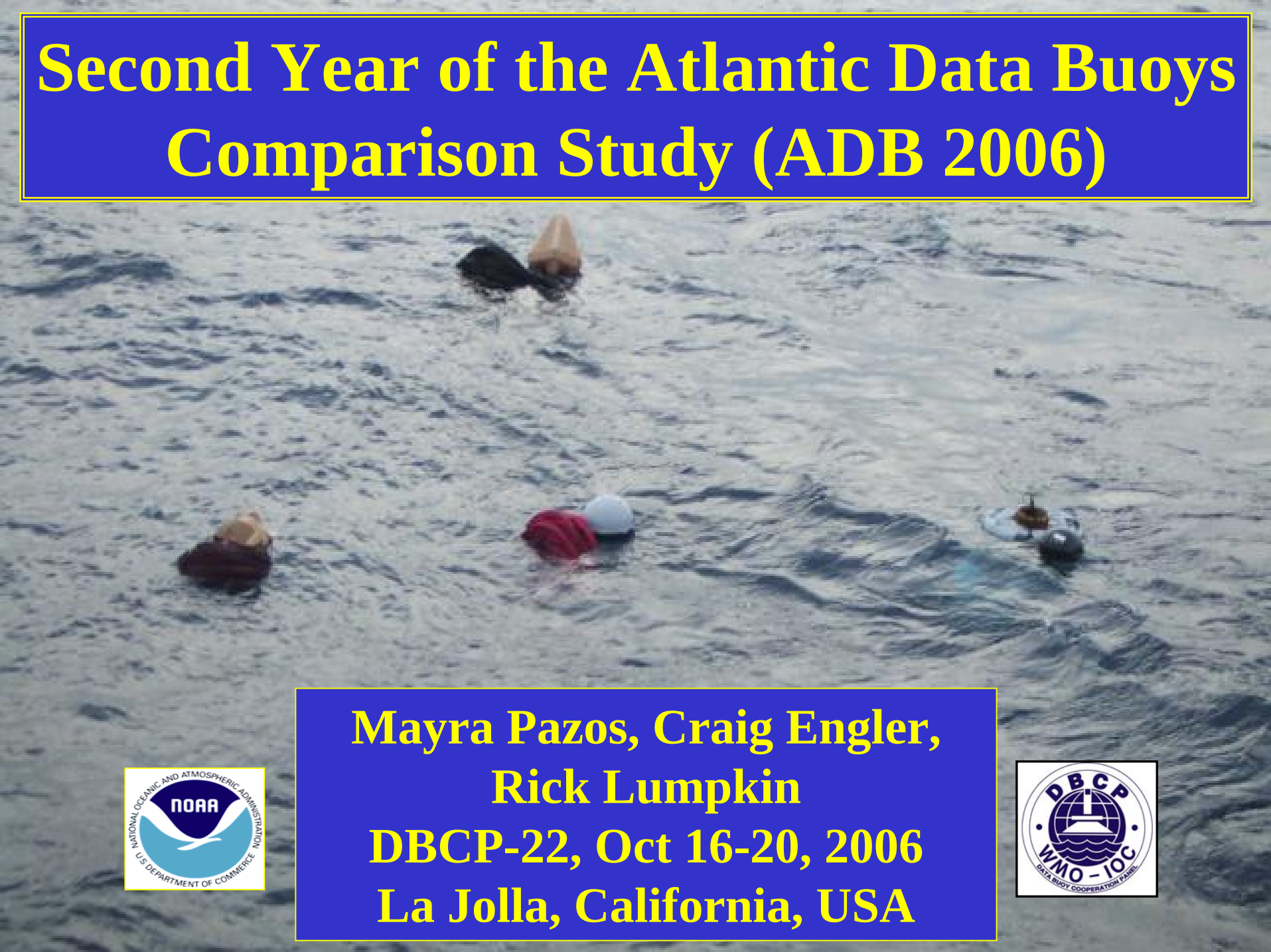
Second Year of the Atlantic Data Buoys Comparison Study (ADB 2006)



Mayra Pazos, Craig Engler, Rick Lumpkin

DBCP-22, Oct 16-20, 2006
La Jolla, California, USA

Second Year Atlantic Data Buoys Study

- The Global Drifter Program continued the 2005 comparison study of SVP drifters built with the mini drogue. This study is called Atlantic Data Buoys (ADB).

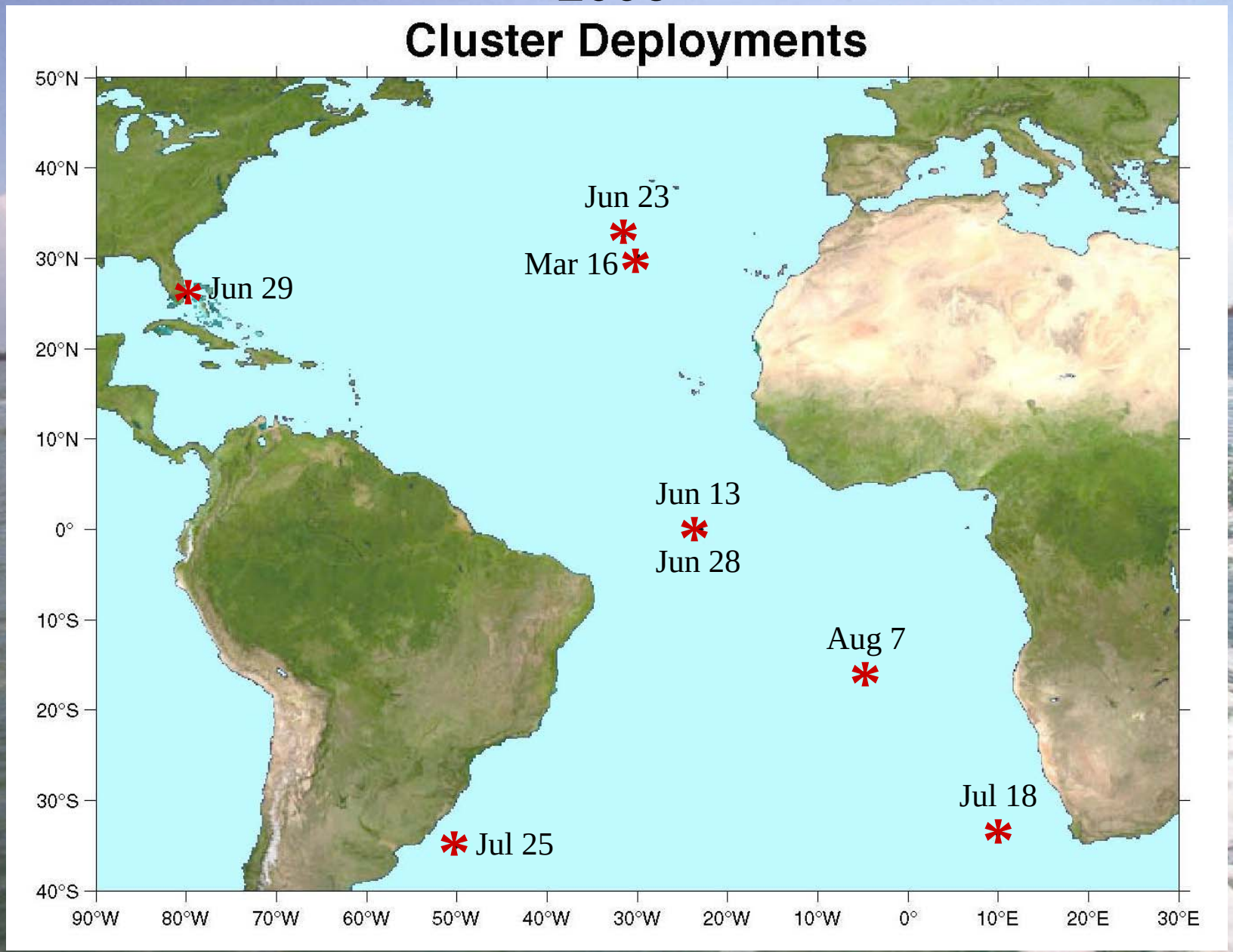
- The SVP drifters with mini drogue were deployed as clusters in open ocean regions of the Atlantic Ocean.

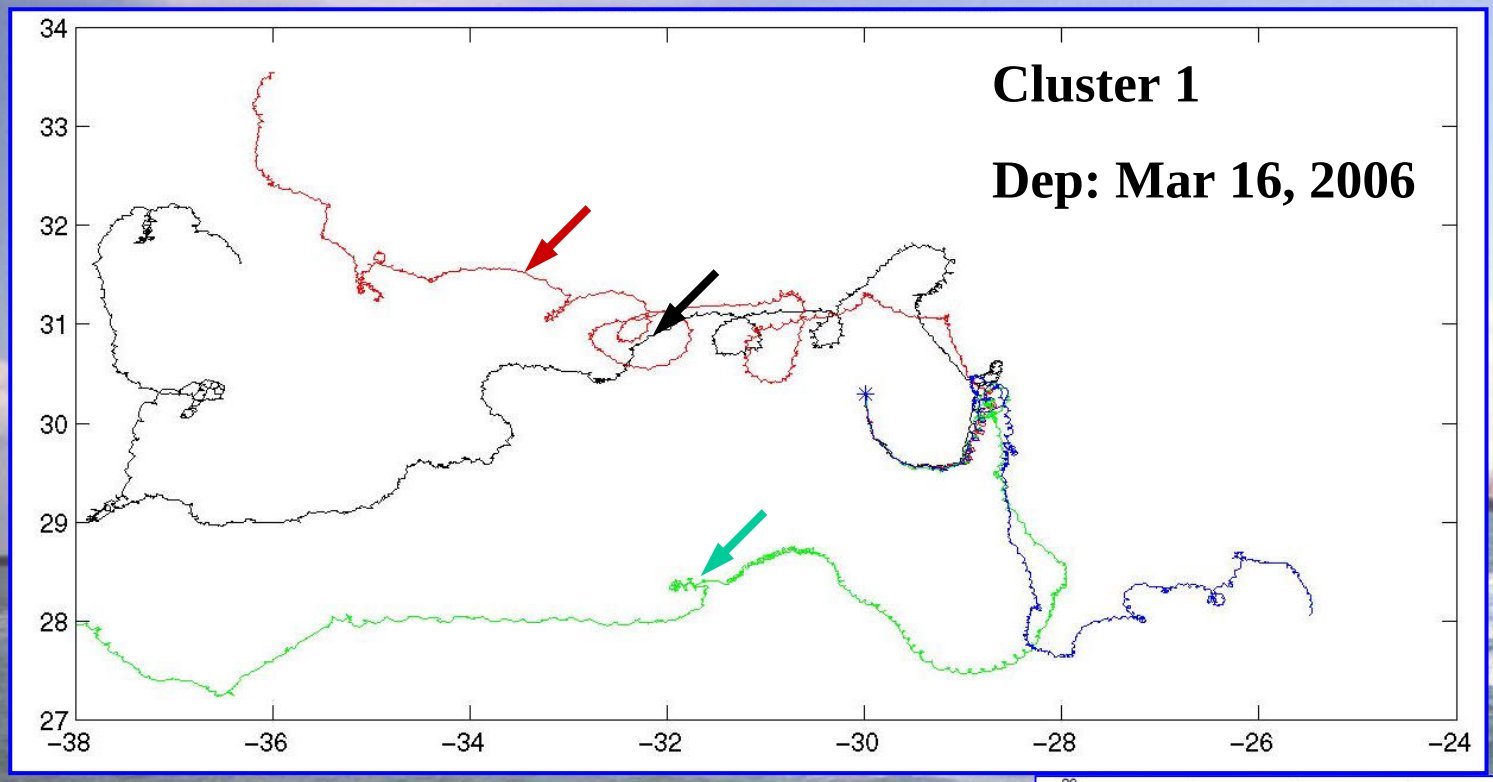
- As done last year, each cluster consisted of four drifters, one from each manufacturer: Clearwater, Metocean, Pacific Gyre, Technocean.

- Drifters were activated before deployment, deployed in close proximity and within minutes of each other.

- Eight clusters of ADB drifters were deployed in the Atlantic Ocean in 2006.

2006


Cluster Deployments
50°N
40°N
30°N
20°N
10°N
0°
10°S
20°S
30°S
40°S
90°W
80°W
70°W
60°W
50°W
40°W
30°W
20°W
10°W
0°
10°E
20°E
30°E
Jun 23
Mar 16
Jun 29
Jun 13
Jun 28
Aug 7
Jul 18
Jul 25

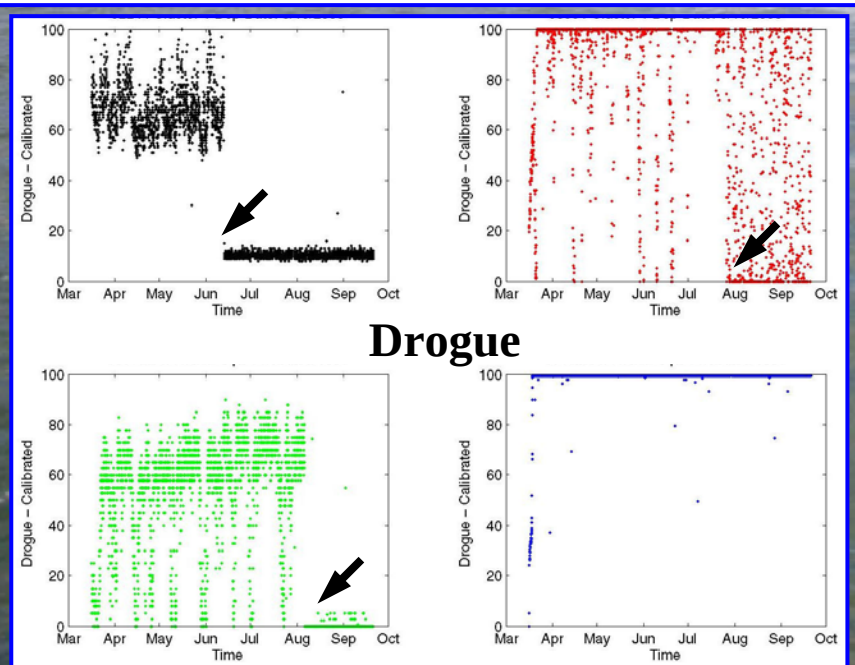


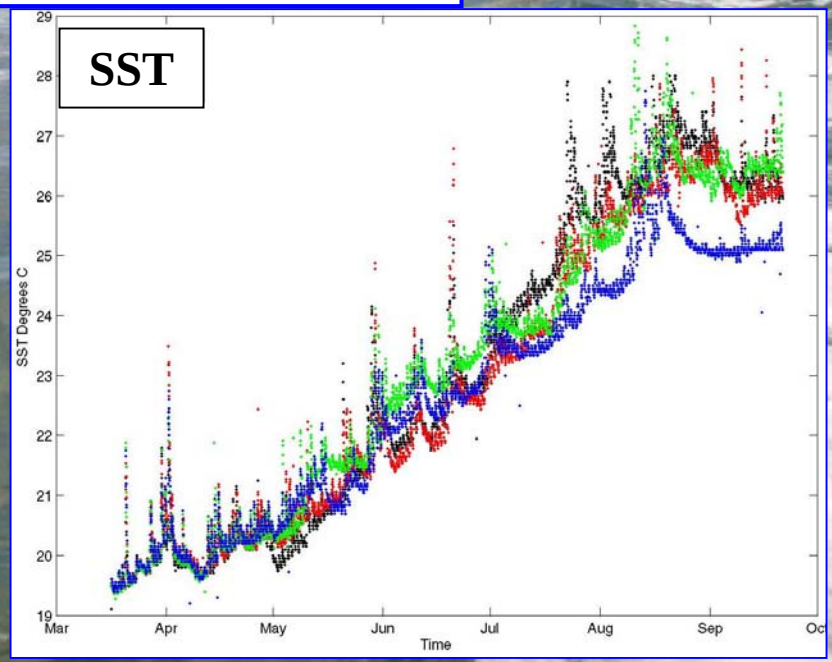
-- Clearwater

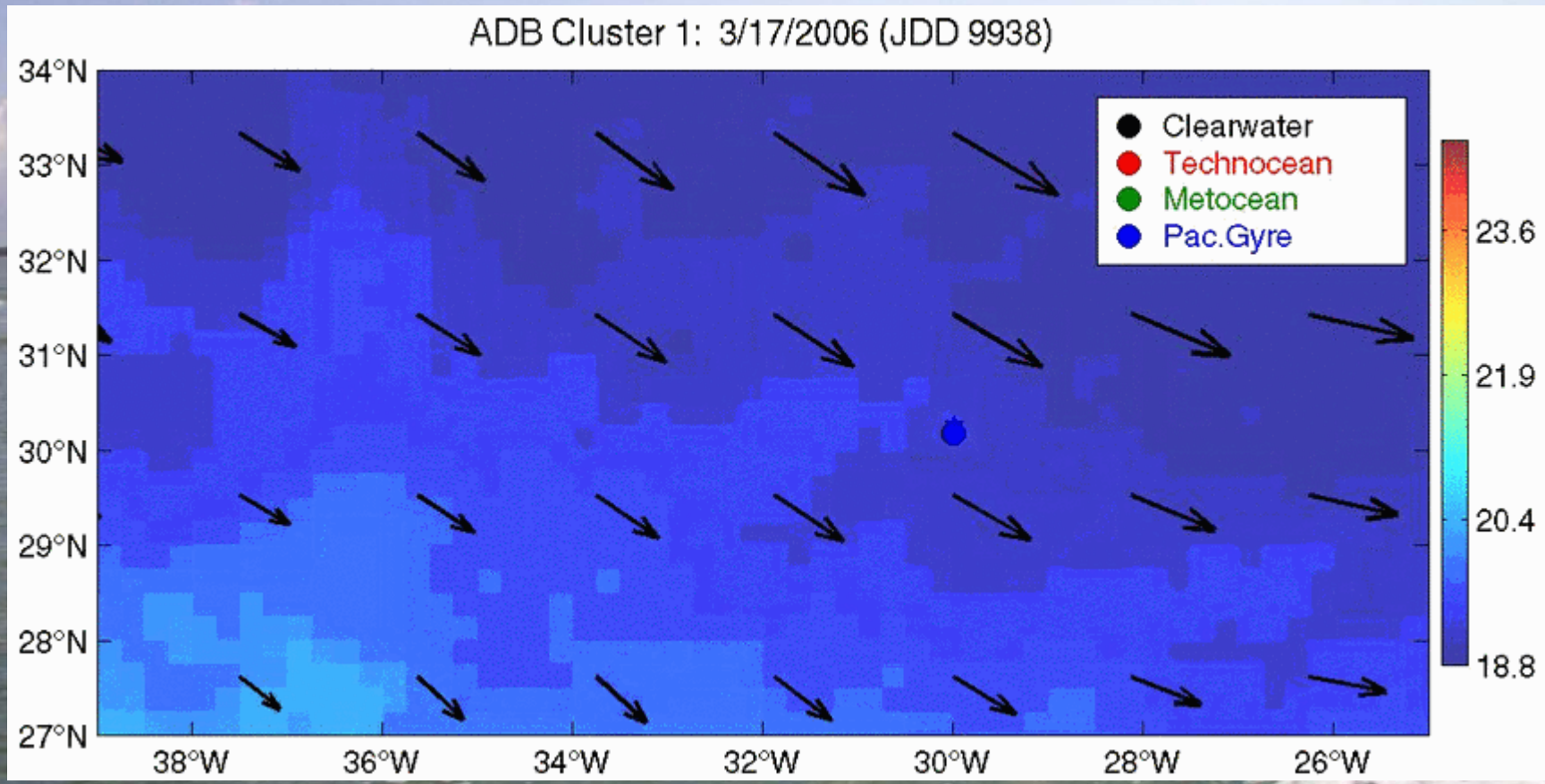
--Technocean

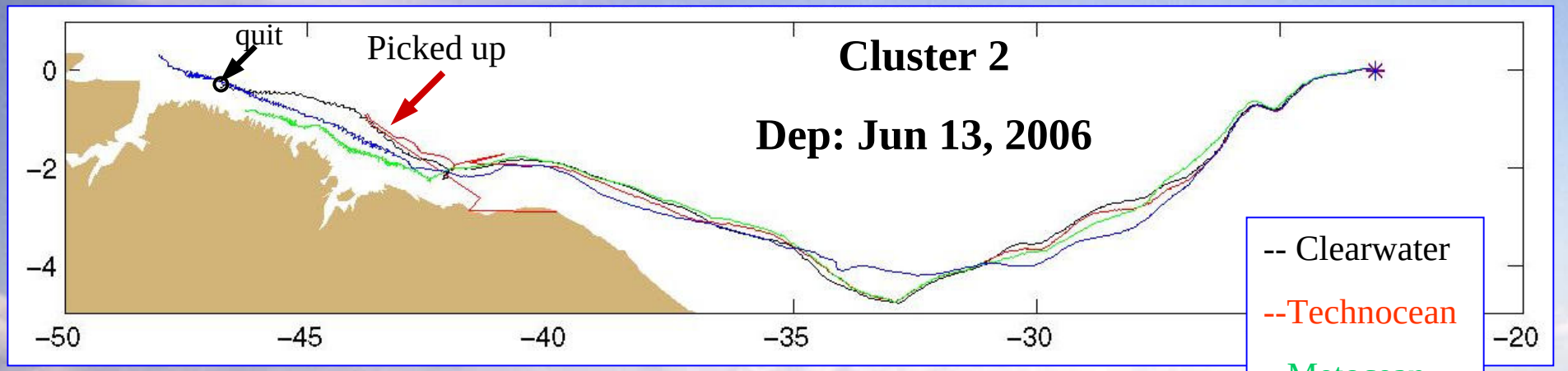
--Metocean

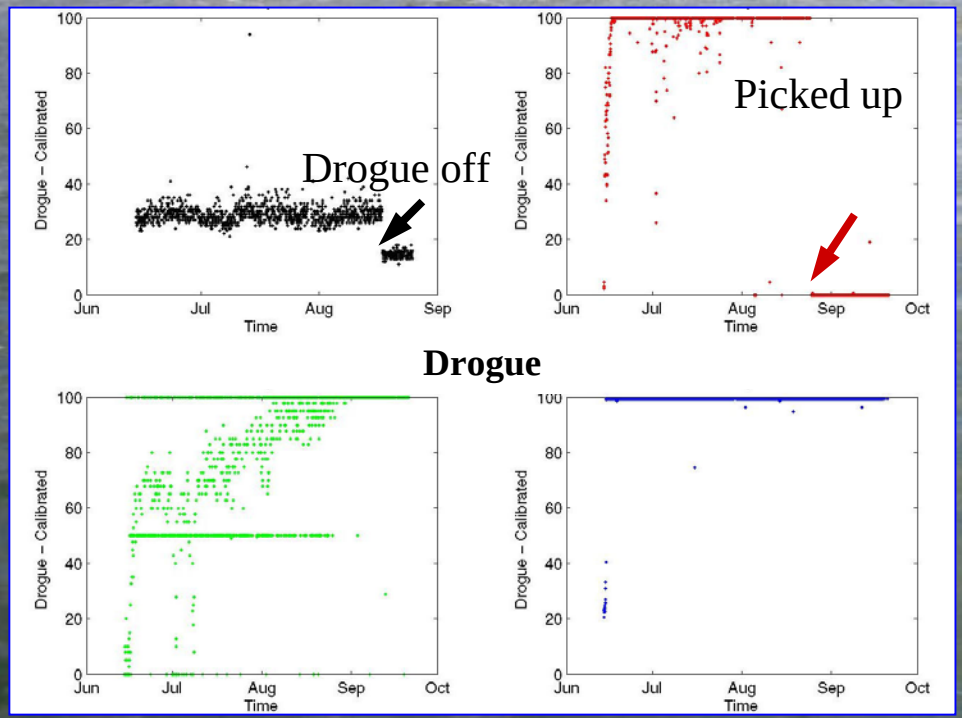
--Pacific Gyre

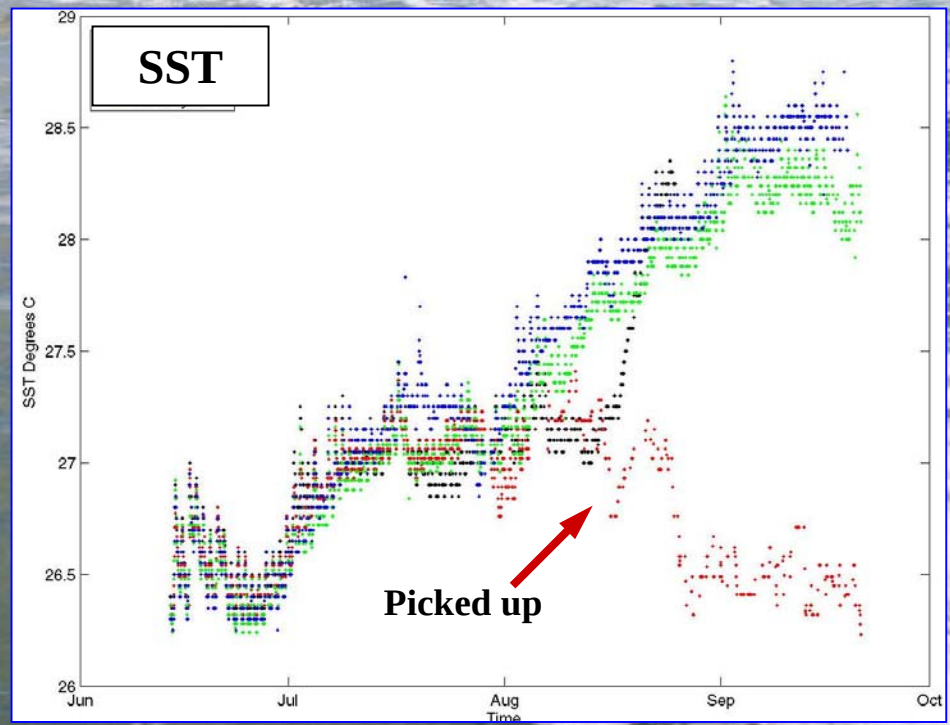


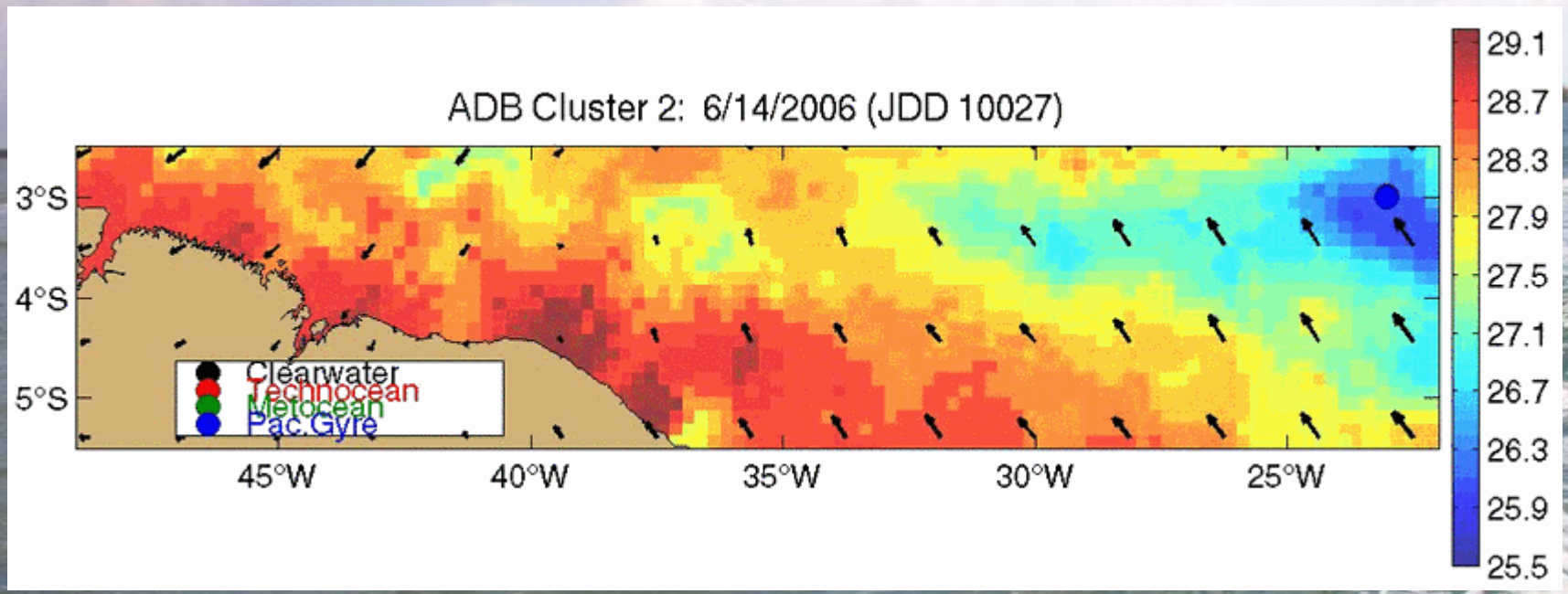



ADB Cluster 1: 3/17/2006 (JDD 9938)
34°N
33°N
32°N
31°N
30°N
29°N
28°N
27°N
38°W
36°W
34°W
32°W
30°W
28°W
26°W
Clearwater
Technocean
Metocean
Pac.Gyre
23.6
21.9
20.4
18.8


quit
Picked up
Cluster 2
Dep: Jun 13, 2006
0
−2
−4
−50
−45
−40
−35
−30
−20
-- Clearwater
--Technocean
--Metocean
--Pacific Gyre

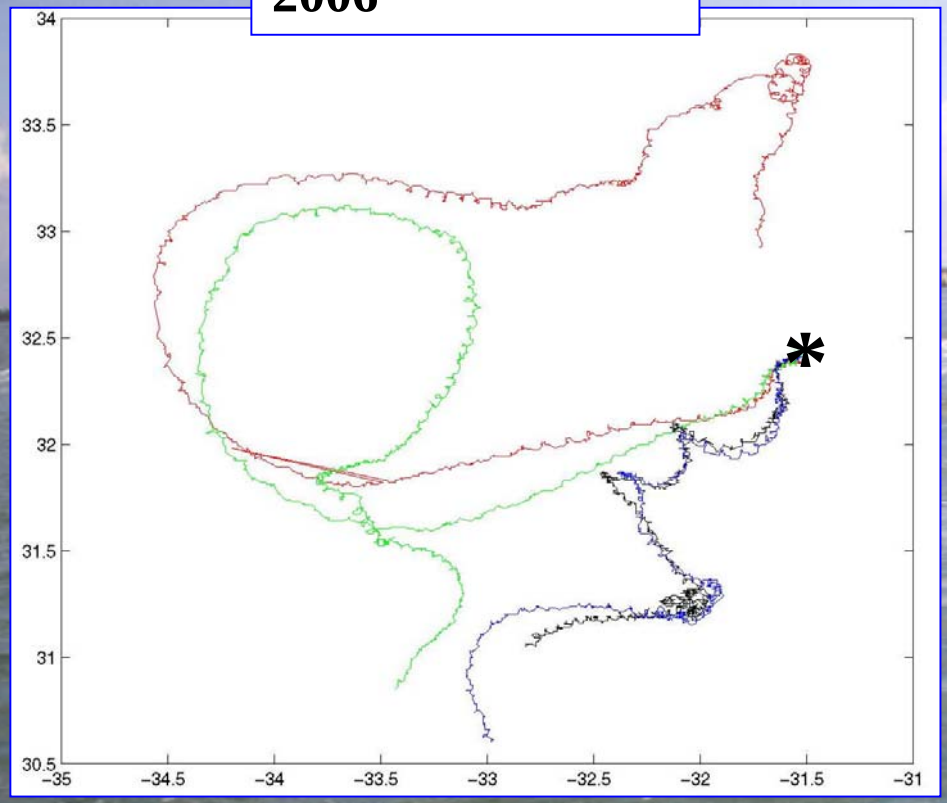

Drogue off
Picked up
Drogue
Drogue – Calibrated
Time
Jun
Jul
Aug
Sep
Oct


SST
SST Degrees C
Picked up
Time
Jun
Jul
Aug
Sep
Oct


ADB Cluster 2: 6/14/2006 (JDD 10027)
3°S
4°S
5°S
45°W
40°W
35°W
30°W
25°W
Clearwater
Technocean
Metocean
Pac.Gyre
29.1
28.7
28.3
27.9
27.5
27.1
26.7
26.3
25.9
25.5

Cluster 3

Dep: Jun 23, 2006

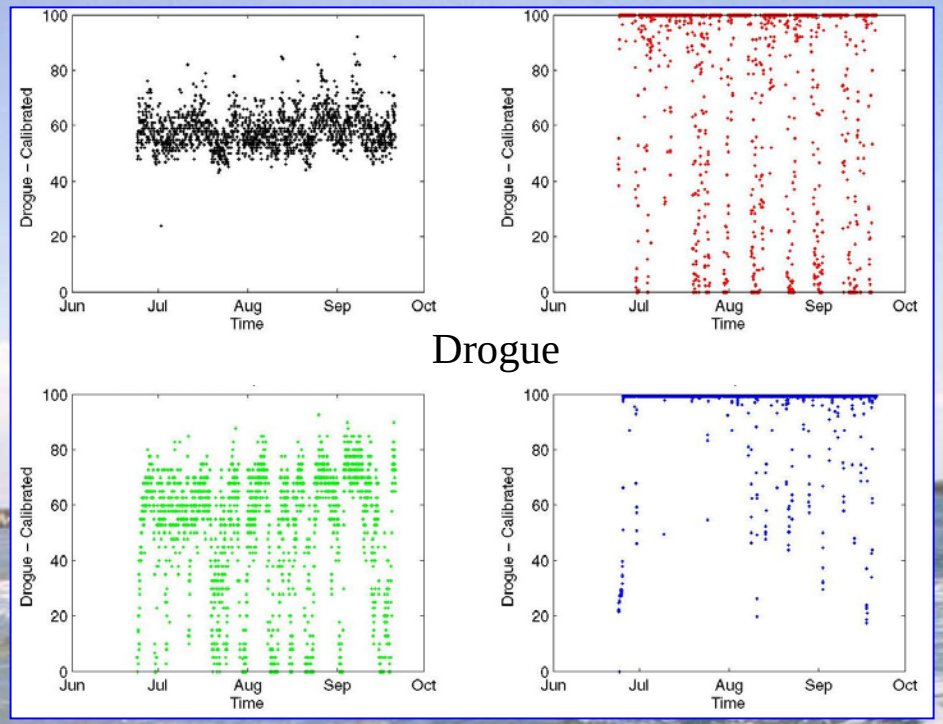


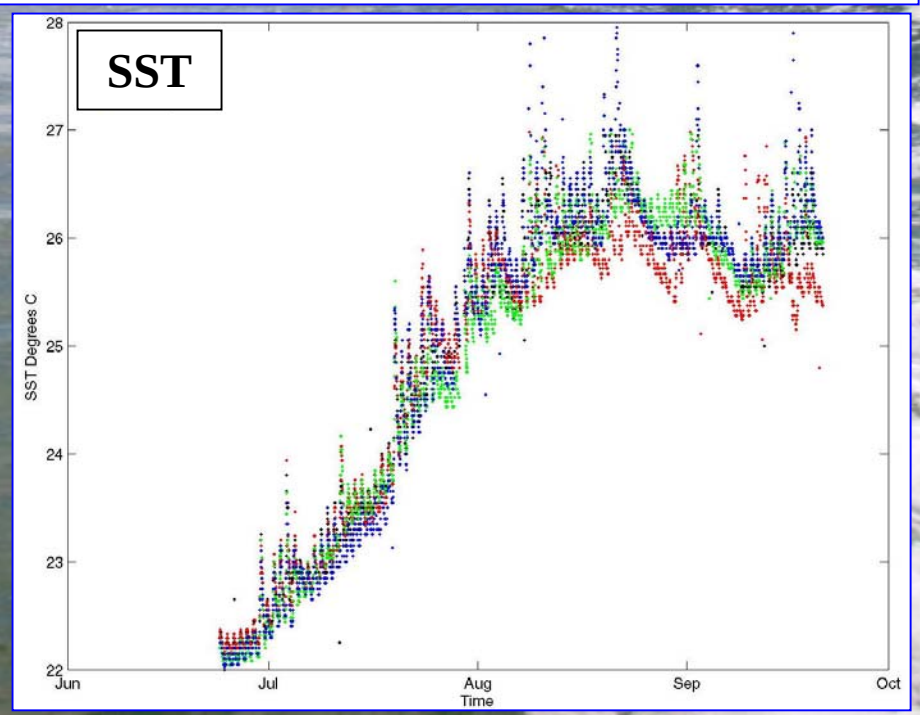
-- Clearwater

--Technocean

--Metocean

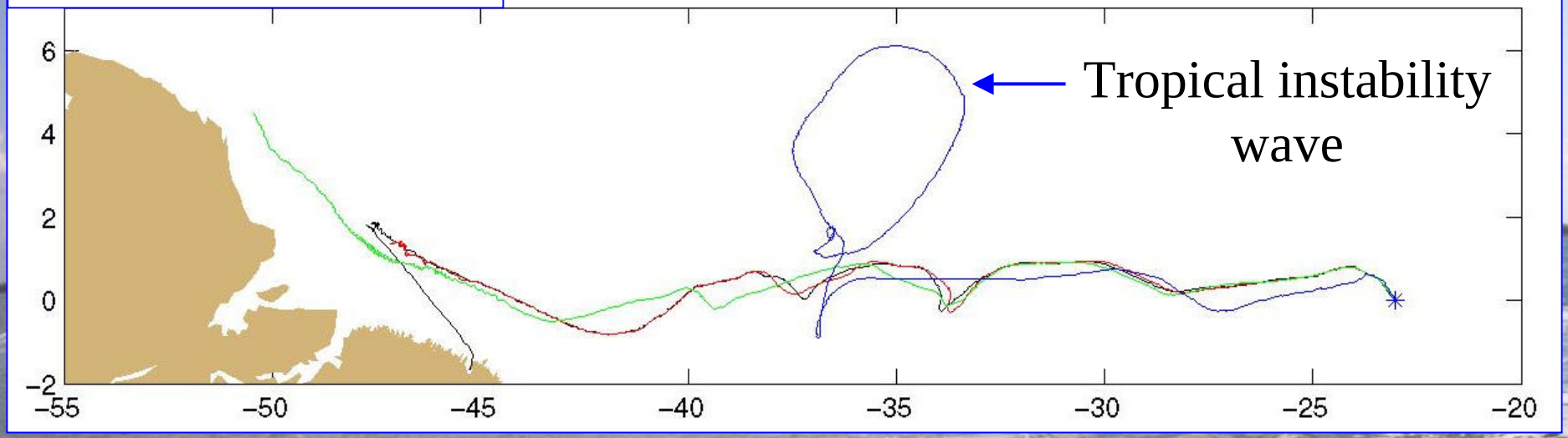
--Pacific Gyre

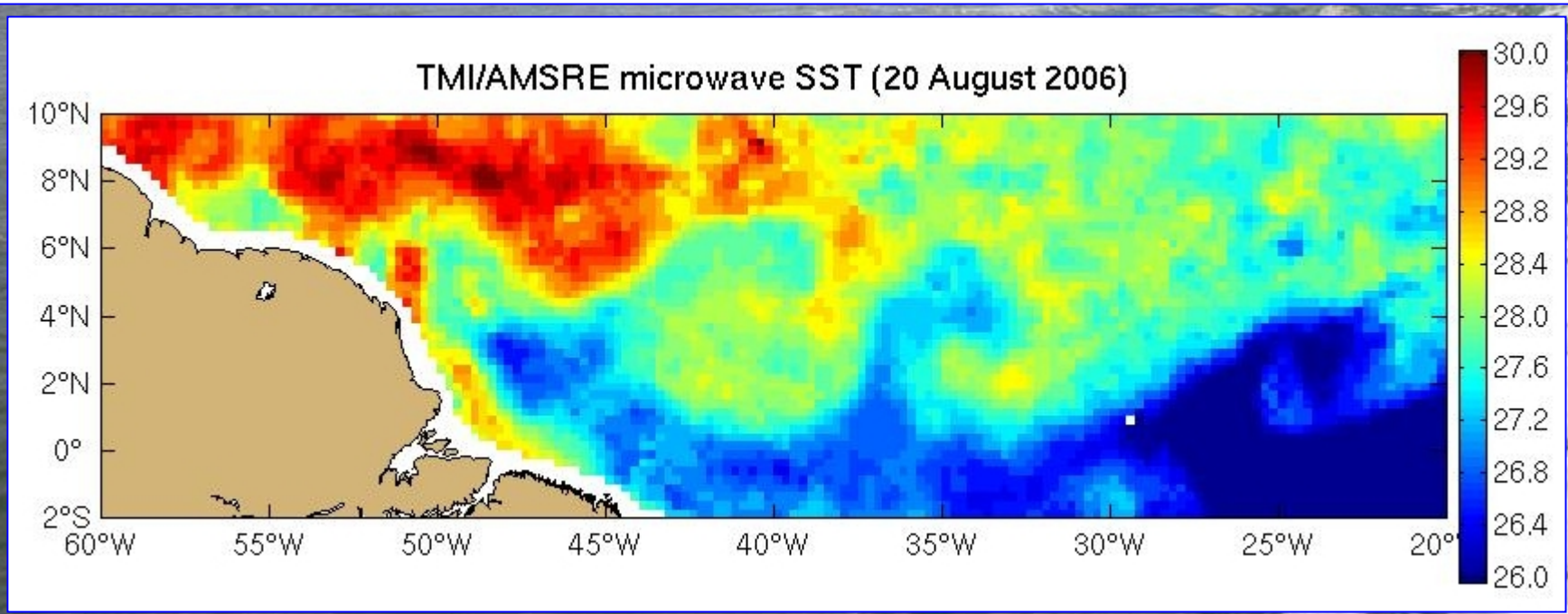


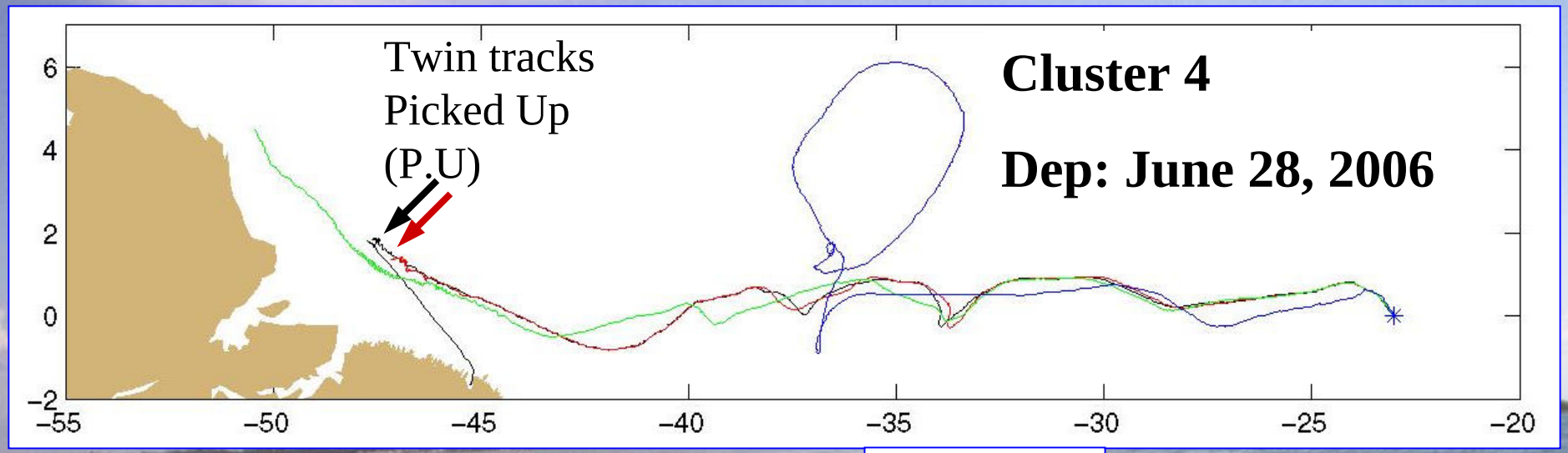


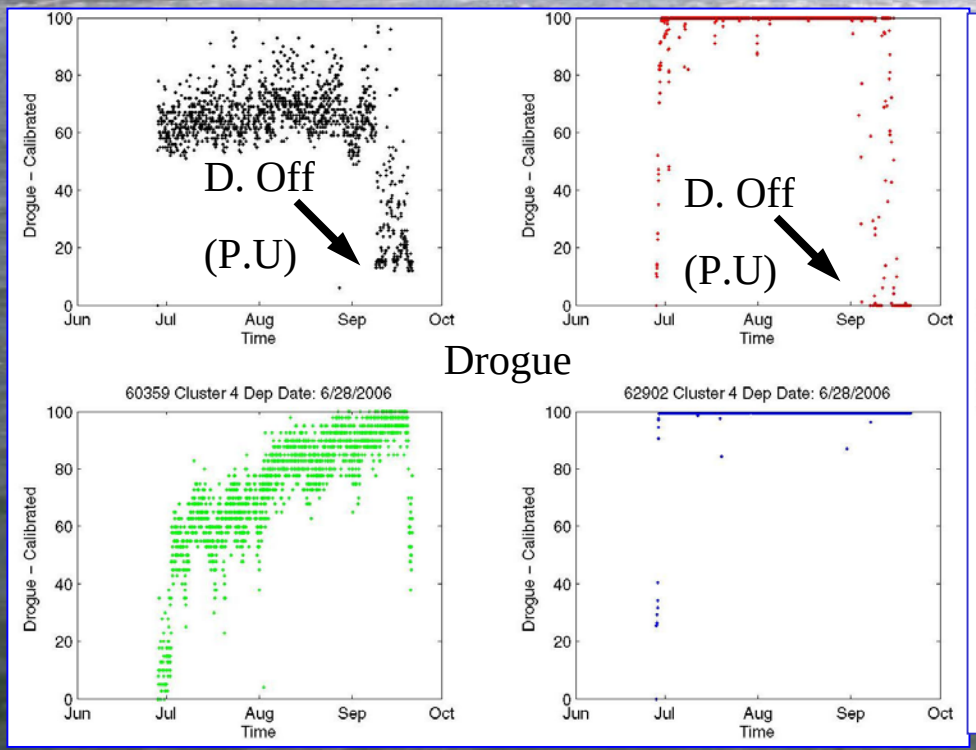
Cluster 4

Dep: Jun 28, 2006







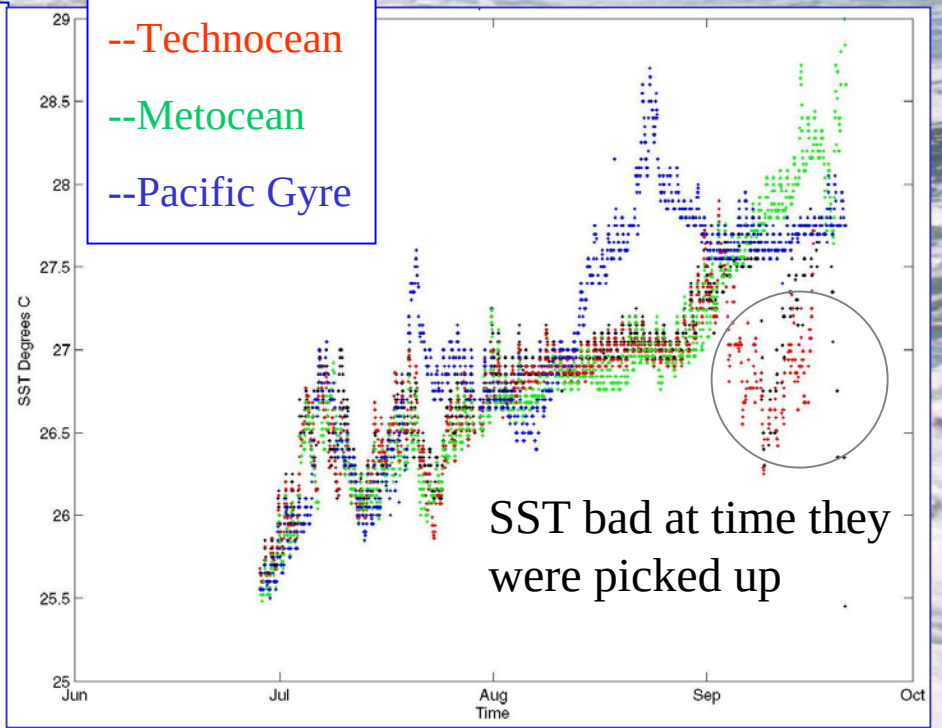


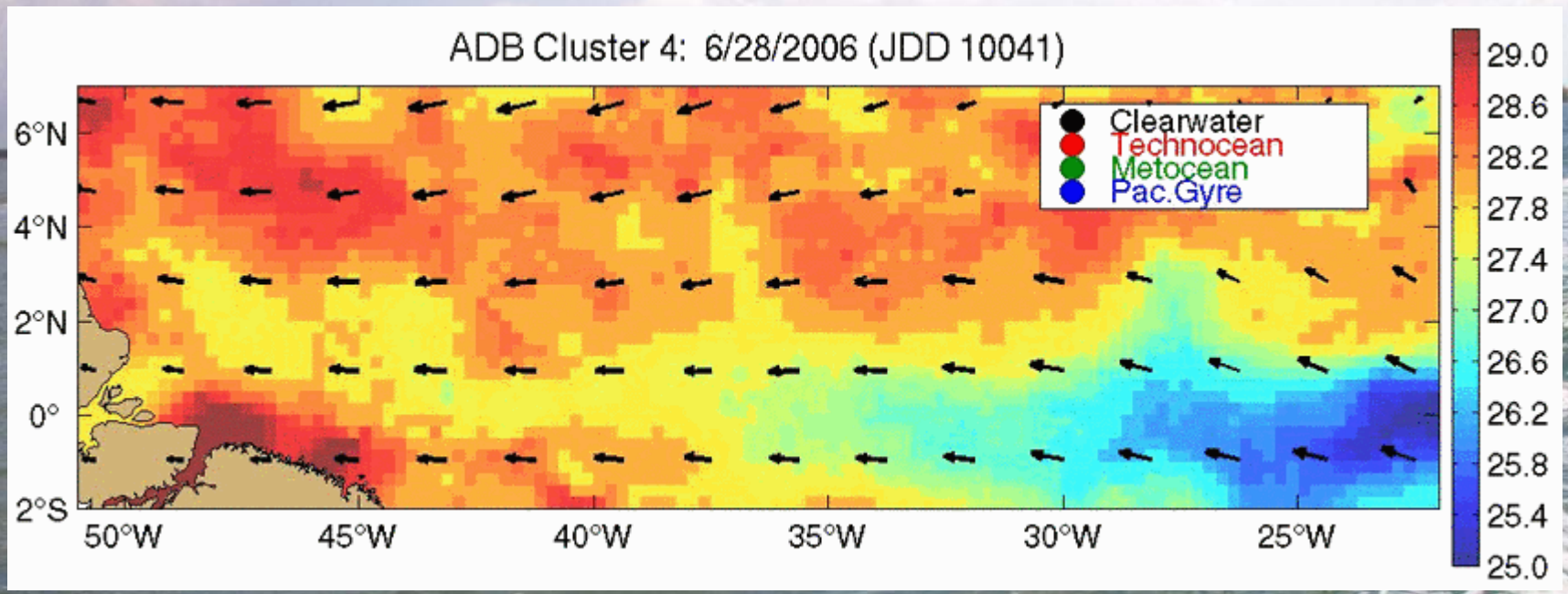
-- Clearwater

--Technocean

--Metocean

--Pacific Gyre




ADB Cluster 4: 6/28/2006 (JDD 10041)
Clearwater
Technocean
Metocean
Pac.Gyre
6°N
4°N
2°N
0°
2°S
50°W
45°W
40°W
35°W
30°W
25°W
29.0
28.6
28.2
27.8
27.4
27.0
26.6
26.2
25.8
25.4
25.0

Deployment of Cluster 5 by AOML drifter group

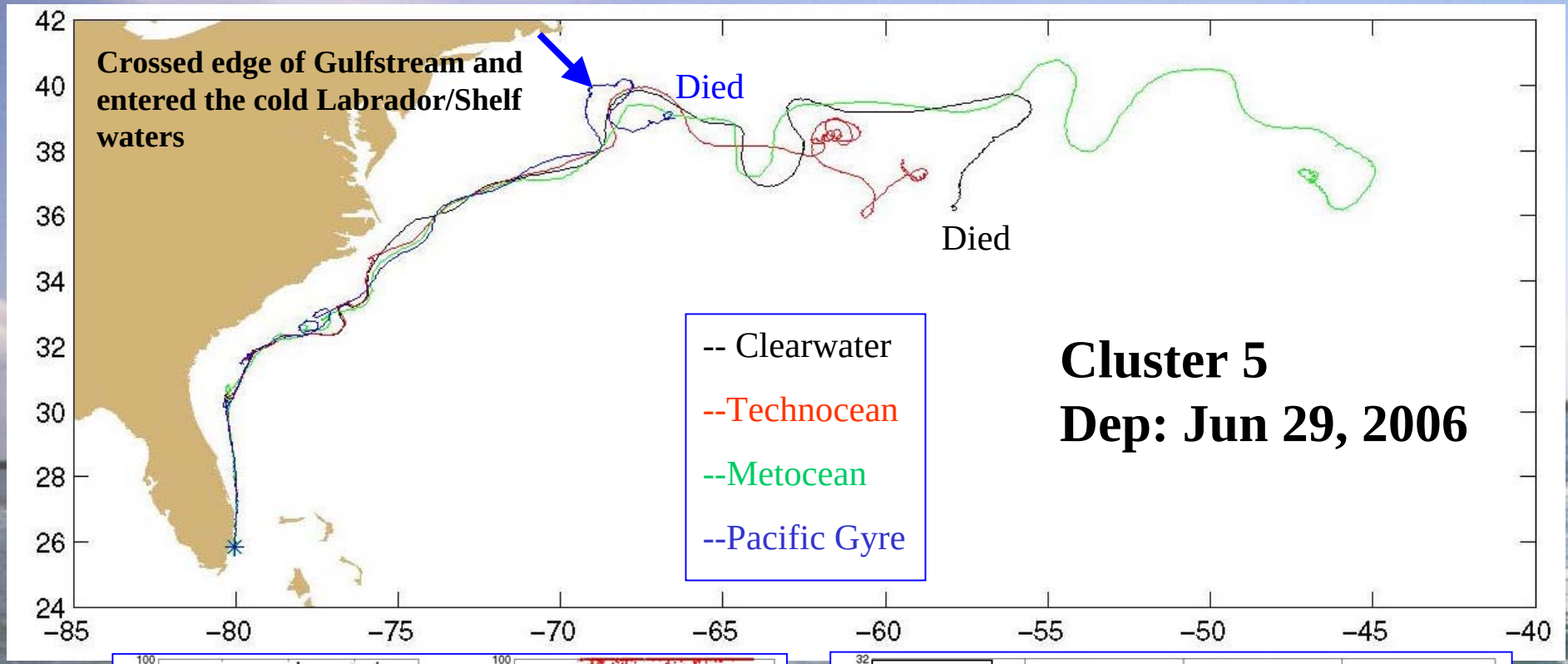
Miss Britt

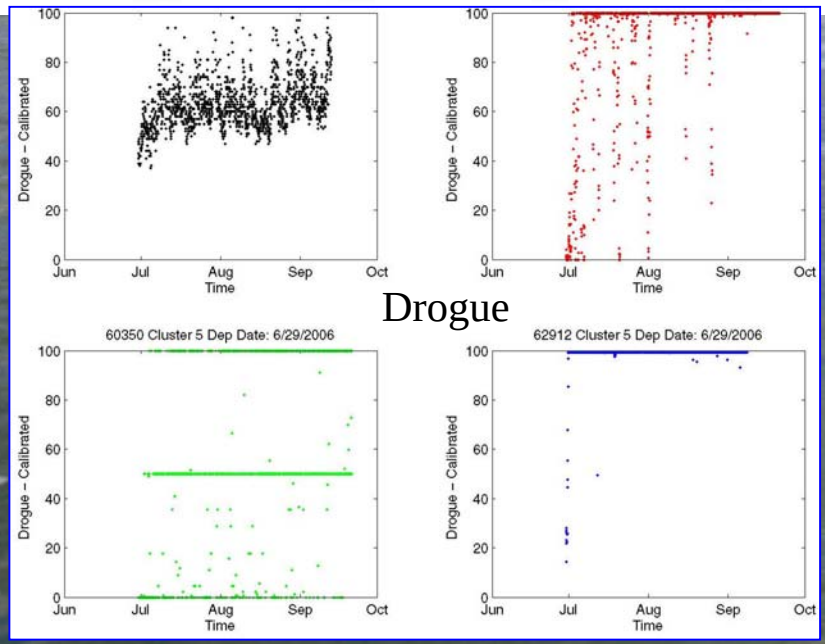
Drifters handled with care

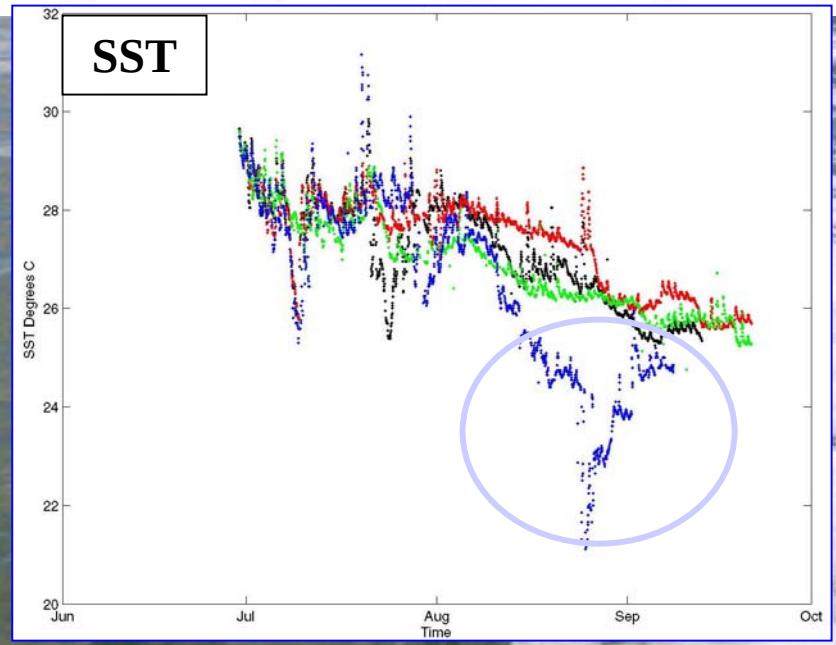
Magnets removed

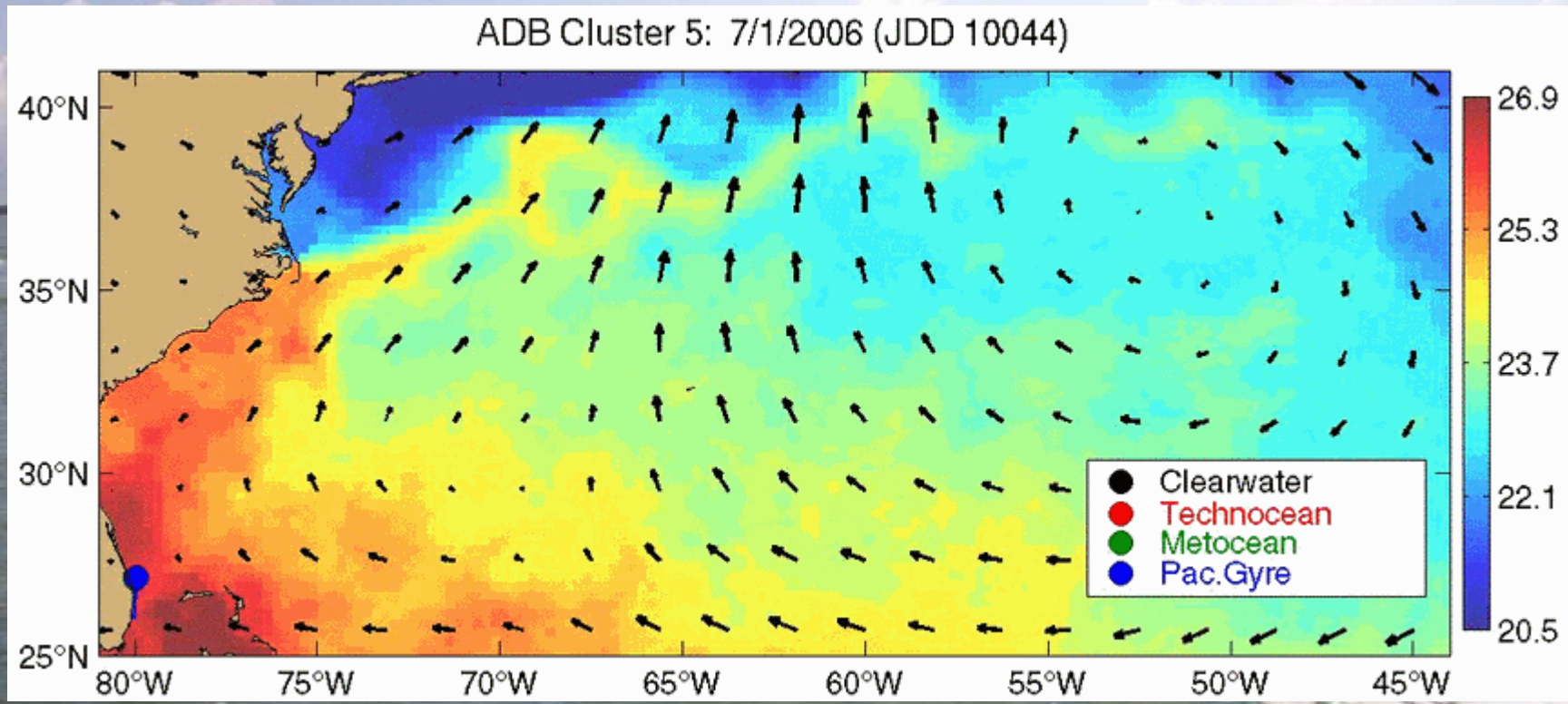
Listening for signal

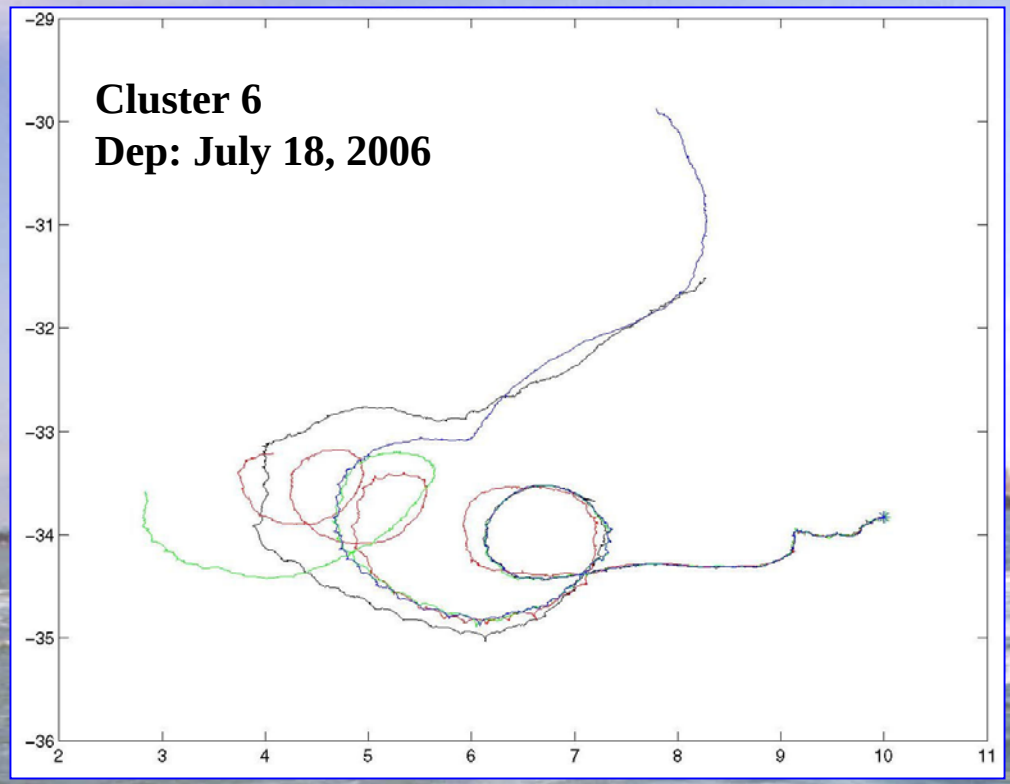
Drifter in water


Crossed edge of Gulfstream and entered the cold Labrador/Shelf waters
Died
Died
-- Clearwater
--Technocean
--Metocean
--Pacific Gyre
Cluster 5
Dep: Jun 29, 2006
42
40
38
36
34
32
30
28
26
24
−85
−80
−75
−70
−65
−60
−55
−50
−45
−40


Drogue – Calibrated
Time
Jun
Jul
Aug
Sep
Oct
Drogue
60350 Cluster 5 Dep Date: 6/29/2006
62912 Cluster 5 Dep Date: 6/29/2006


SST
SST Degrees C
Time
Jun
Jul
Aug
Sep
Oct


ADB Cluster 5: 7/1/2006 (JDD 10044)
40°N
35°N
30°N
25°N
80°W
75°W
70°W
65°W
60°W
55°W
50°W
45°W
26.9
25.3
23.7
22.1
20.5
Clearwater
Technocean
Metocean
Pac.Gyre

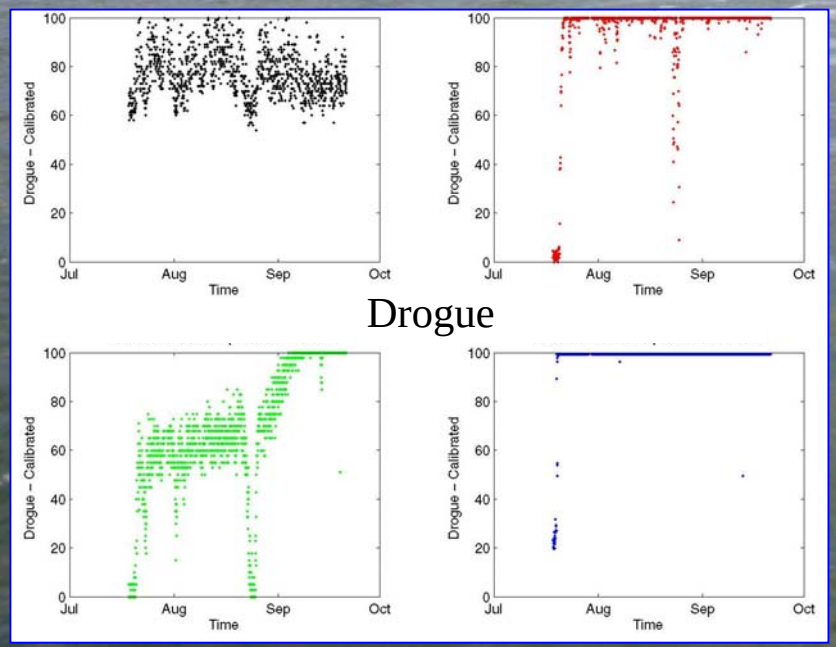


-- Clearwater

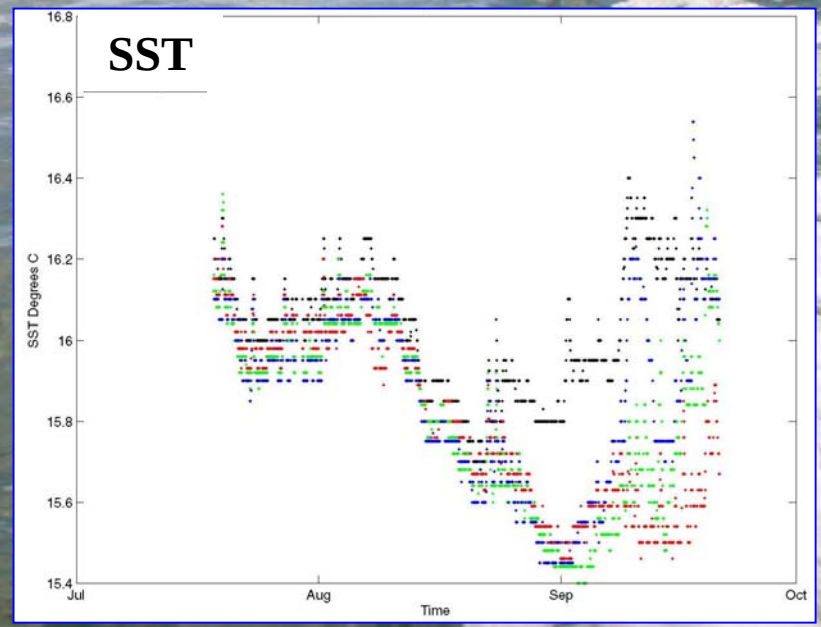
--Technocean

--Metocean

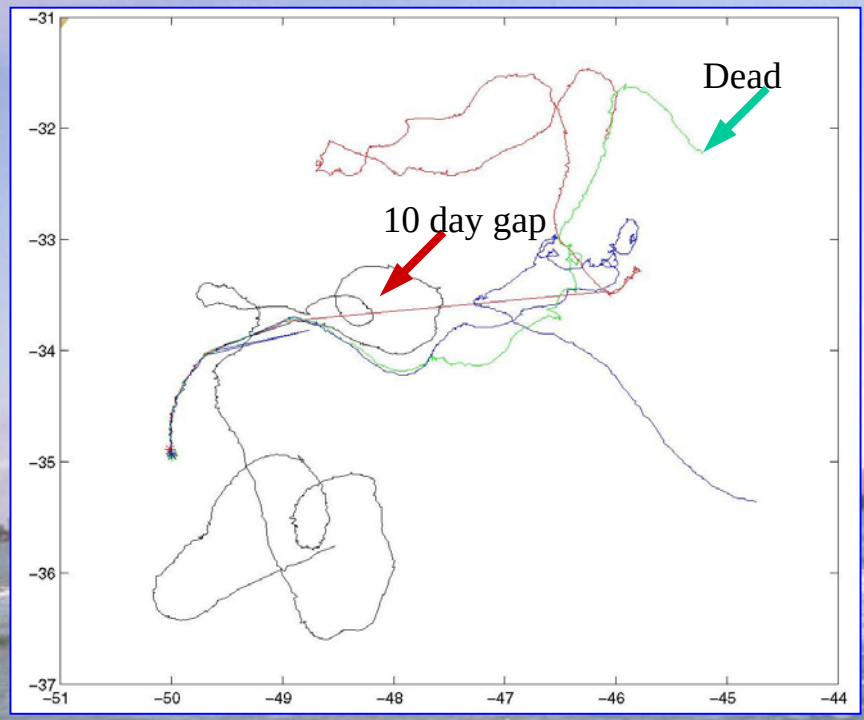
--Pacific Gyre



Drogue



Cluster 7
Dep: July 25, 2006

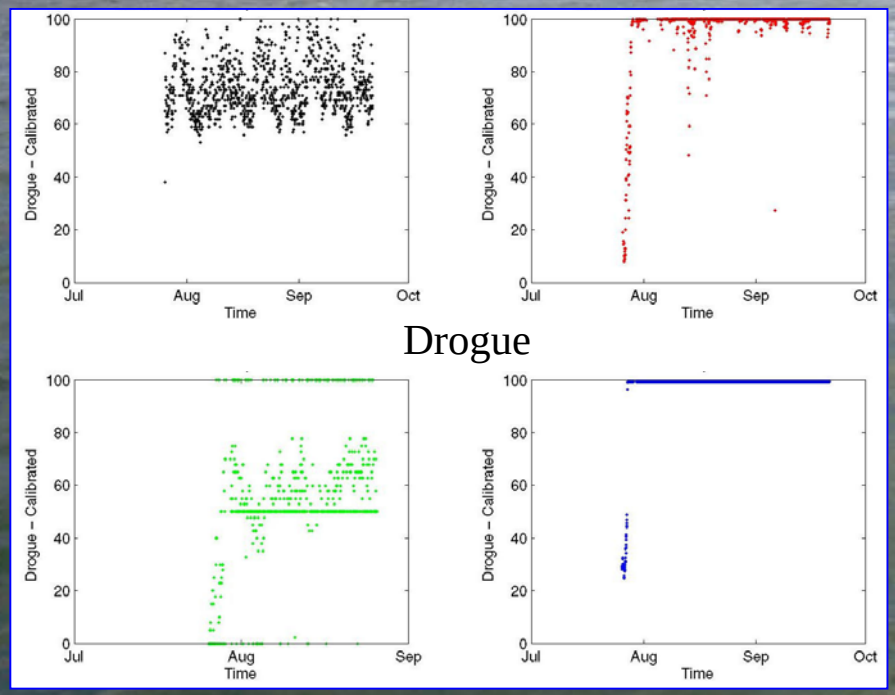


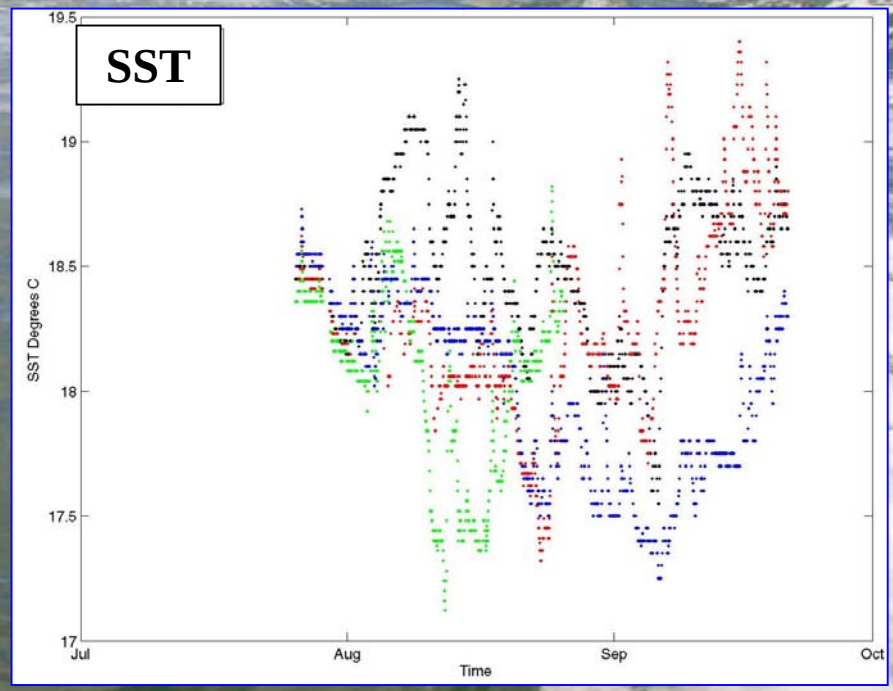
-- Clearwater

--Technocean

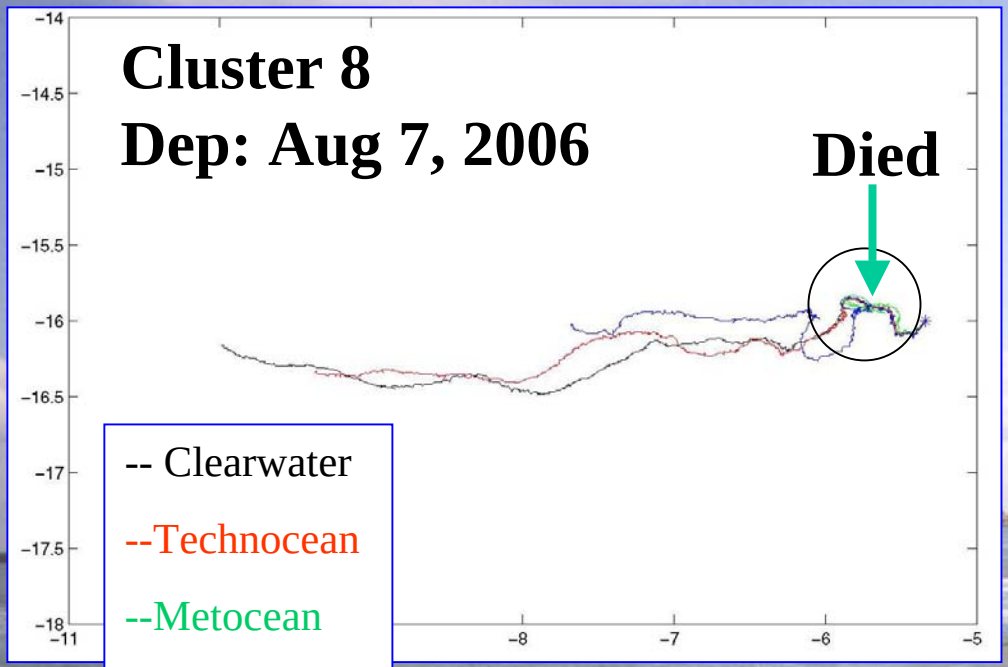
--Metocean

--Pacific Gyre

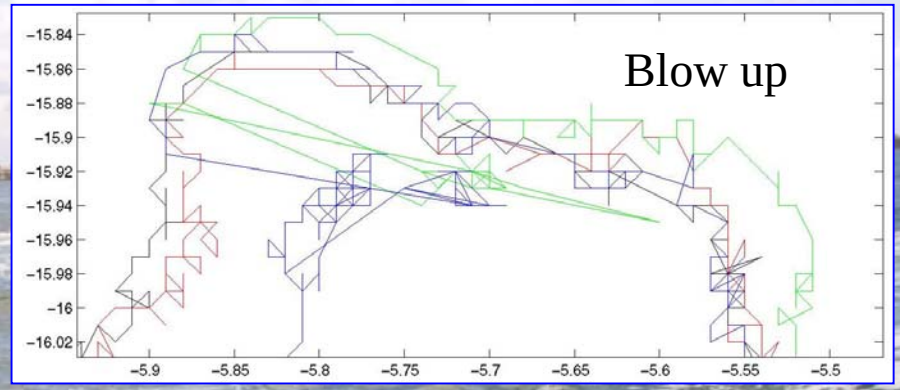


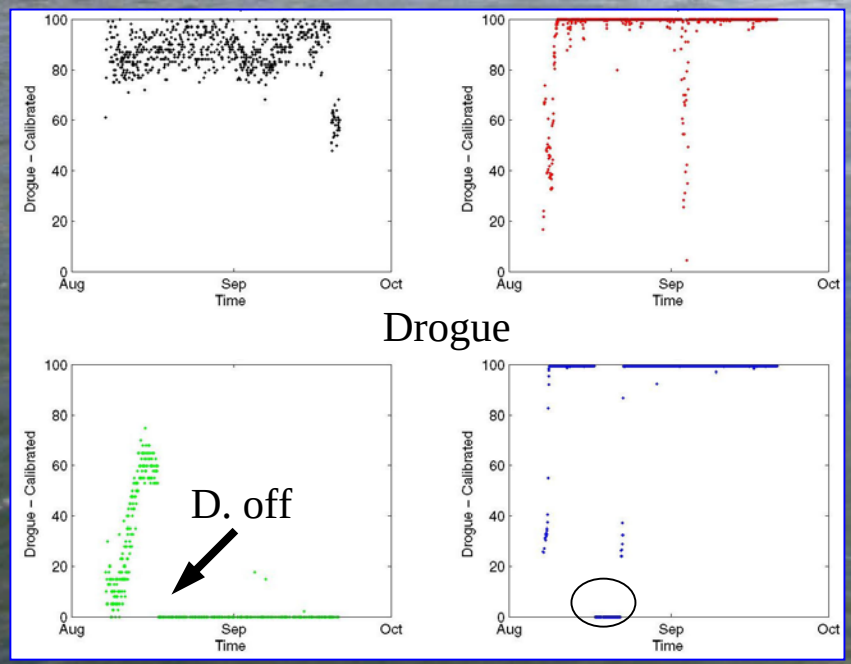


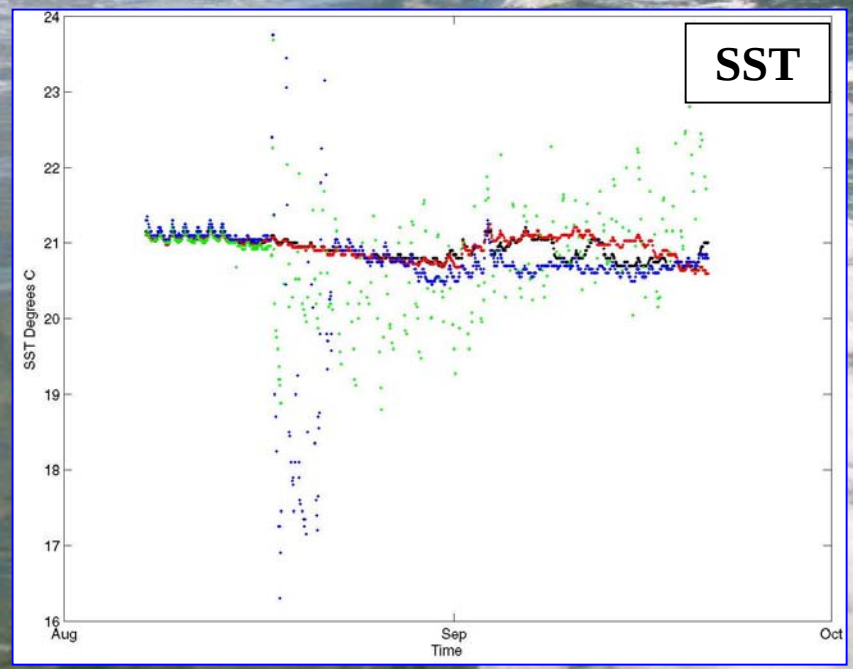
Cluster 8
Dep: Aug 7, 2006



We concluded that Metocean & PacGyre drifters were picked up, then redeployed. Metocean drifter may have been damaged, because no more positions were obtained, even after placing the buoy in ALP.



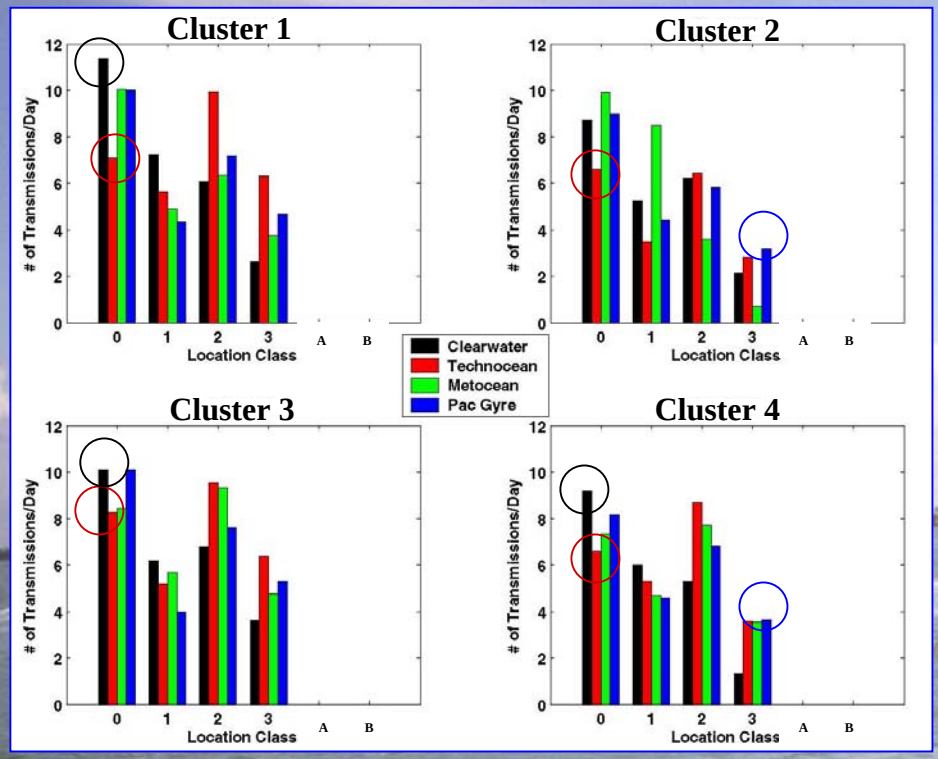


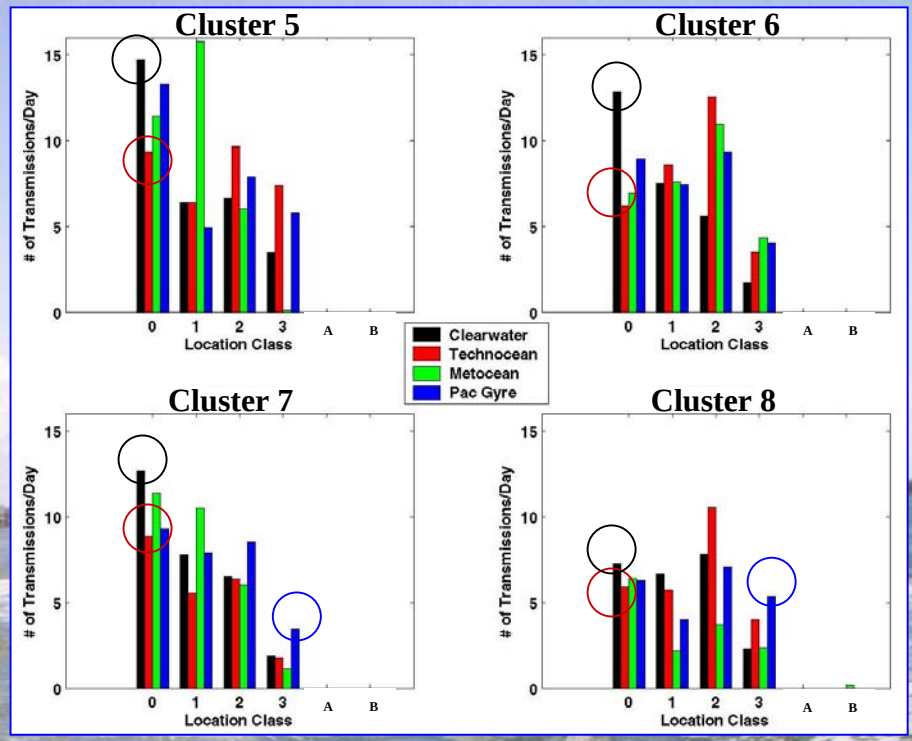


Number of Transmissions Per Day Location Classes

- Argos locations are calculated from all messages received during a satellite pass over a transmitter.
- Standard locations are calculated on reception of four or more messages.
- Auxiliary Location Processing (ALP) also receive locations calculated from two (A) or three messages (B).
- Each location is assigned to a location class. The classes vary according to the estimated accuracy of the location, for standard locations.

(from the Argos User's manual)





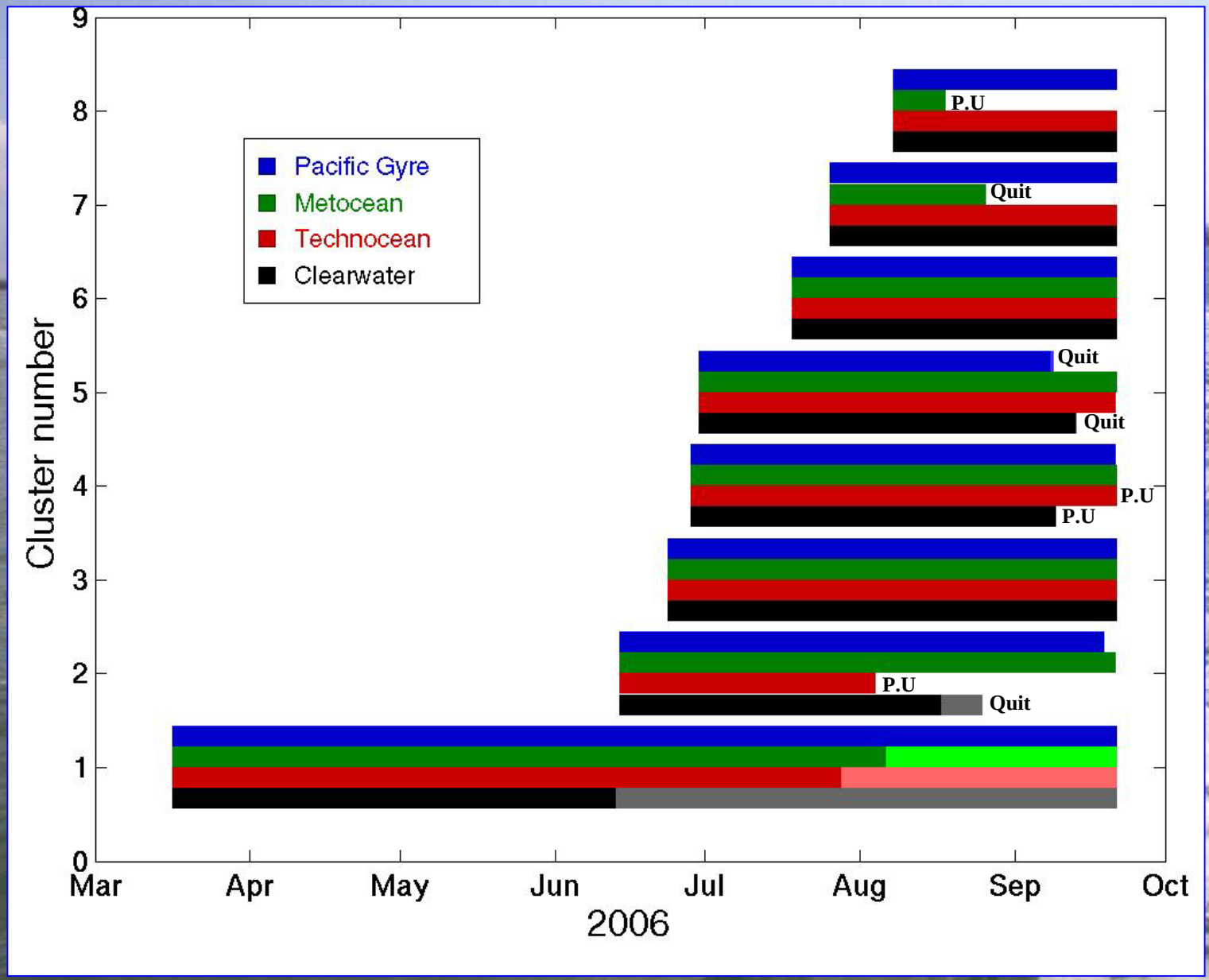
- **Pacific Gyre has the most class 3 locations in several clusters (# 2, 4, 7, 8)**

- **Technocean has the least # of class 0's in all clusters, with more class 2-3 (most class 3's in clusters 1, 3, 5).**

- **Clearwater has slightly higher class 0 LC in all clusters except cluster 2.**

Class	Estimated Accuracy in latitude and longitude
3	< 150 m
2	150 m <=accuracy < 350 m
1	350 m <=accuracy <1000 m

Transmitter and drogue life times ADB2006



Summary Table of Transmitter's Life Times

Clusters

Manufacturers	1	2	3	4	5	6	7	8
Clearwater	*	72 (Quit)	*	73 (P.U)	75 (Quit)	*	*	*
Technocean	*	51 (P.U)	*	73 (P.U)	*	*	*	*
Metocean	*	*	*	*	*	*	31 (Quit)	10 (P.U)
Pacific Gyre	*	*	*	*	70 (Quit)	*	*	*
Max # Days	**189**	**99**	**90**	**85**	**83**	**65**	**57**	**45**

*** OK until last update, September 21, 2006**

Summary Table of Drogue's Life Times

Clusters

Manufacturers	1	2	3	4	5	6	7	8
Clearwater	88	64	*	73* (P.U)	75* (Quit)	*	*	*
Technocean	133	51* (P.U)	*	73* (P.U)	*	*	*	*
Metocean	142	*	*	*	*	*	31* (Quit)	10* (P.U)
Pacific Gyre	*	*	*	*	70* (Quit)	*	*	*
Max # Days	**189**	**99**	**90**	**85**	**83**	**65**	**57**	**45**

*** OK until it died or last update, September 21, 2006**


Improvements in the 2006 Study

Improvements in packaging, handling and deployment of drifters

- All manufacturers used similar packaging.
- Technocean reverted to wired rope radial design, to extend drogue life
- Metocean attached deployment instructions directly to surface float.
- Pacific Gyre installed carrying handles.

Improvements in all other areas

- **All deployments were successful, *no* drifters failed on deployment.**
- **Only 4 drifters have quit transmitting as of September 21, 2006.**
- **Only 4 drifters have lost their drogues before transmitter quit.**
- **All SSTs from neighboring drifters seem to be consistent with each other.**
- **Transmission problems have been resolved: only 1 10-day gap found in one drifter, which is not a concern.**

Conclusions

This study shows how important communication has been between manufacturers and buoy operators.

Manufacturers responded quickly and diligently to problems found in last year's study, and fixed them.

We plan to maintain active communication with manufacturers to address any problems that may arise.

No ADB study is planned at this time for 2007.

Thank You

2005 ADB Packaging

2006 ADB standardized packaging

Deployment of Cluster 5 by AOML drifter group

Miss Britt

Drifters handled with care

Magnets removed

Listening for signal

Drifters in water