
Florida...
The
Sunshine
PLYWOOD State

Aircraft-Based Ocean Profiling During Weak and Strong Winds

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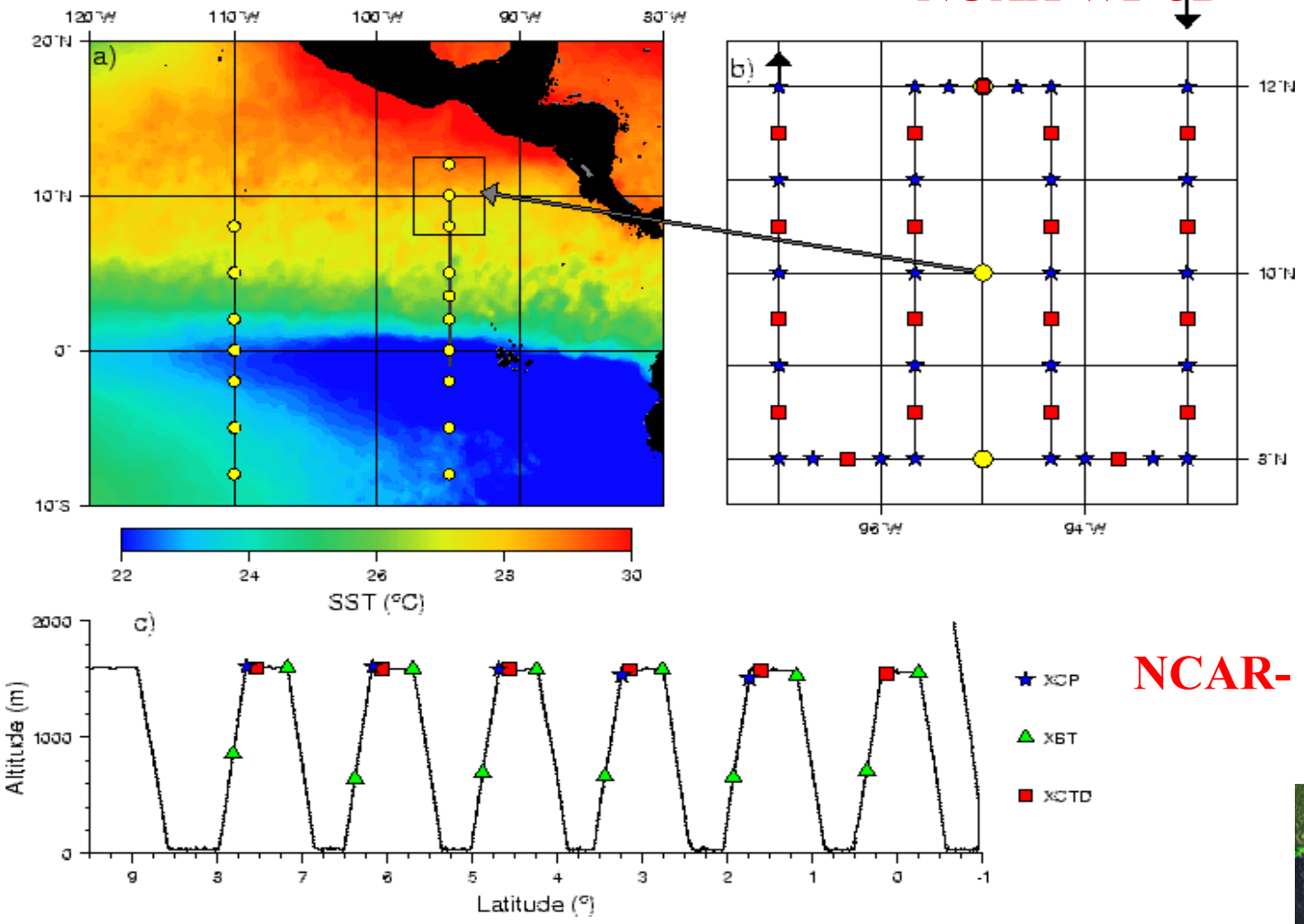
Goal: To profile the upper ocean over mesoscale to improve our understanding of coupled processes and air-sea interactions.

NSF and NOAA Support

NSF/NOAA EPIC Aircraft and TAO Buoys Sample Strategy

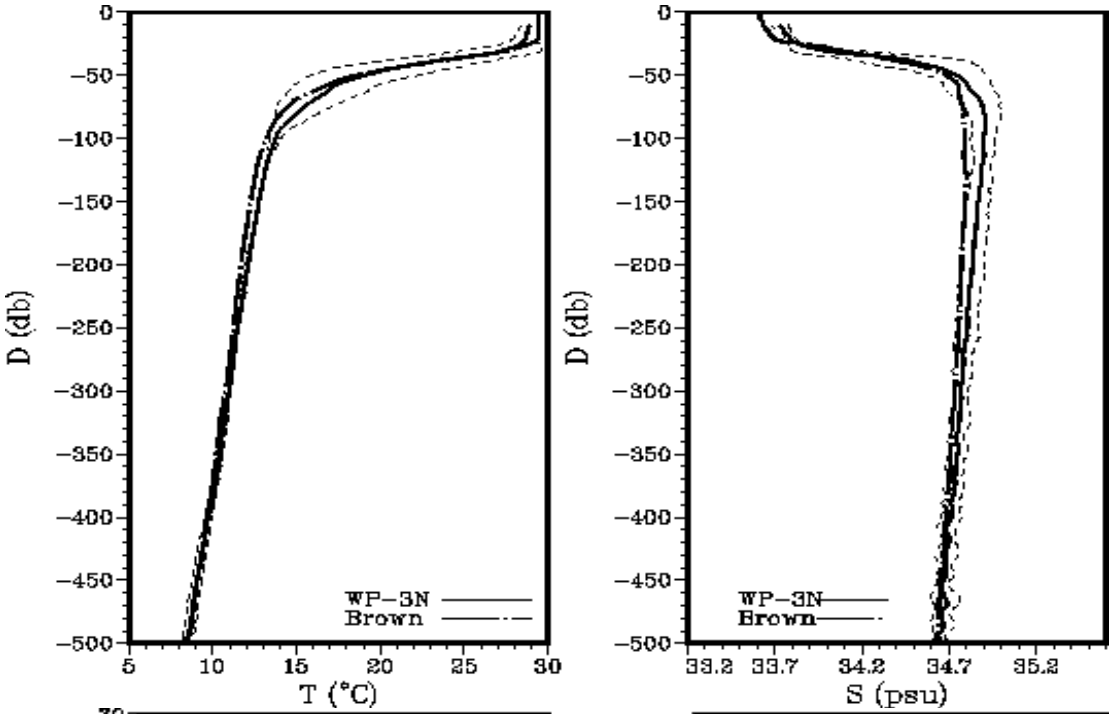
NOAA WP-3D



NCAR- C130

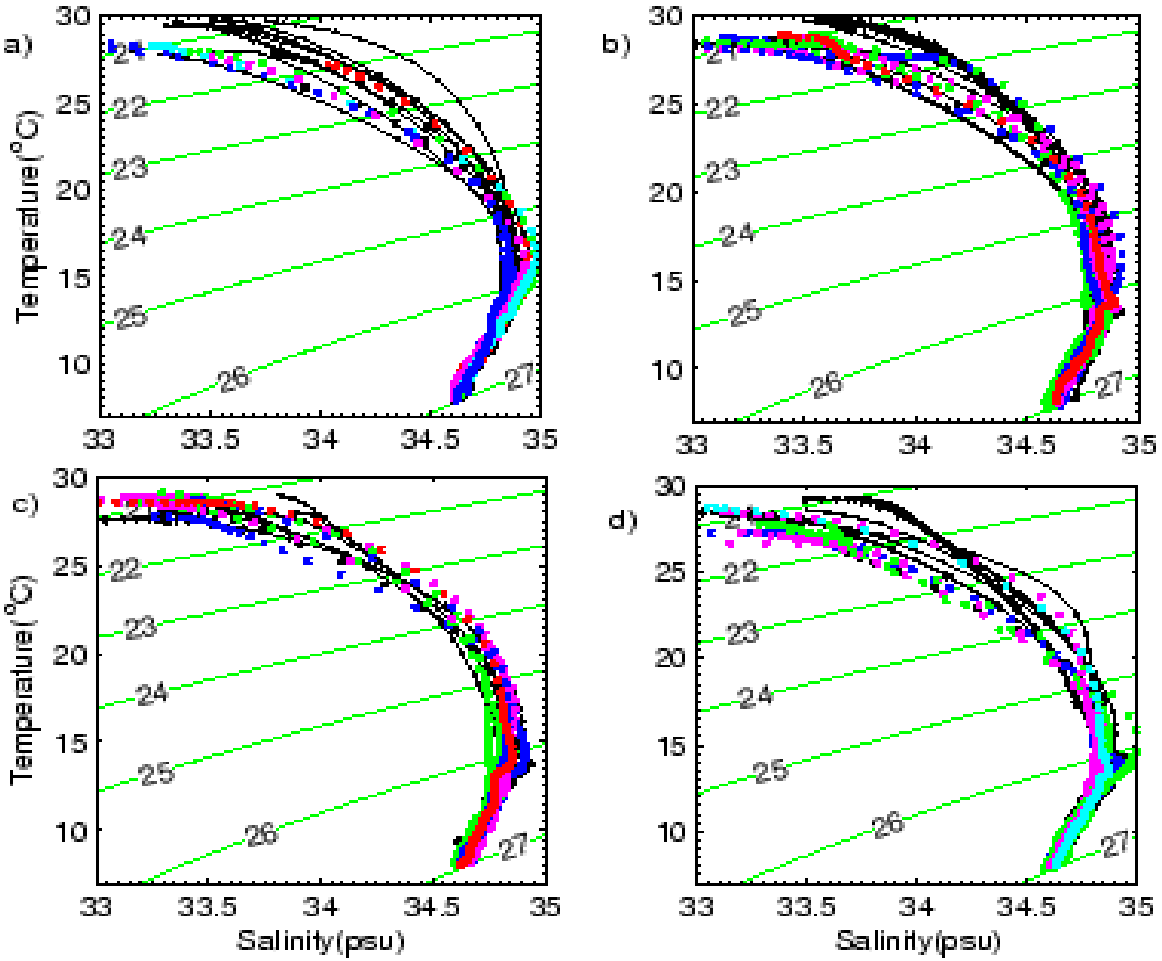
Platform	Date	Flight Number	AXCP	AXCTD	AXBT	Type
WC-130J	12 Sept	TF04	1(1)	2(0)	8(0)	Test
WP-3D	13 Sept	010913I	28(4)	19(0)		Grid
WC-130J	14 Sept	RF06	6(3)	5(0)	13(7)	95W
WP-3D	16 Sept	010916I	28(5)	20(8)		Grid
WC-130J	19 Sept	RF08	5(2)	7(1)	12(2)	95W
WP-3D	20 Sept	010920I	26(8)	19(2)	3(0)	Grid
WP-3D	21 Sept	010921I			10(1)	Invest
WC-130J	23 Sept	RF10	6(2)	6(1)	12(2)	95W
WC-130J	25 Sept	RF11	6(0)	5(0)	12(0)	95W
WP-3D	28 Sept	010928I	4(0)	3(1)		Grid
WC-130J	2 Oct	RF14	5(0)	6(2)	13(0)	95W
WC-130J	3 Oct	RF15		15(2)		SST
WP-3D	3 Oct	011003I	26(4)	20(1)	1(1)	Grid
WC-130J	5 Oct	RF16		15(4)		SST
WP-3D	5 Oct	011005I	27(5)	19(2)		Grid
WP-3D	6 Oct	011006I			45(6)	Grid
WP-3D	7 Oct	011007I	27(1)	20(5)		Grid
WC-130J	9 Oct	RF18	5(1)	9(2)	18(3)	95W
WC-130J	10 Oct	RF19	8(1)	9(1)	20(4)	95W
Total			207(37)	170(26)	197(32)	

NOAA R/V Brown Versus WP-3D CTDs -10N

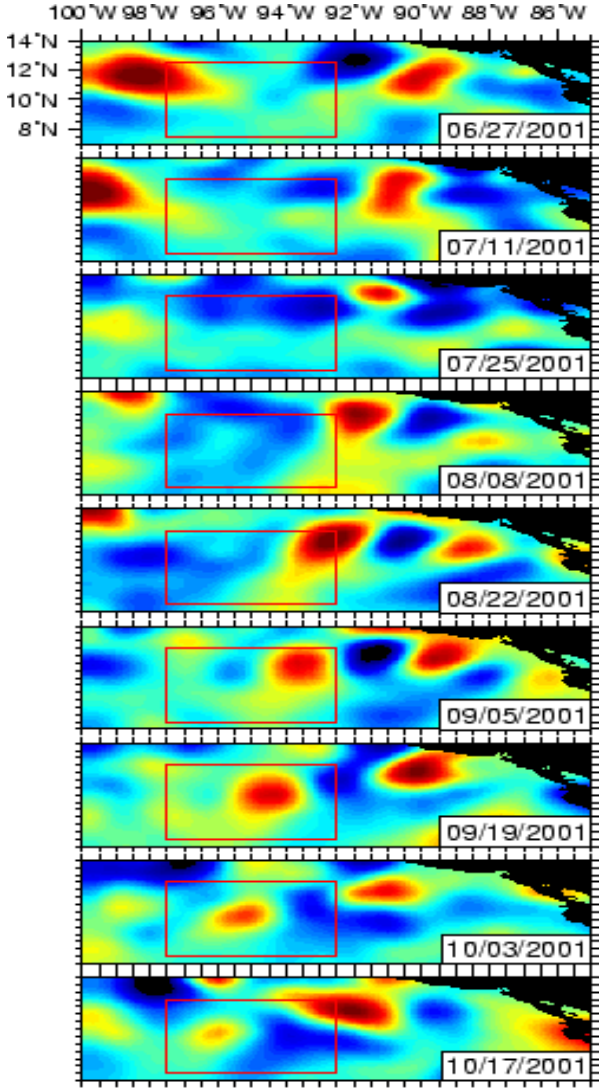


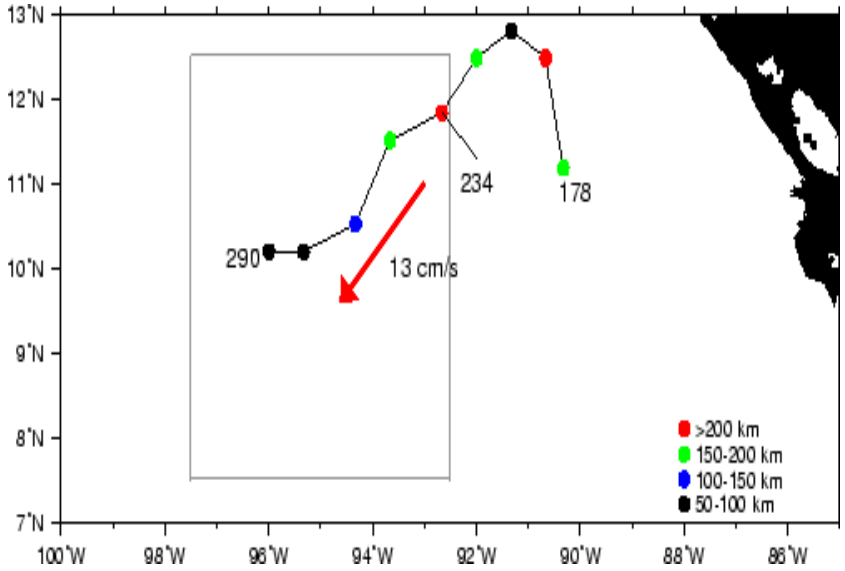
Airborne Oceanography Works!

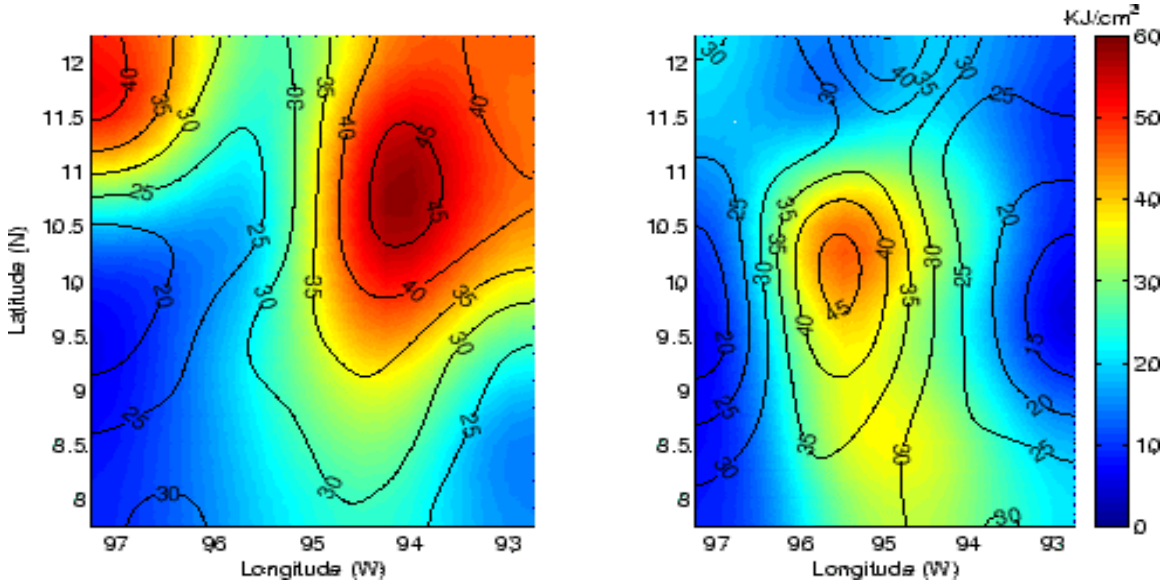
TS Diagrams a) 93W, b) 94.3W, c) 96.6W and d) 97W



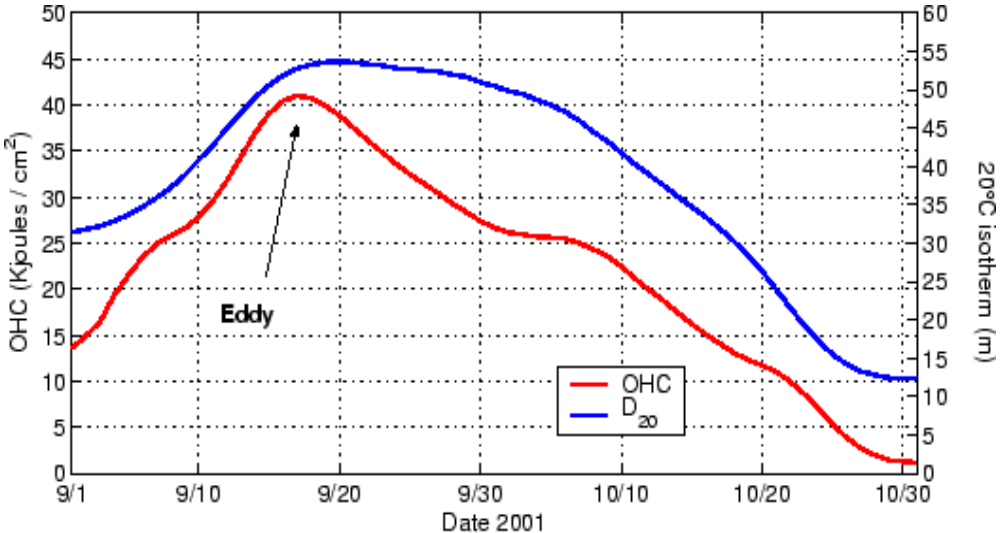
Blended Altimetry Derived Fields and Warm Eddy Pathway.





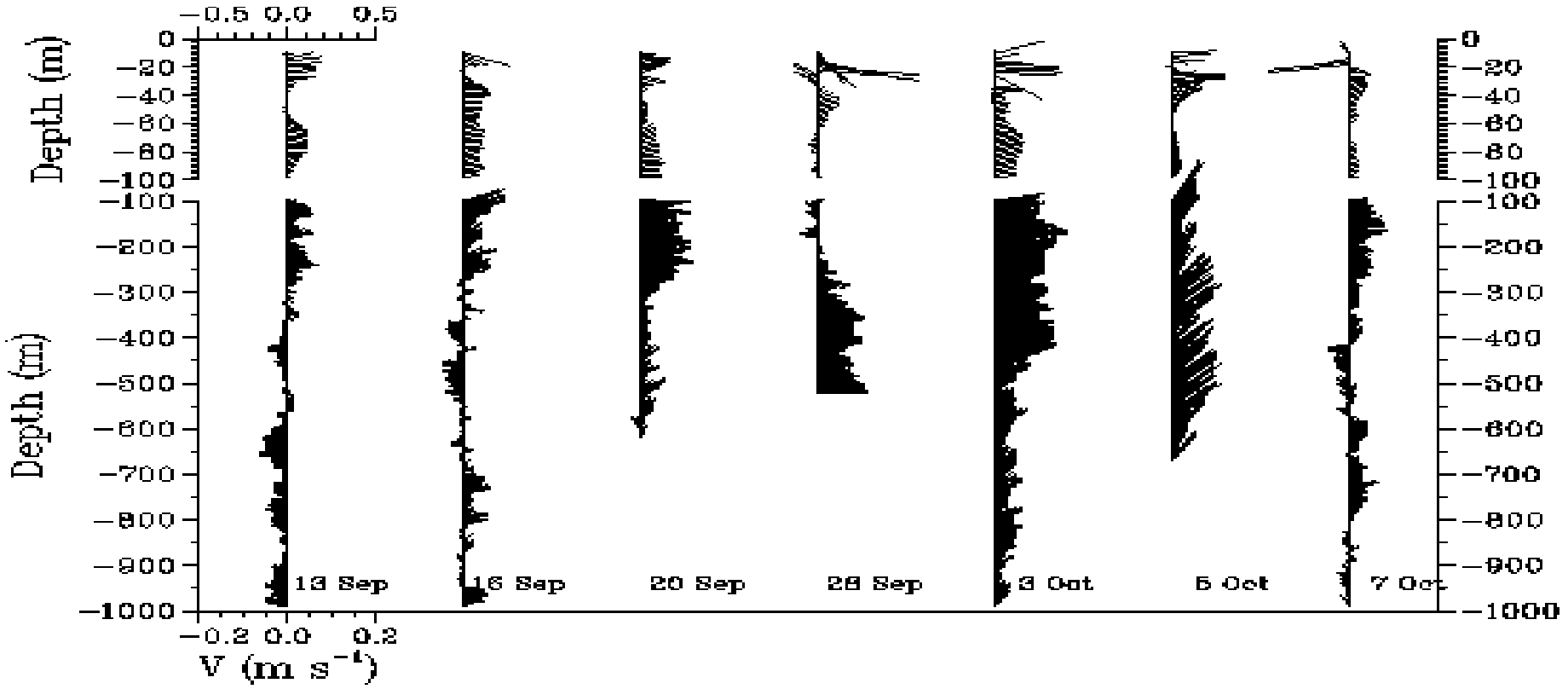


Sept (left) and Oct (right) OHC of Warm Core Eddy



10°N TAO Mooring OHC and D20°C. The shallow isotherm depths may be an indication of the Costa Rica Dome.

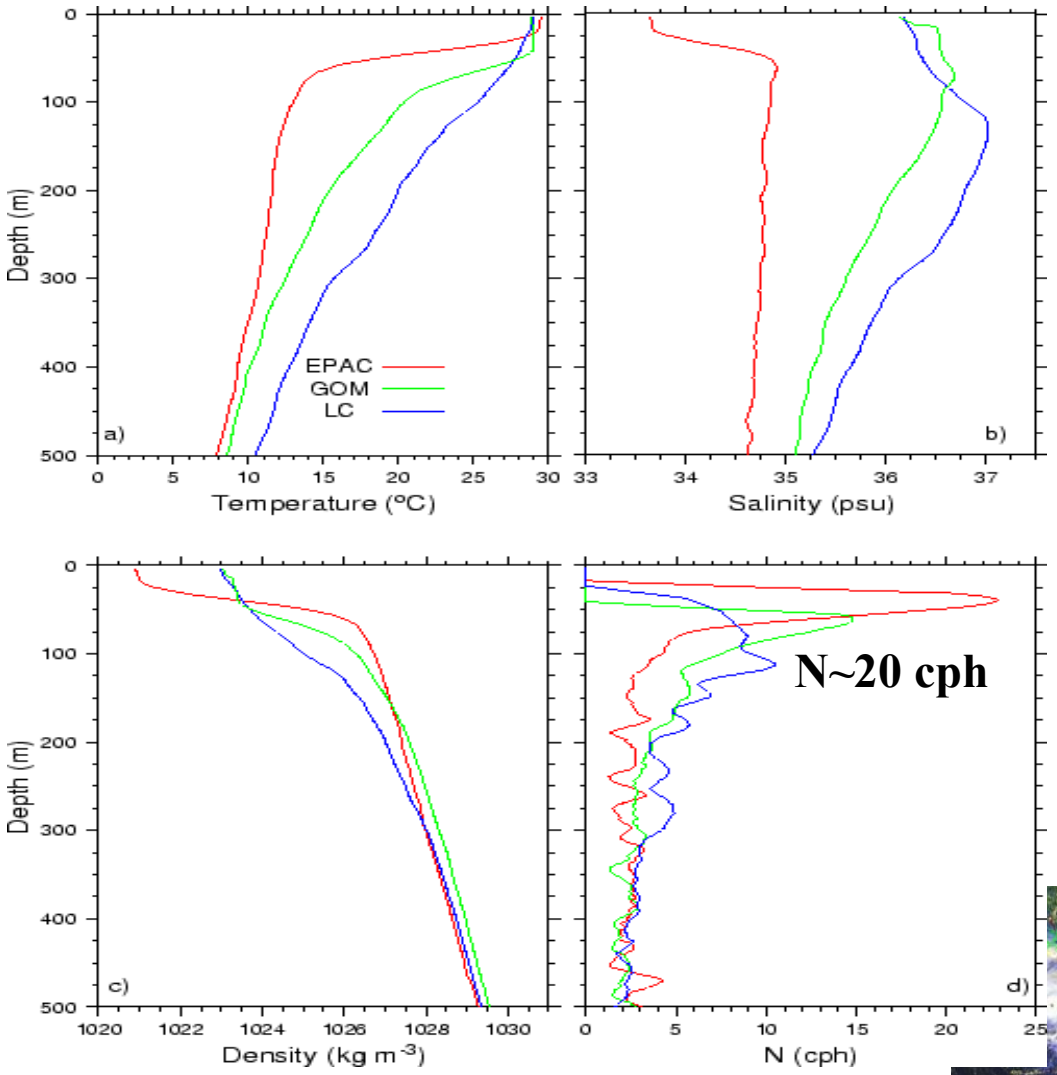
Flows Along the Eastern Edge of CRD.

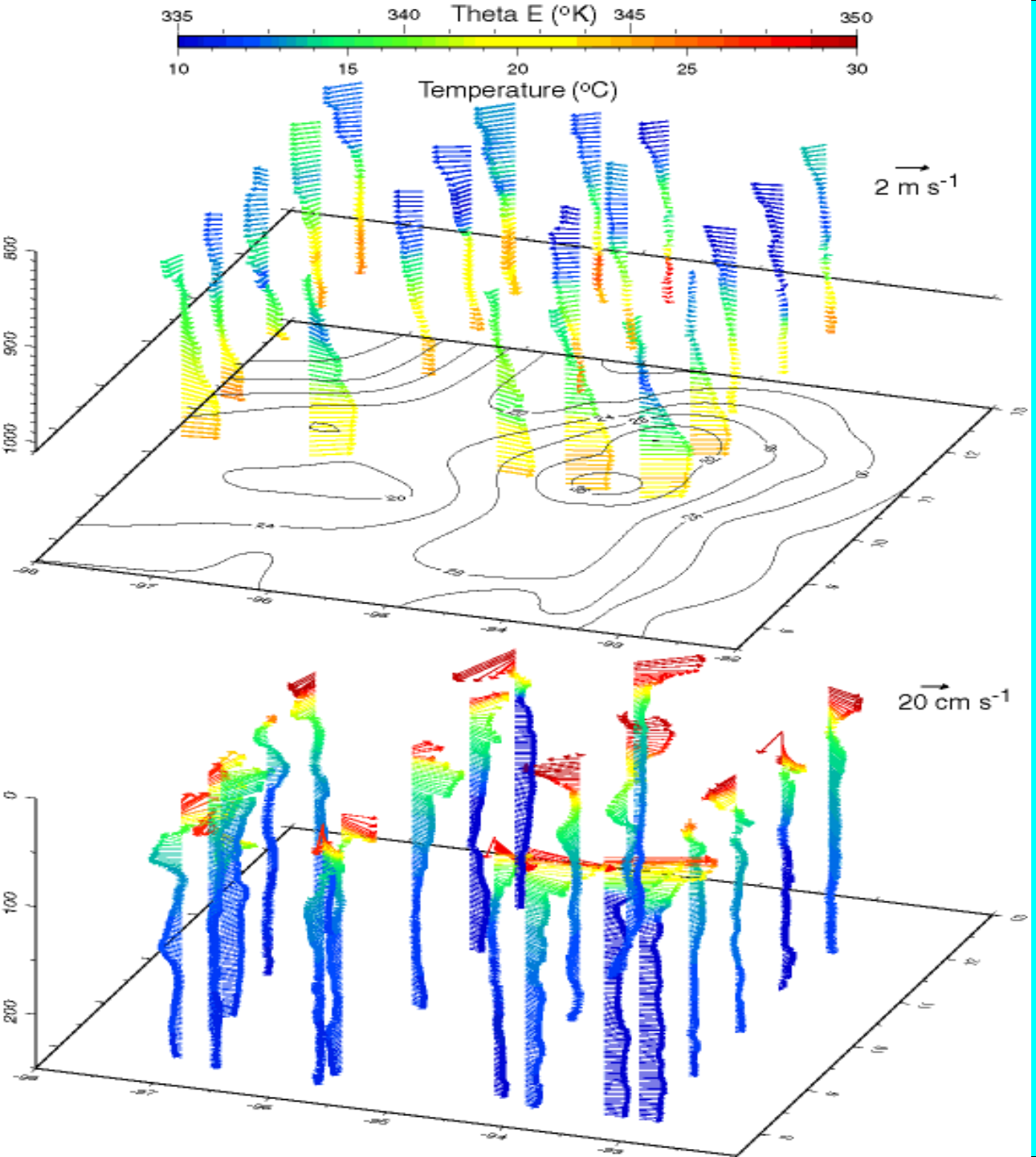


EPAC Paradox

Strong vertical temperature, salinity and density gradients at base of OML in EPAC…

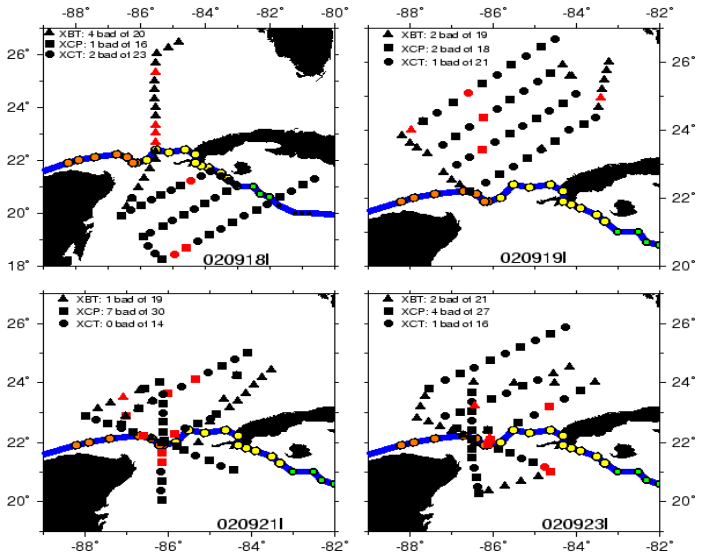
Implications for mixing…and ocean (SST) cooling.

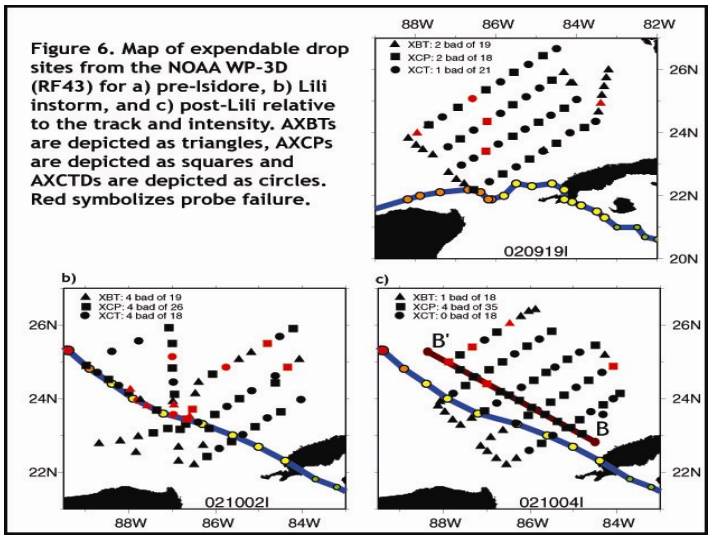


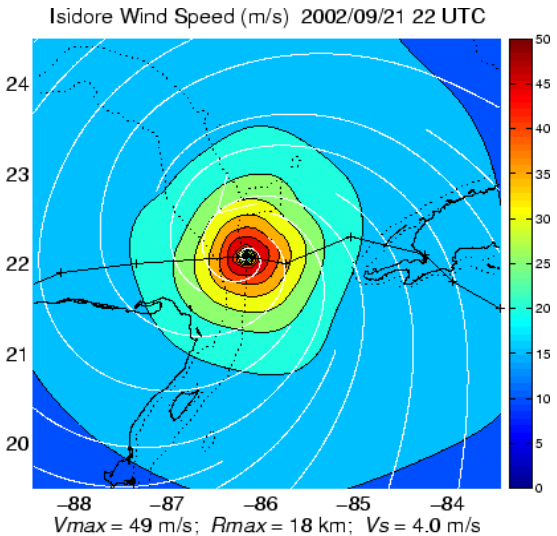


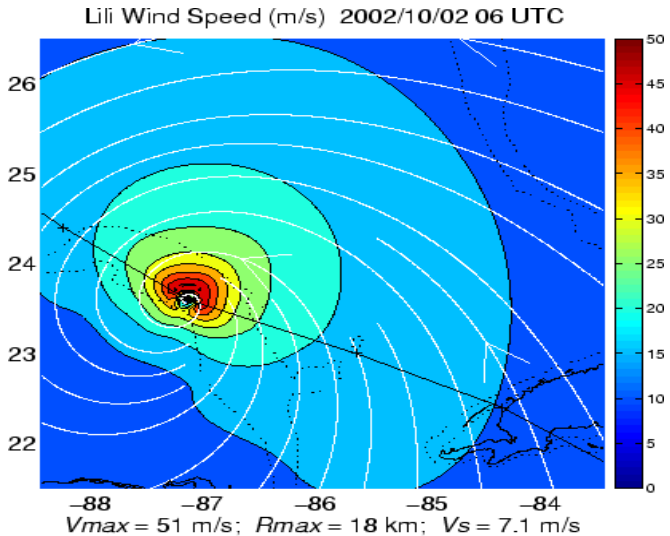
Atmosphere and Ocean Structure: EPIC

Isidore (02) (left) Lili (right) AXCP/AXCTD/AXBTs

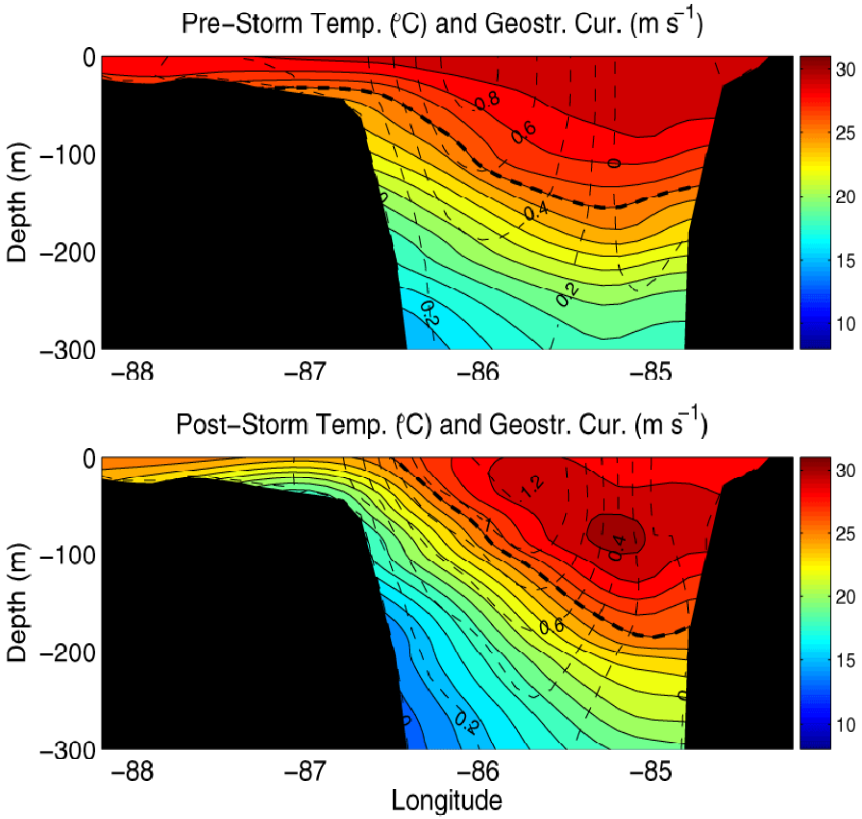


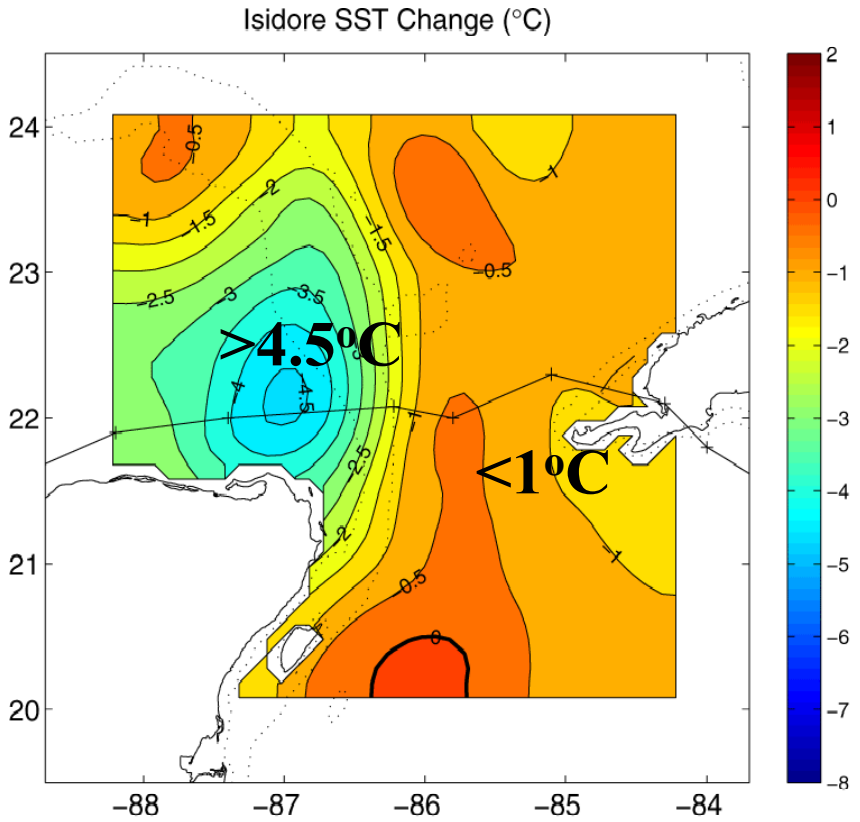




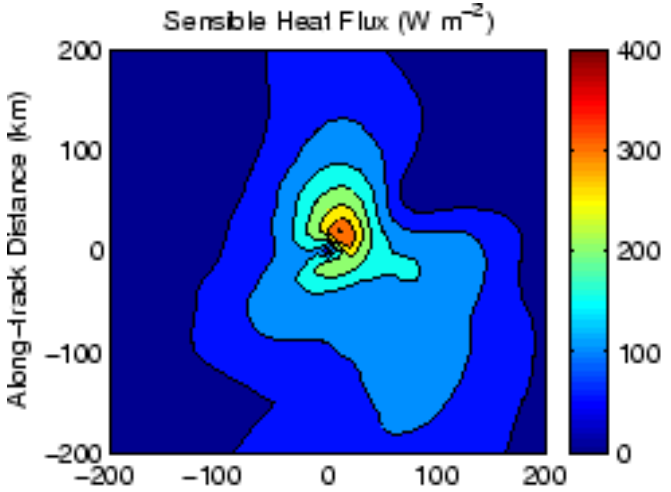


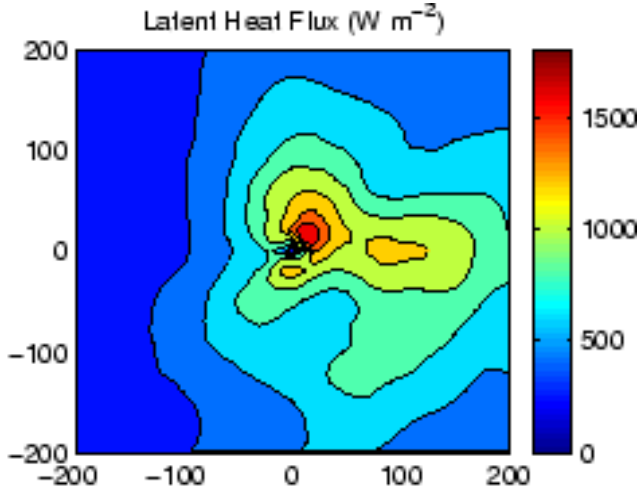
Pre/Post Isidore Section and SST Change

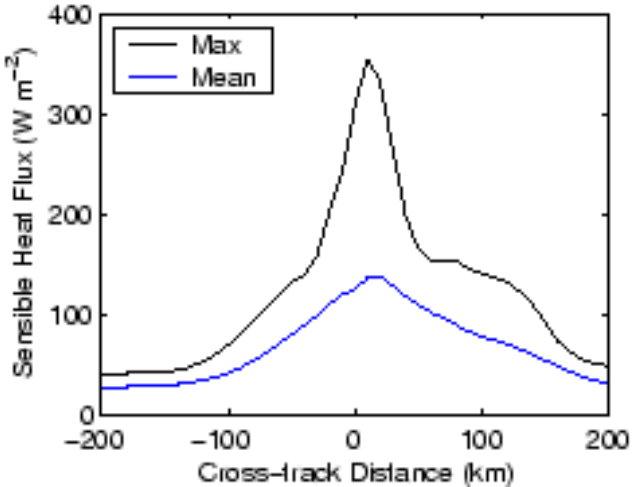


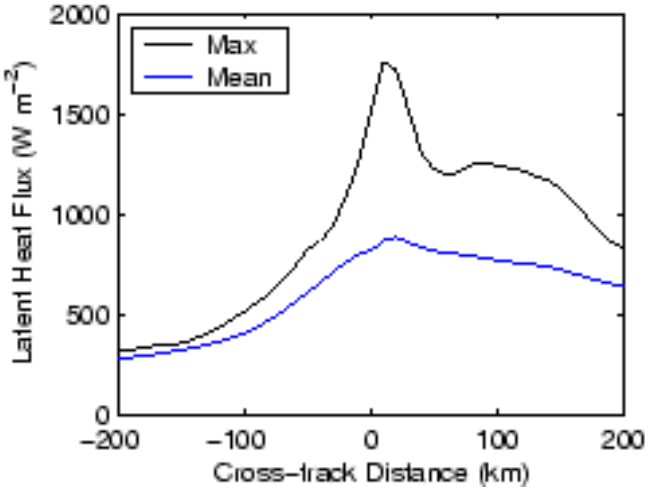


Hurricane Lili 2 Oct 02: Fluxes

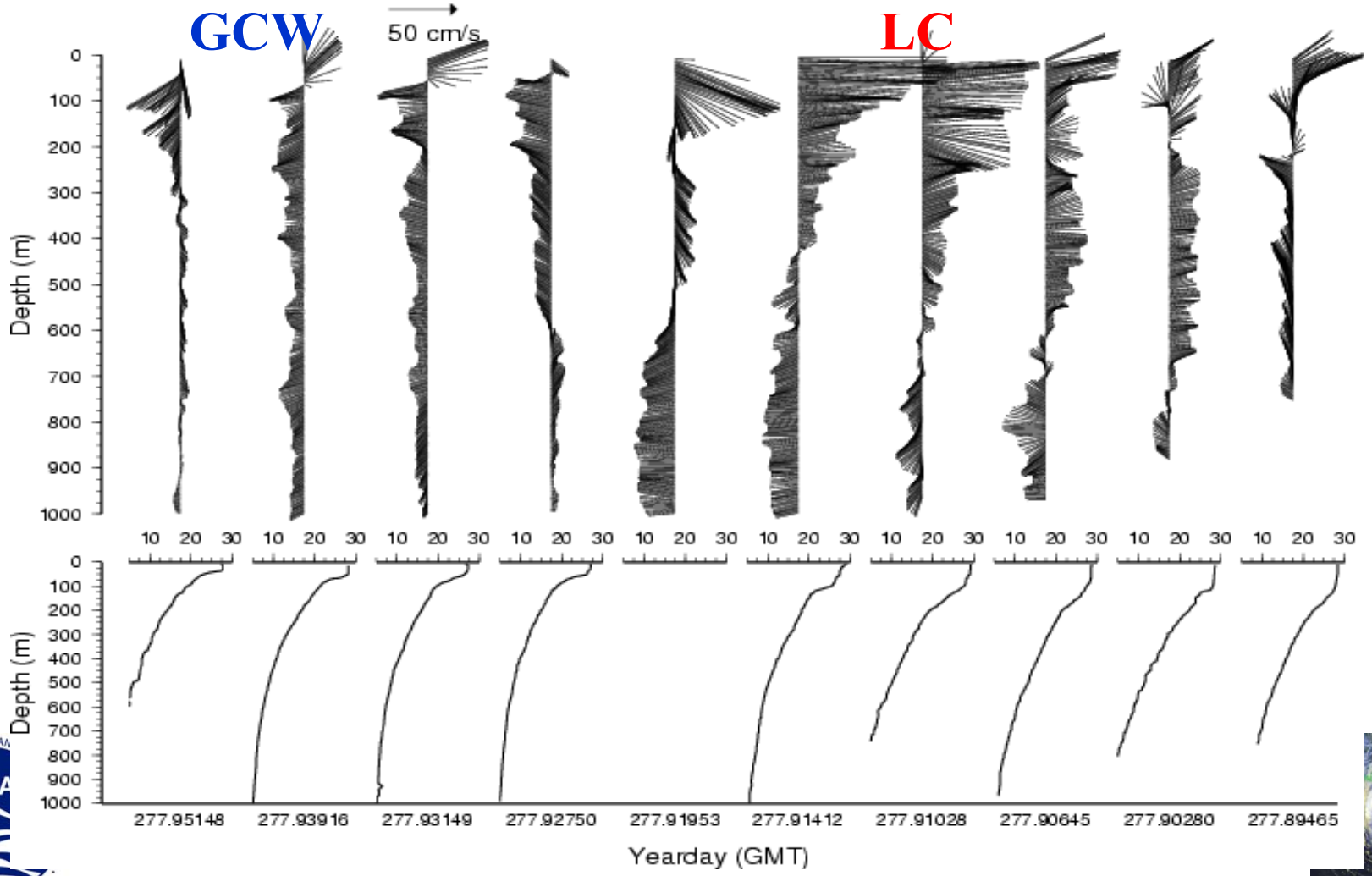




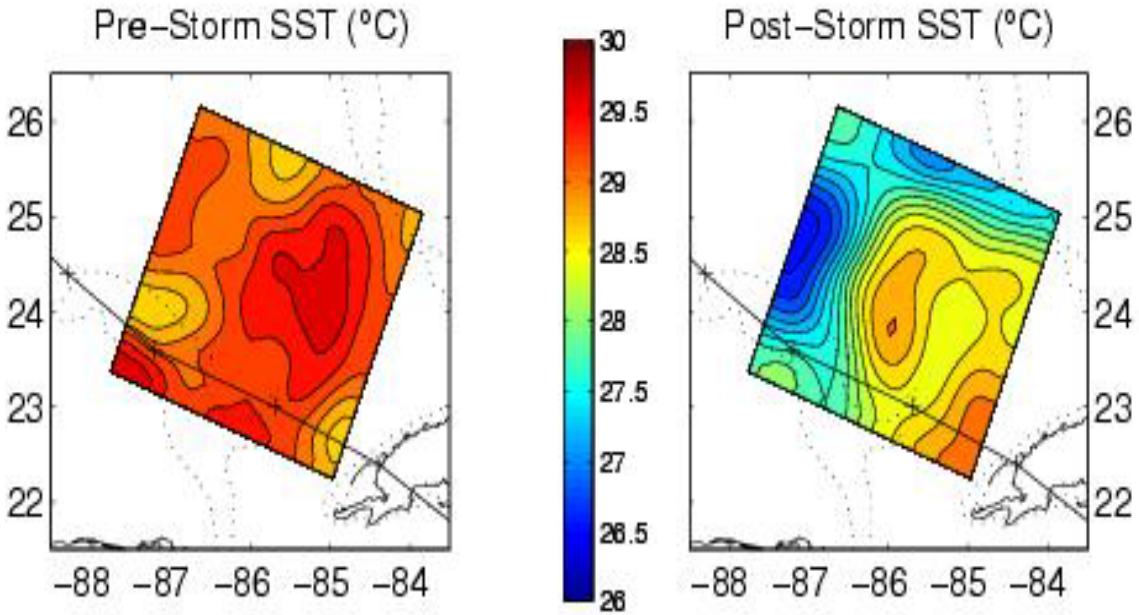


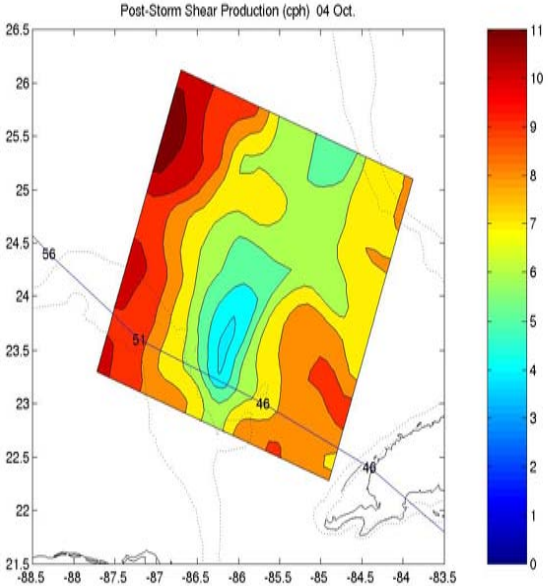


Hurricane Lili Post-Storm AXCP Transect at $2R_{max}$

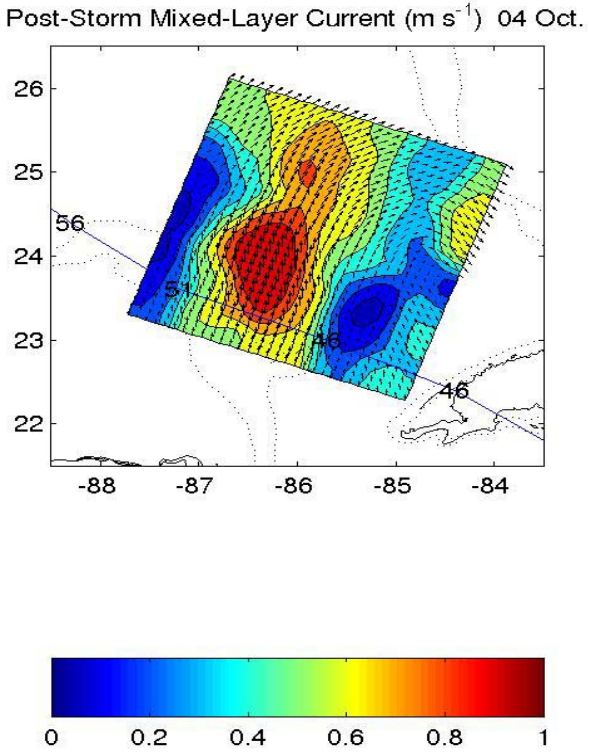


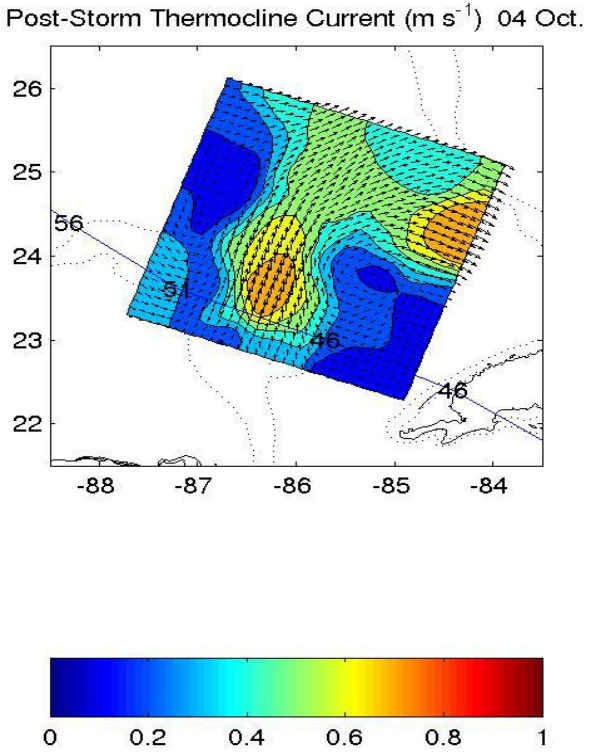
Lili Pre and Post SSTs

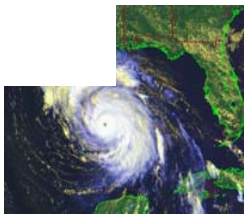




Lili Post-OML and Thermocline Currents







Summary and Concluding Remarks:

EPIC data acquired under weak winds reveal a westward propagating warm core ring excited by Tehuantepec winds.

OHC from AX…consistent with those from TAO mooring at 10°N where OHC <60 kJ cm^{-2} than warm features in the western Atlantic Ocean Basin (>100 kJ cm^{-2}).

Strong stratification (N ~ 20 cph) at the OML base precludes strong mixing during TC passage over the warm pool.

Profiling during Hurricanes Isidore, Lili (02) resolved the Loop Current Structure 1°C (10 kJ cm^{-2}) cooling observed as these storms intensified to severe status.

Warm and cold core rings well resolved post-Katrina/Pre-Rita and Post-Rita. Both the WCR/CCR impacted Rita's intensity.

Aircraft platforms-excellent way to map 3-D mesoscale oceanic structures to depths of 1000 to 1500 m to couple to atmosphere.