Flux Measurements on Torrero Equatorial Cruise

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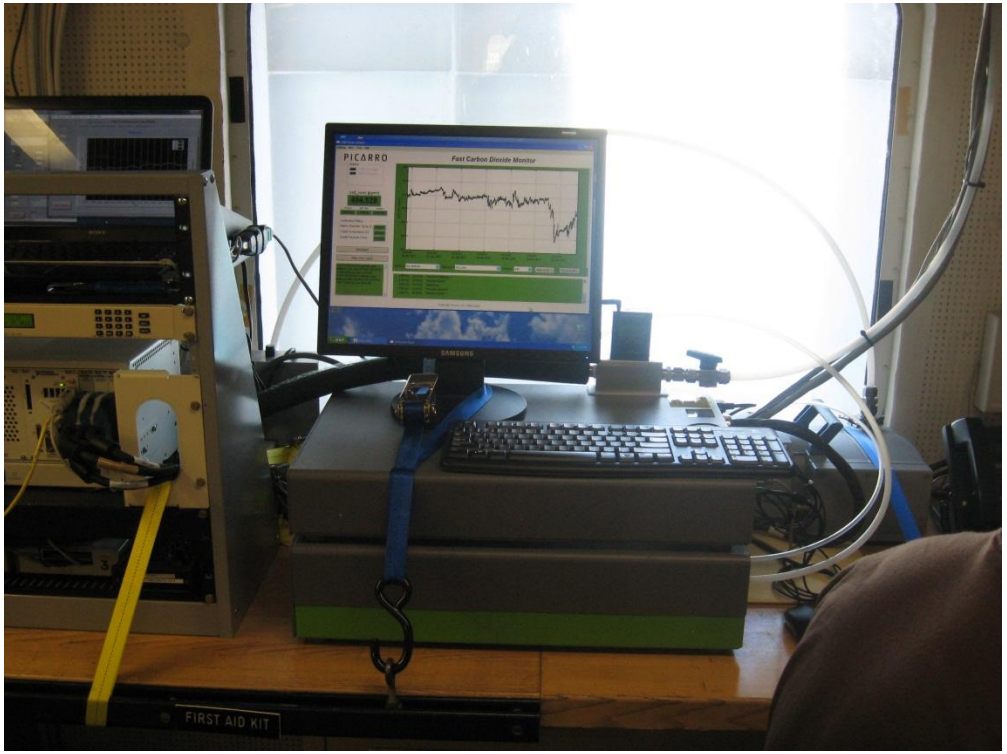
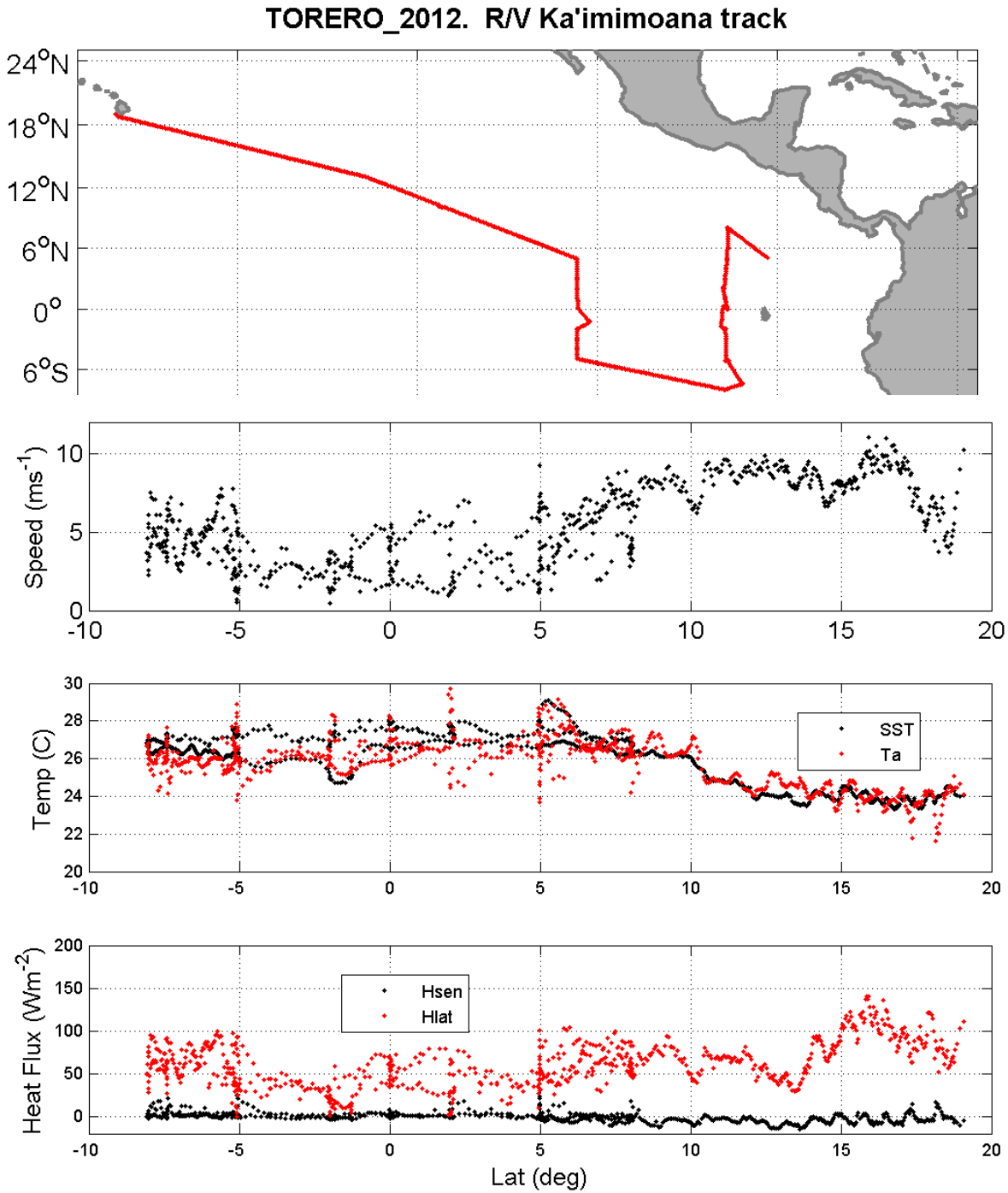
- R/V Ka'imiMoana
- TAO 95/110 W buoy cruise Feb 2012
- TORRERO organic emissions project
- U. Hawaii and NOAA/PSD flux obs

BACKGROUND: More than you could possibly want to know about equatorial E. Pacific -
Fairall, C. W., J. E. Hare, T. Uttal, D. Hazen, Meghan Cronin, Nicholas A. Bond, and Dana Veron, 2008: A seven-cruise sample of clouds, radiation, and surface forcing in the Equatorial Eastern Pacific. *J. Clim.*, **21**, 655-673.

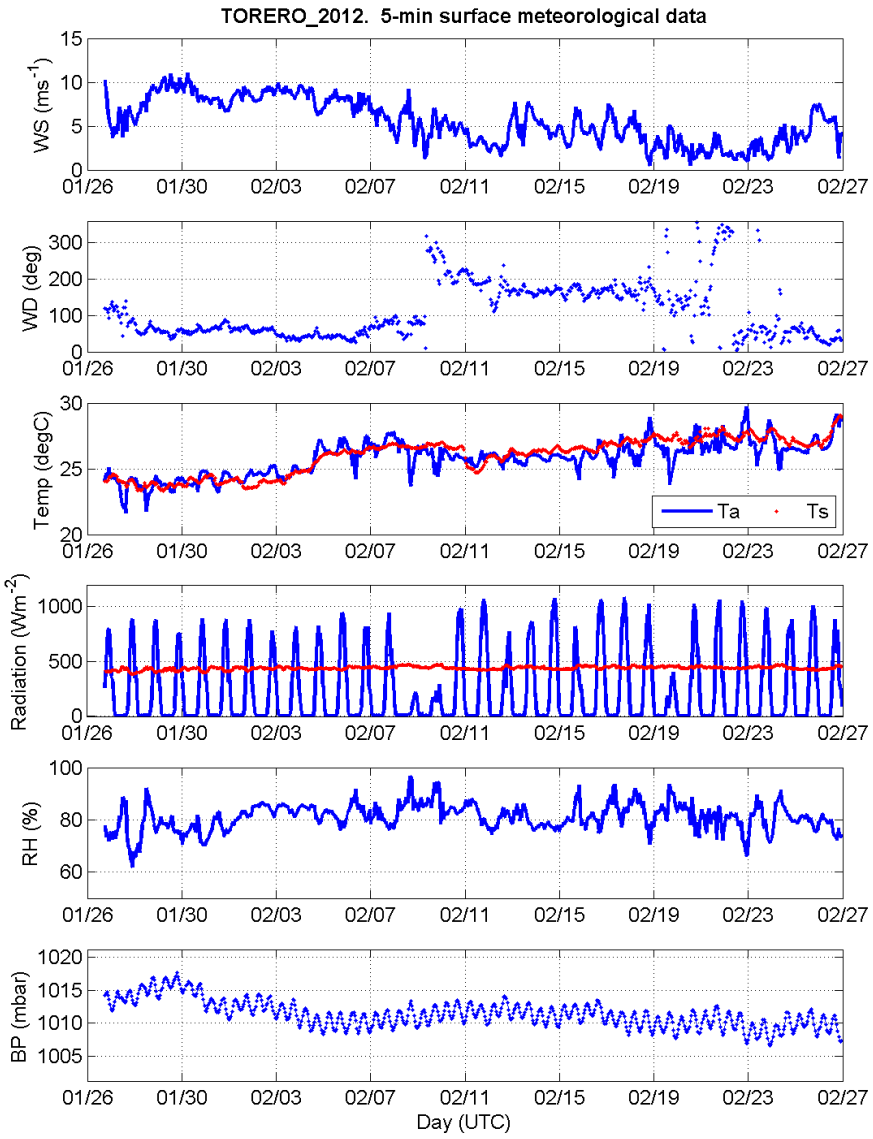
Table 1. Instruments/measurements Univ. Hawaii and NOAA/ESRL for TOERO		
Item	System	Measurement
1	Air-sea flux system	Motion corrected turbulent fluxes
2	Pyranometer &Pyrgeometer	Downward solar radiative, IR flux
3	Bulk meteorology	Surface Water Temp, Air Temp, RH, Wind Speed, Rain rate
4	Closed Path Picarro CRD Analyzer	CO2
5	GPS	Ship Heading and position
6	“Sea Snake”	Near surface sea temperature

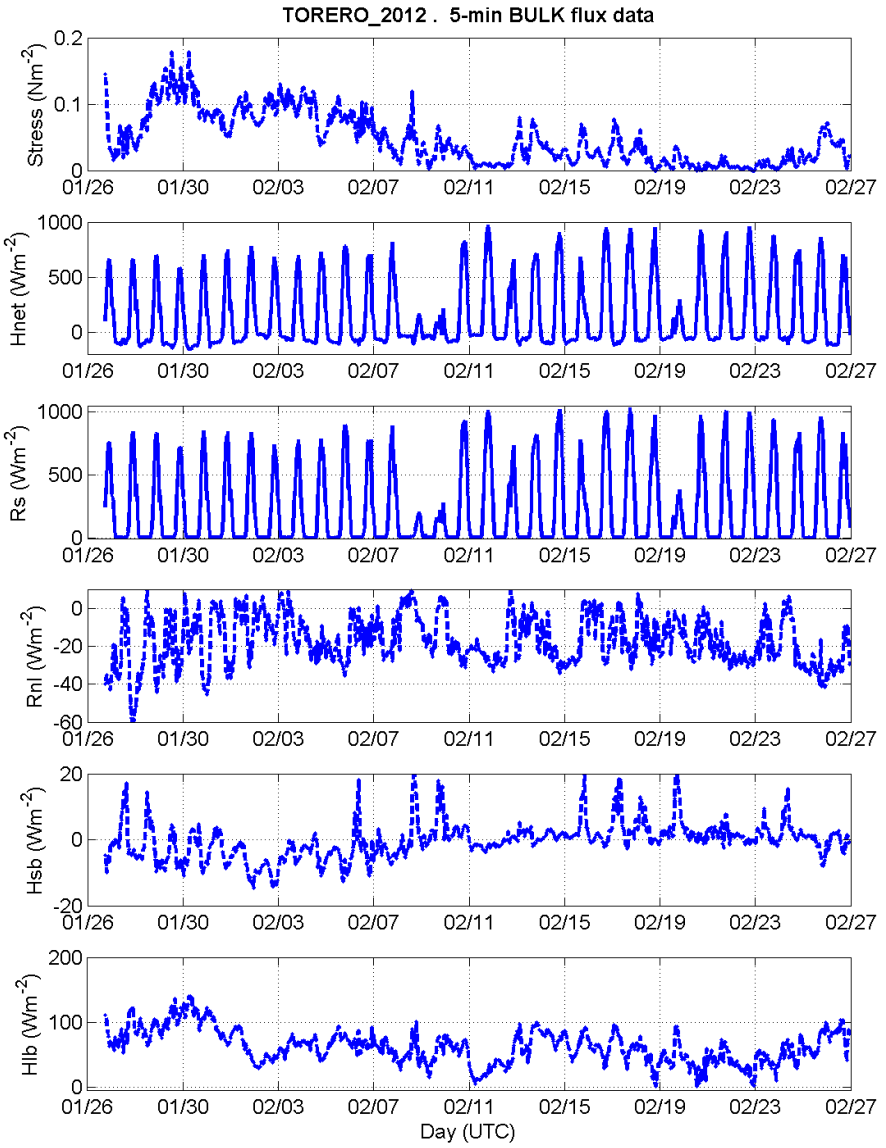


ftp://ftp1.esrl.noaa.gov/psd3/cruises/TORERO_2012/Kaimimoana/Scientific_analysis/

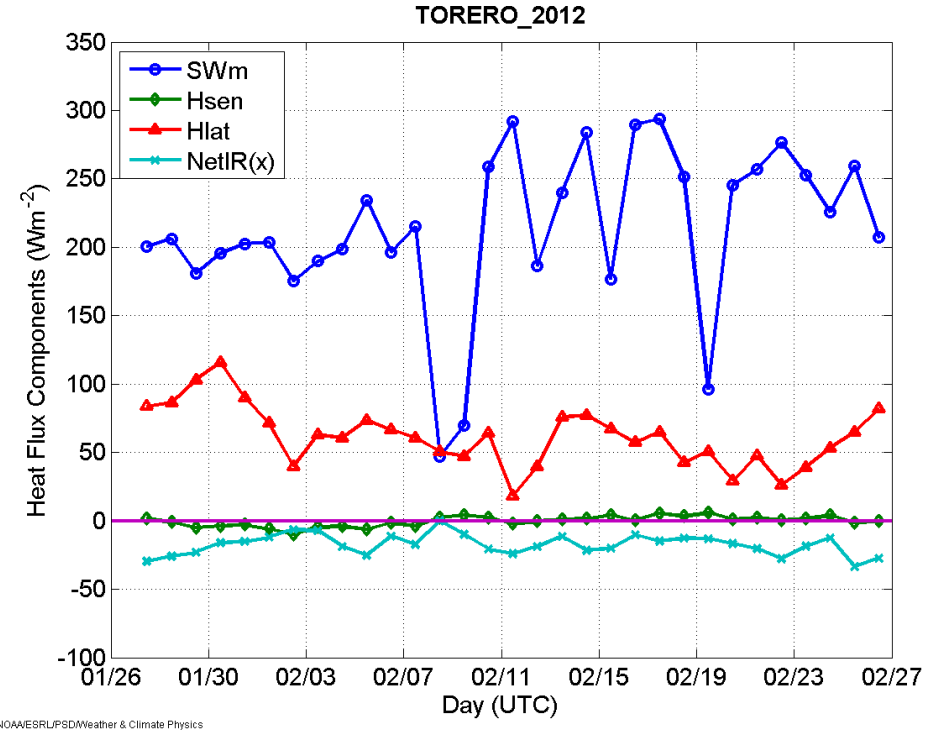

TORERO_2012. R/V Ka'imimoana track
24°N
18°N
12°N
6°N
0°
6°S
Speed (ms-1)
Temp (C)
SST
Ta
Heat Flux (Wm-2)
Hsen
Hlat
Lat (deg)

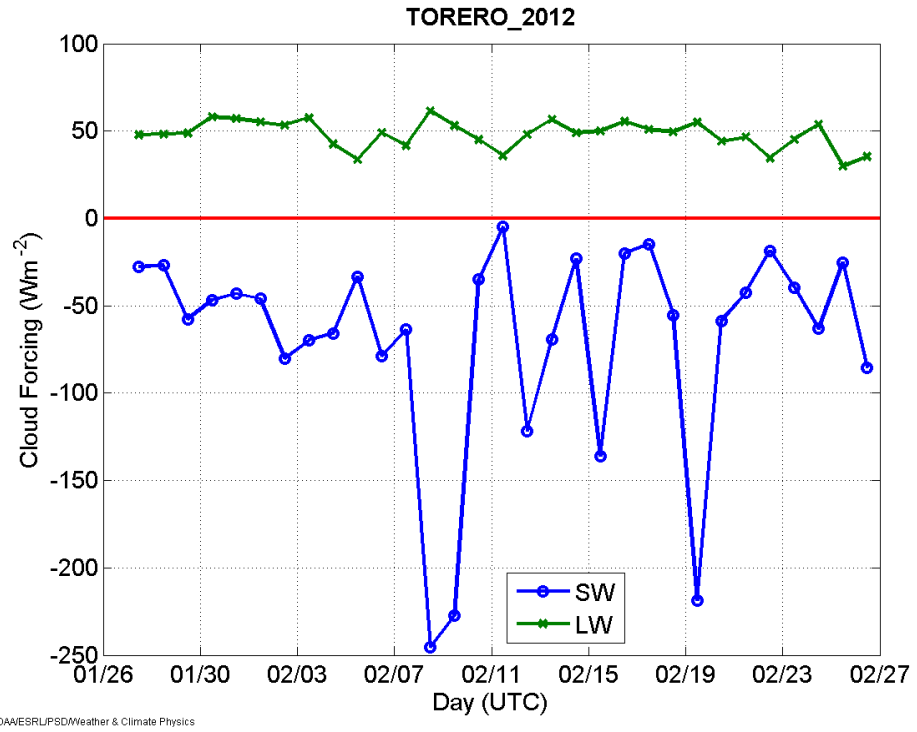
Meteorology and Flux Time Series





Flux Components and Cloud Forcing

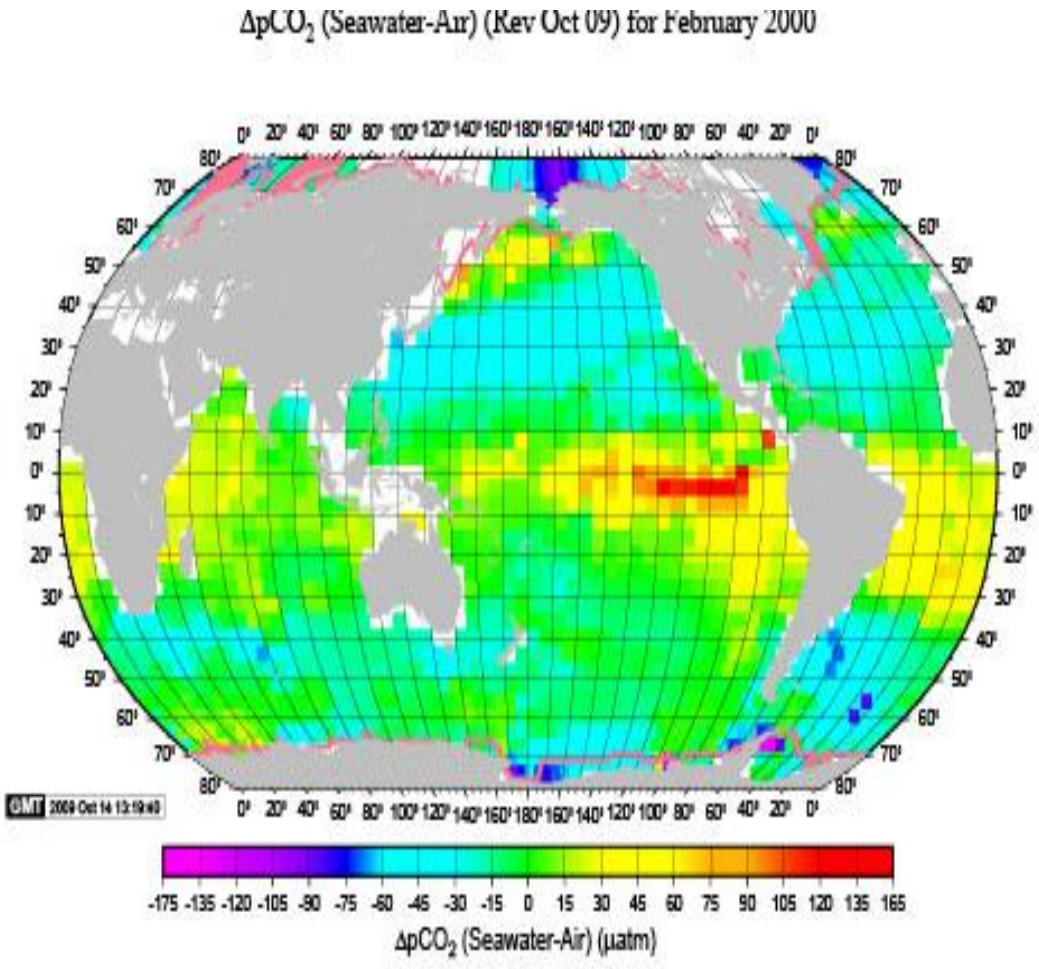


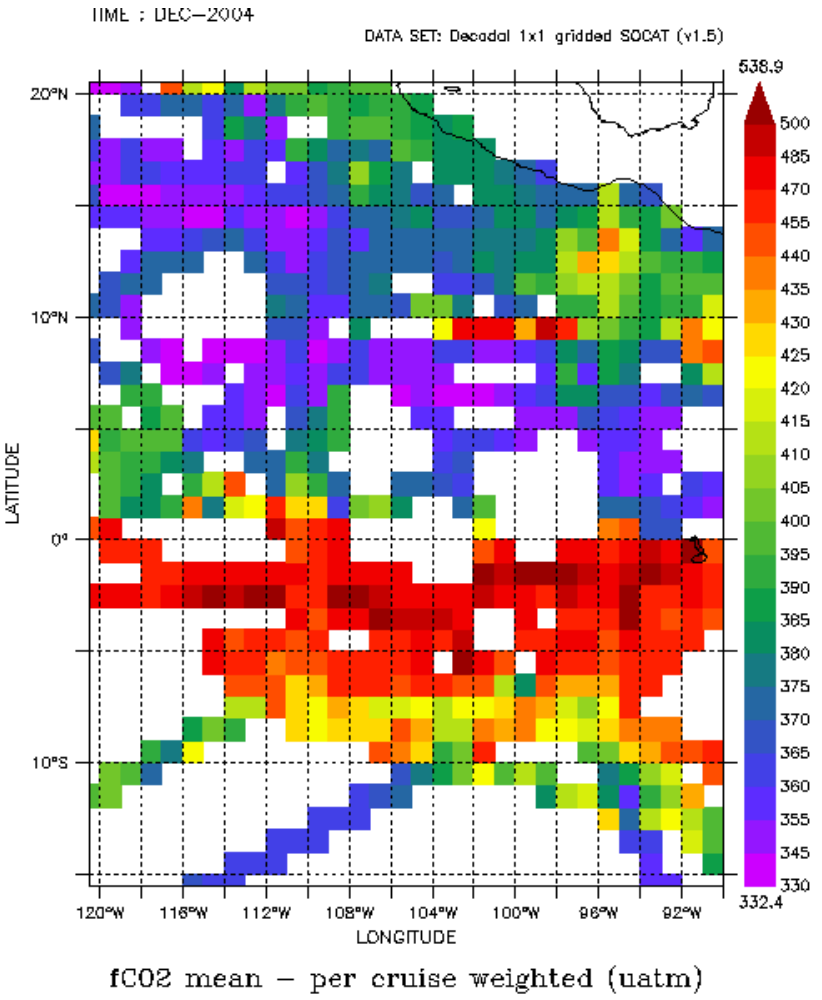


Climatology of $DPCO_2$

10 yr Average

February

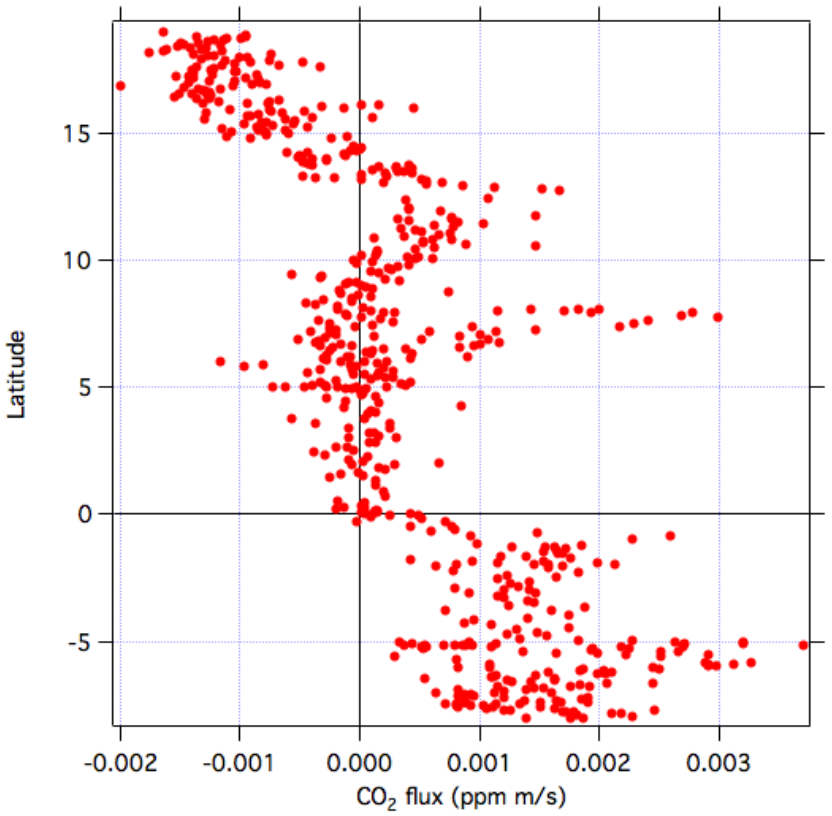




CO_2 Flux and Flux/(αk_{coare})

Since we do not have observations of $DPCO_2$ from the ship, we converted the flux observations to estimates of $DPCO_2$ by dividing the flux by solubility and transfer coefficient

$$Flux = < w'c' >$$



$$\Delta PCO_2 = Flux/(\alpha k)$$