENSO dynamics - processes that govern storage and vertical/horizontal transports and upper-ocean mixing.
 - Improving S-I predictions...
- Decadal variability/PDO
 - Stochastic forcing?
 - Western boundary currents?
 - Tropical basin origins?
 - Decadal feedbacks in the extratropics?



Atlantic Variability

- NAO/AO/AM

- Mechanisms that govern its variability?
- Low-frequency trends?
- Ocean, land, sea-ice feedbacks?

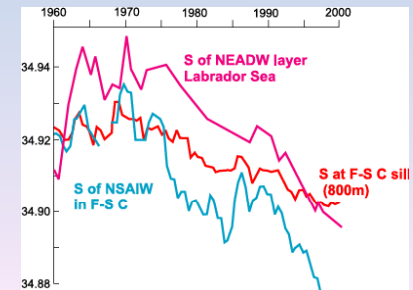
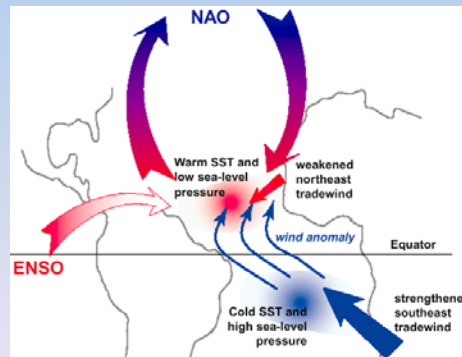
- TAV

- Influence of ENSO, NAO?
- Role of coupling in TNA? Of subtropical cells?

- MOC

- Variability of ocean heat transport?
- Sensitivity to sfc forcing?
- Role of thermohaline circulation in abrupt climate change?

QuickTime™ and a GIF decompressor are needed to see this picture.



Comparisons of global flux products

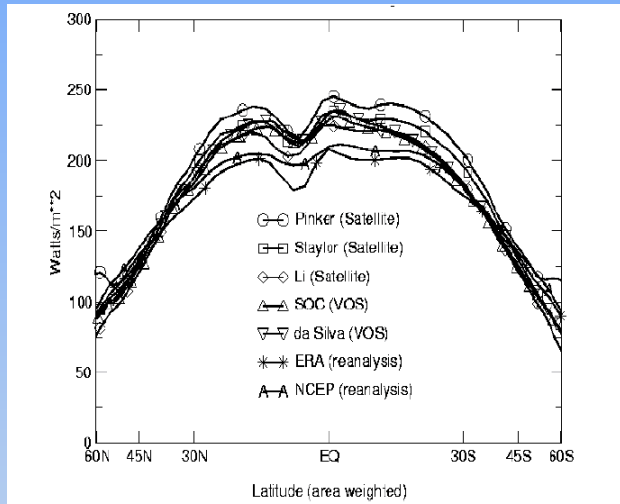


Figure 11.3.5 The climatological zonal mean net surface shortwave radiation from three satellite products, two VOS based products, and two reanalysis products.

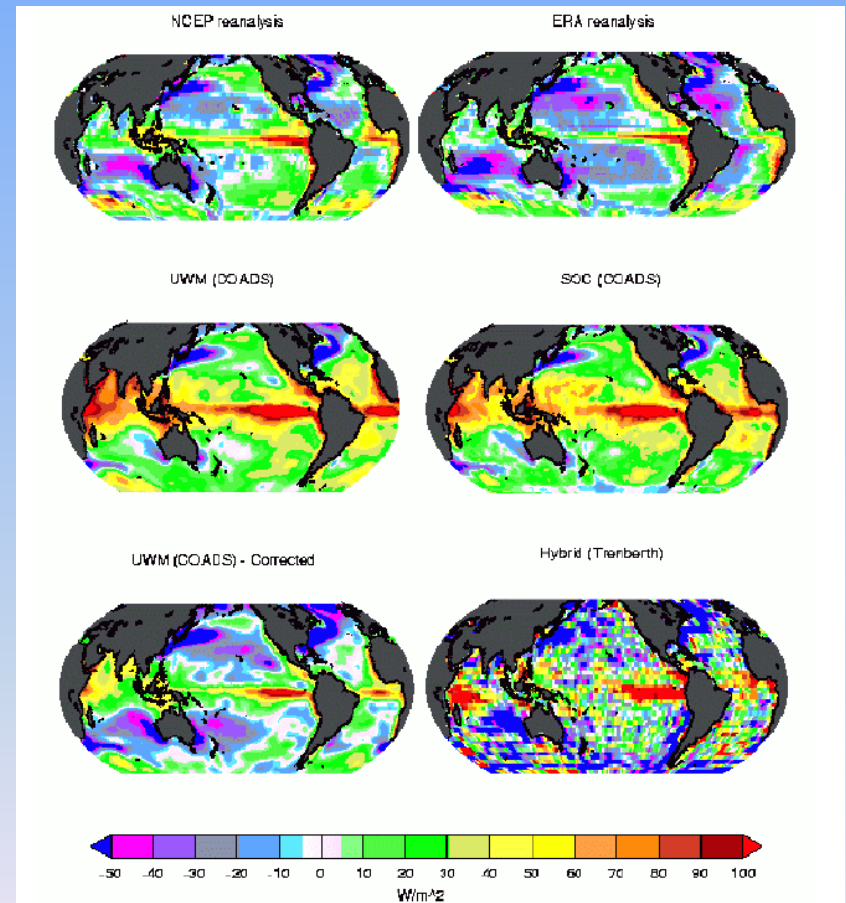


Figure 11.8.2 The annual mean climatology of six estimates of surface net heat flux. Shown are values from the NCEP reanalysis (top left), the ERA15 reanalysis (top right), the untuned UWM/COADS climatology (middle left), the SOC climatology (middle right), the tuned UWM/COADS climatology (bottom left), and the Residual method (Trenberth and Solomon, 1994) (bottom right).

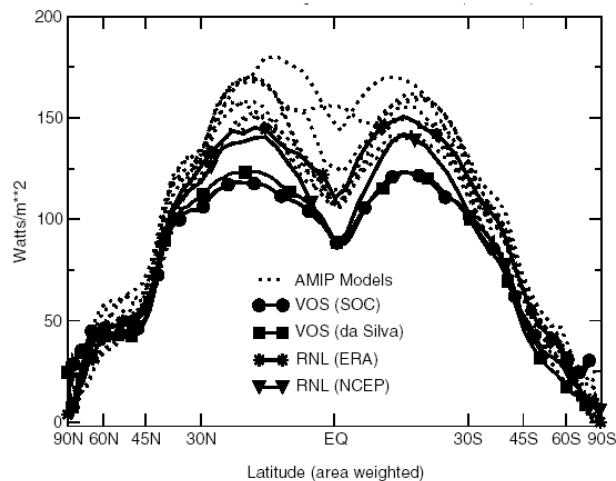
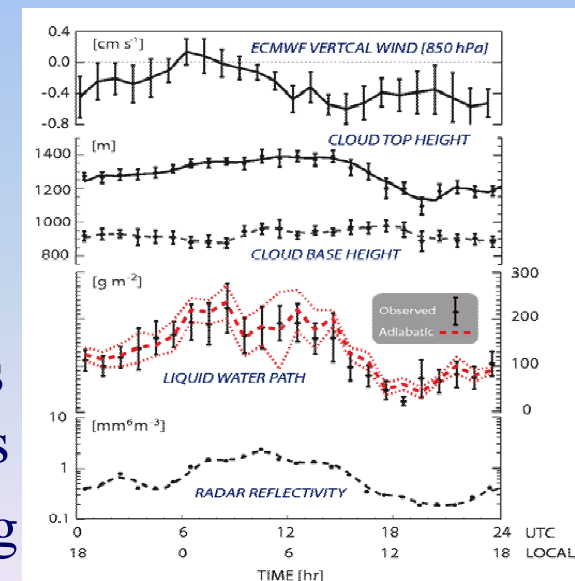
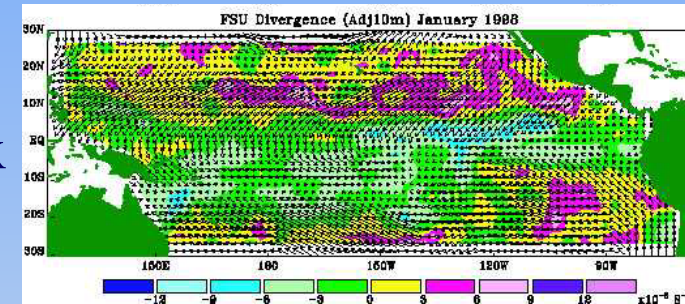


Figure 11.5.1 Zonal averages of the Global Ocean latent heat flux from reanalyses, observations (COADS) and AMIP2 (1998-99)

Role of Surface Marine Obs

Fluxes, not just SST

- Products & Validation
- Develop value-added products (anchoring flux fields)
- Validate “model” (including prediction systems) fields
- Validate satellite data and products
- Validate monitoring systems that indicate climate changes
- Characterize air-sea coupling (large and small scale)
- Monitoring
- Processes



Climate Observations For CLIVAR



- CLIVAR demands the **highest quality** of data to understand, detect, and predict relatively small changes in the climate system
- **Characterization of air-sea fluxes** remains a challenge of critical importance for CLIVAR
- 1990's brought about new technologies and capabilities to observe marine boundary-layer that could help address this need...
- How best to insure the implementation of these technologies by several somewhat disparate groups is coherent and synergistic.

High Res (High Quality) Surface Meteor Obs

- High quality = High resolution?
- Plan should explicitly address how to meet the needs of the climate community (all systems should strive to agree on standards and protocols):
 - Consistent data and metadata
 - Data quality attributes (important for climate!)...better inter-calibration
 - Delivery of data as much as possible in real-time
 - Value-added products helpful to users, and
 - Assessment of these obs in context of other obs systems and products (routine VOS, satellite, other products)
- Air-sea fluxes of heat, moisture, and momentum are critical!