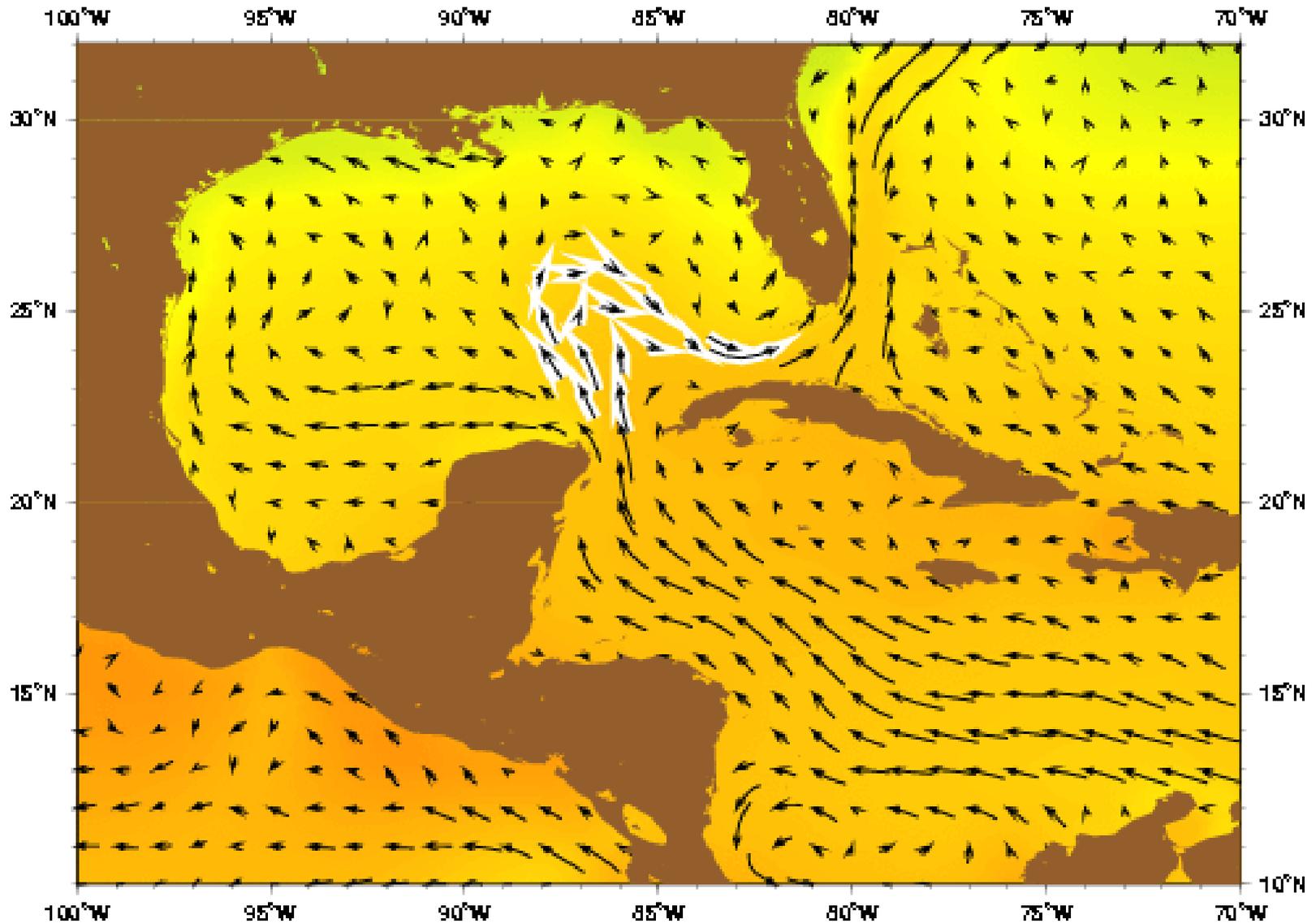


***Connectivity of the South Florida Coral Reef Ecosystem
To Upstream Waters of the Western Caribbean and
Gulf of Mexico***

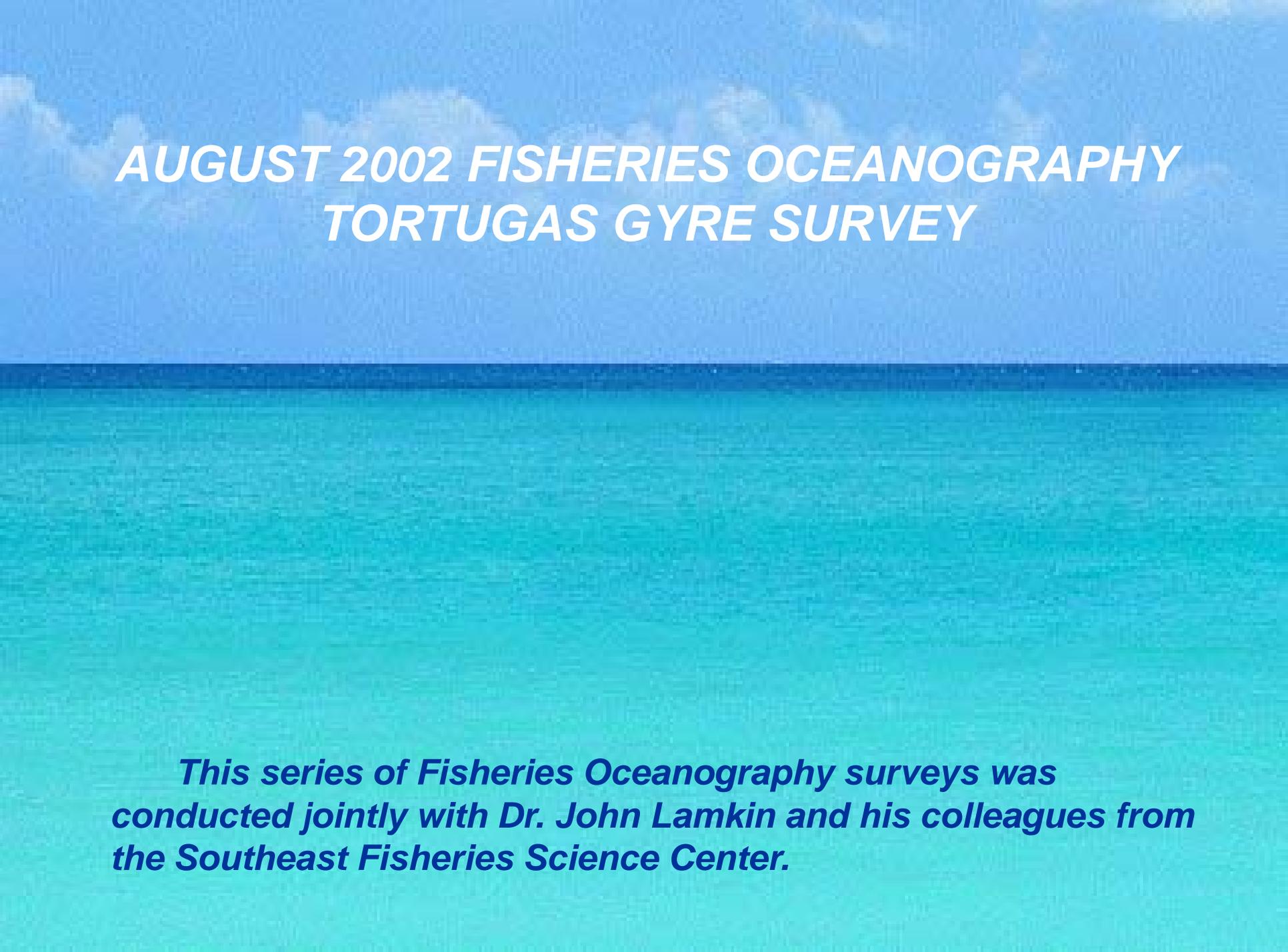
Dr. Libby Johns

***Physical Oceanography Division
Atlantic Oceanographic and Meteorological Laboratory
National Oceanic and Atmospheric Administration
Miami, FL
March 2008***

LOOP CURRENT SYSTEM



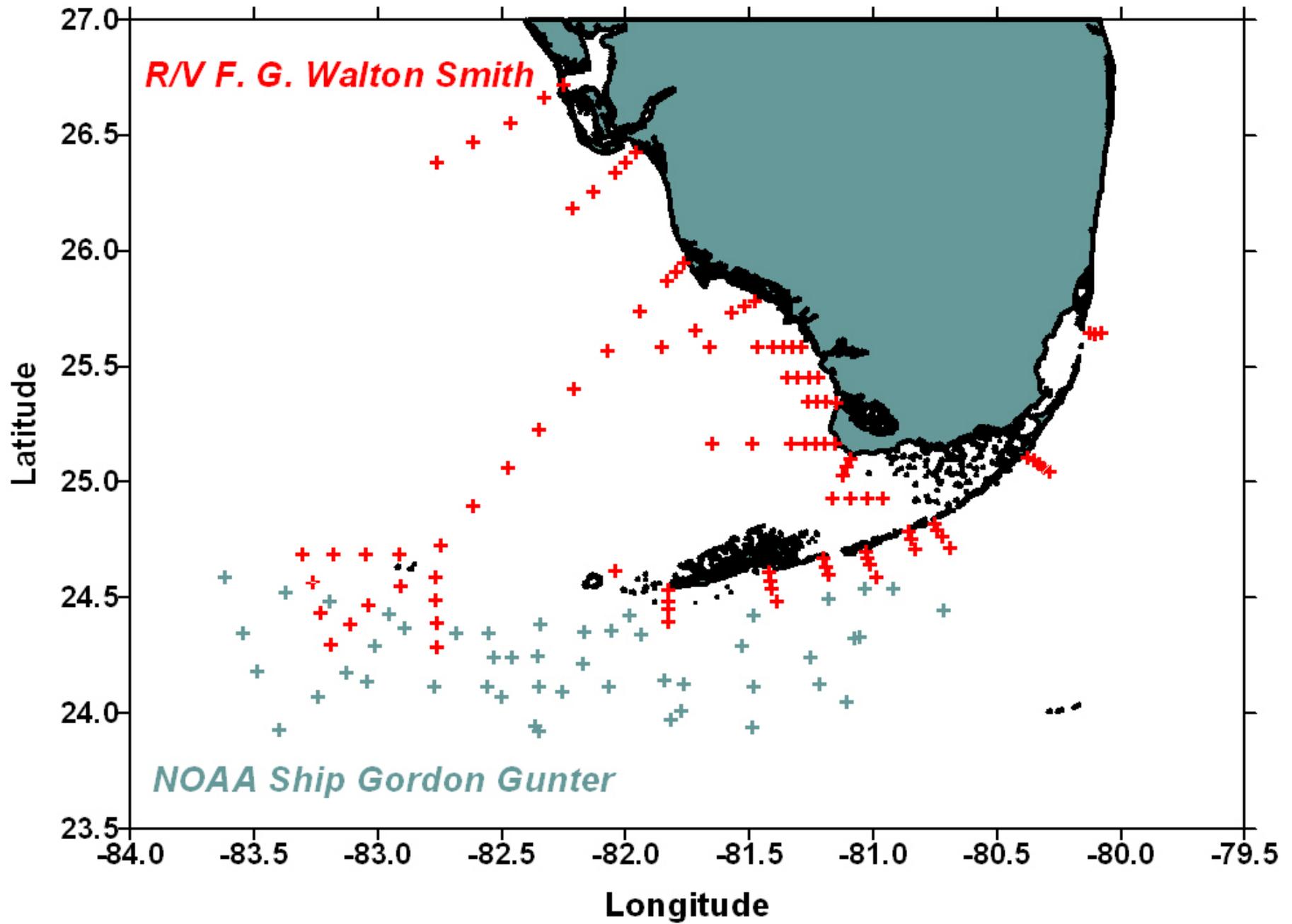
Mariano Global Surface Velocity Analysis (MGSVA)



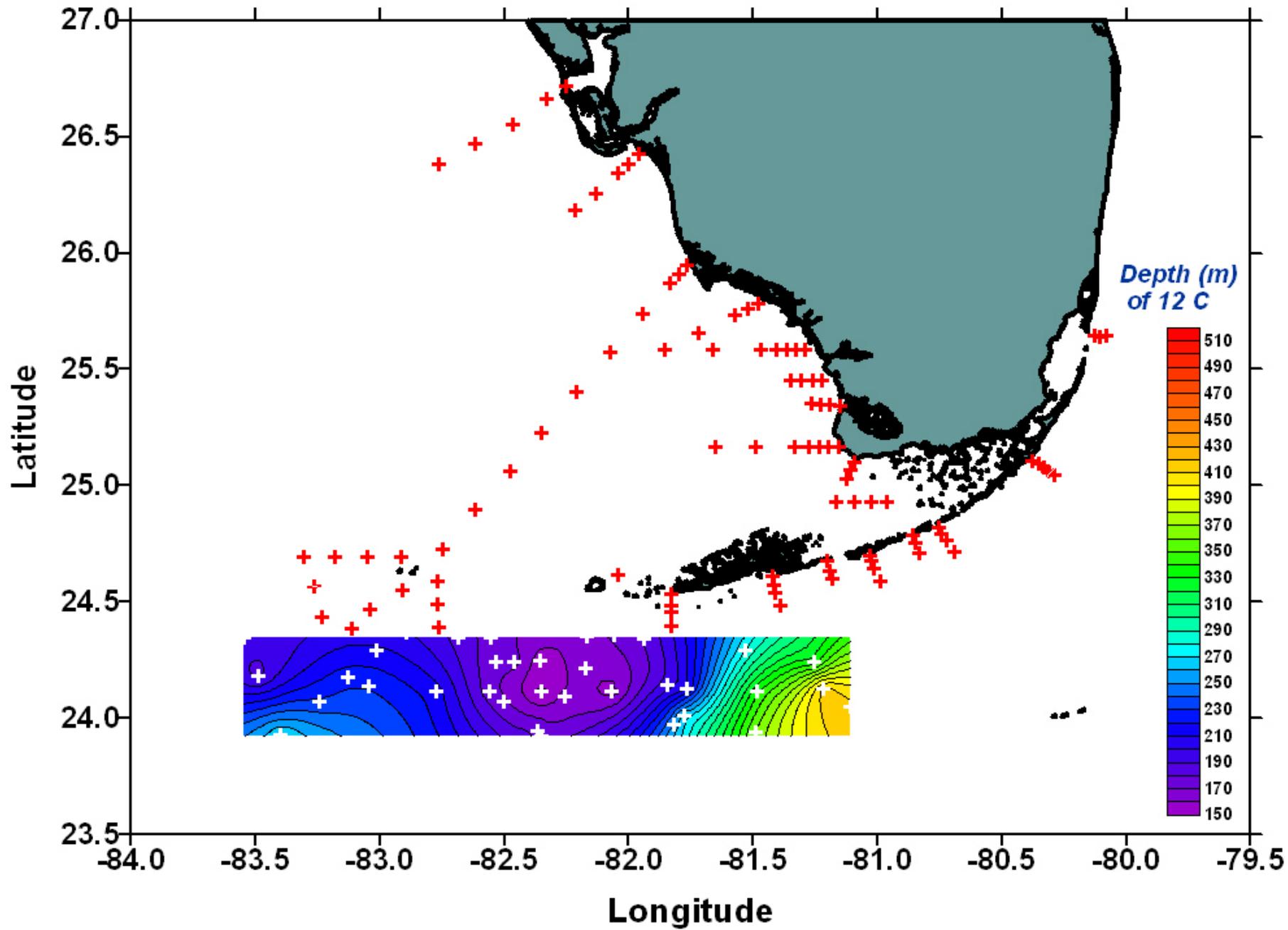
***AUGUST 2002 FISHERIES OCEANOGRAPHY
TORTUGAS GYRE SURVEY***

This series of Fisheries Oceanography surveys was conducted jointly with Dr. John Lamkin and his colleagues from the Southeast Fisheries Science Center.

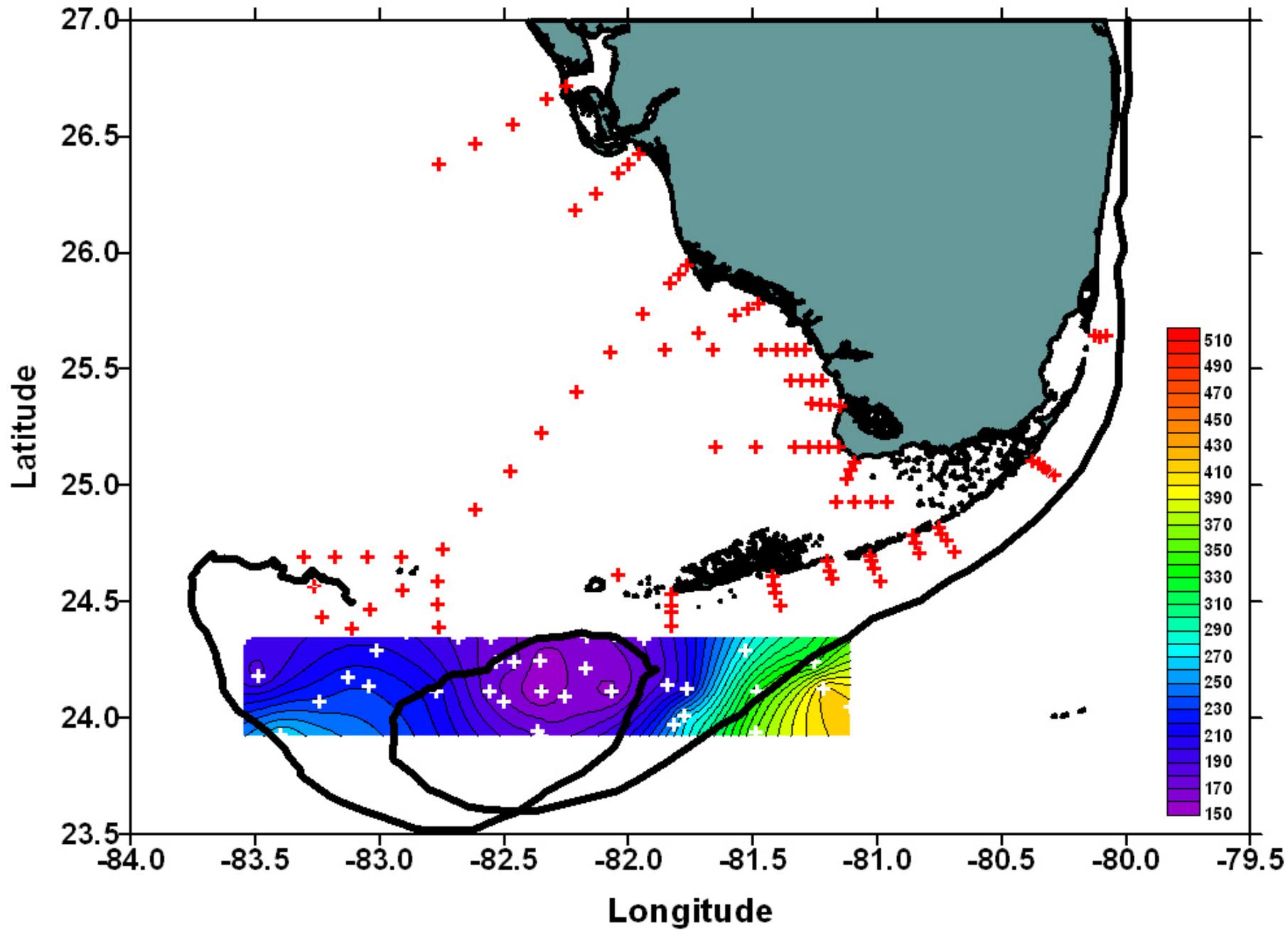
AUGUST 2002 STATION LOCATIONS



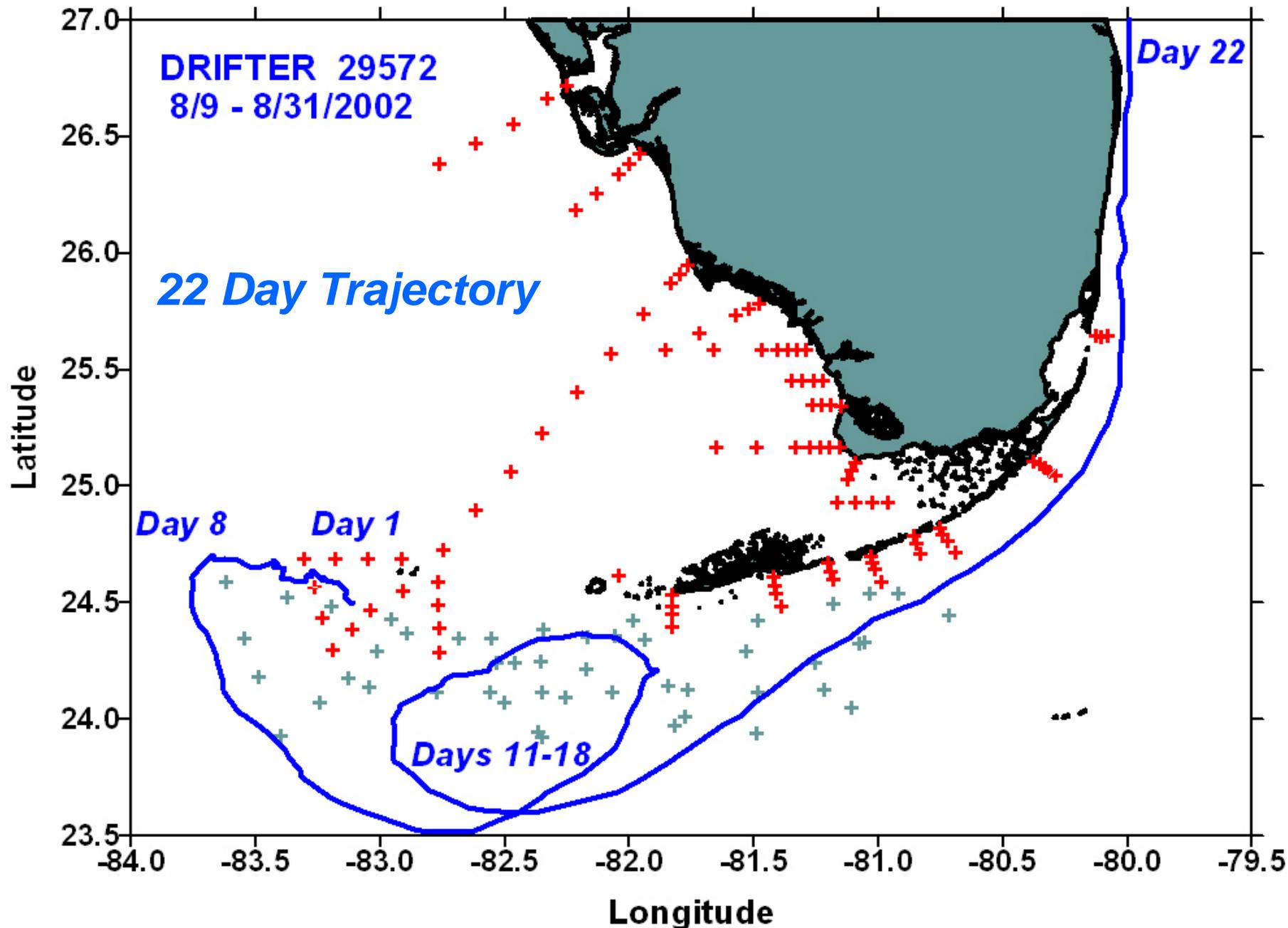
AUGUST 2002 DEPTH OF 12 C ISOTHERM



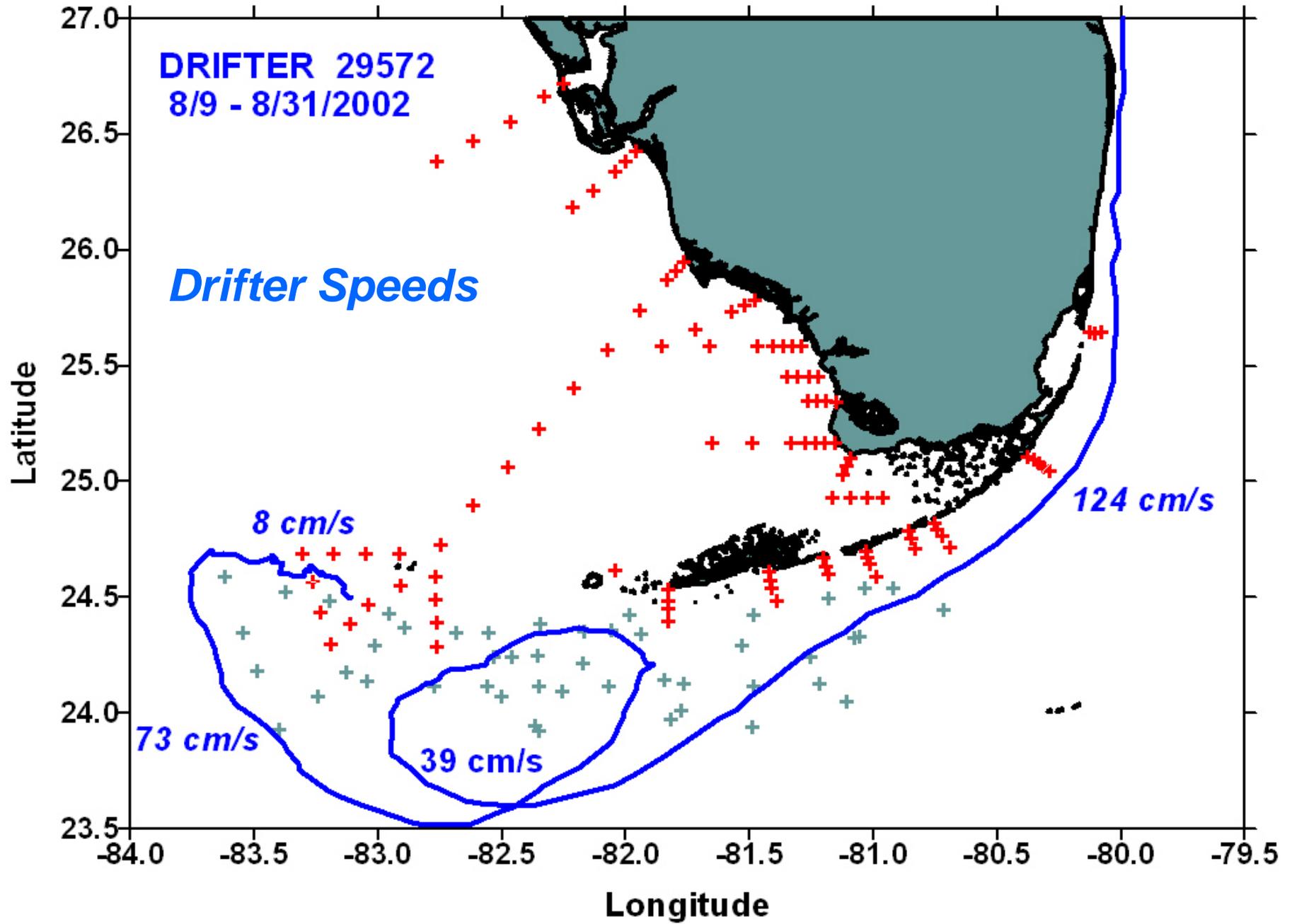
AUGUST 2002 DEPTH OF 12 C ISOTHERM



AUGUST 2002 STATION LOCATIONS



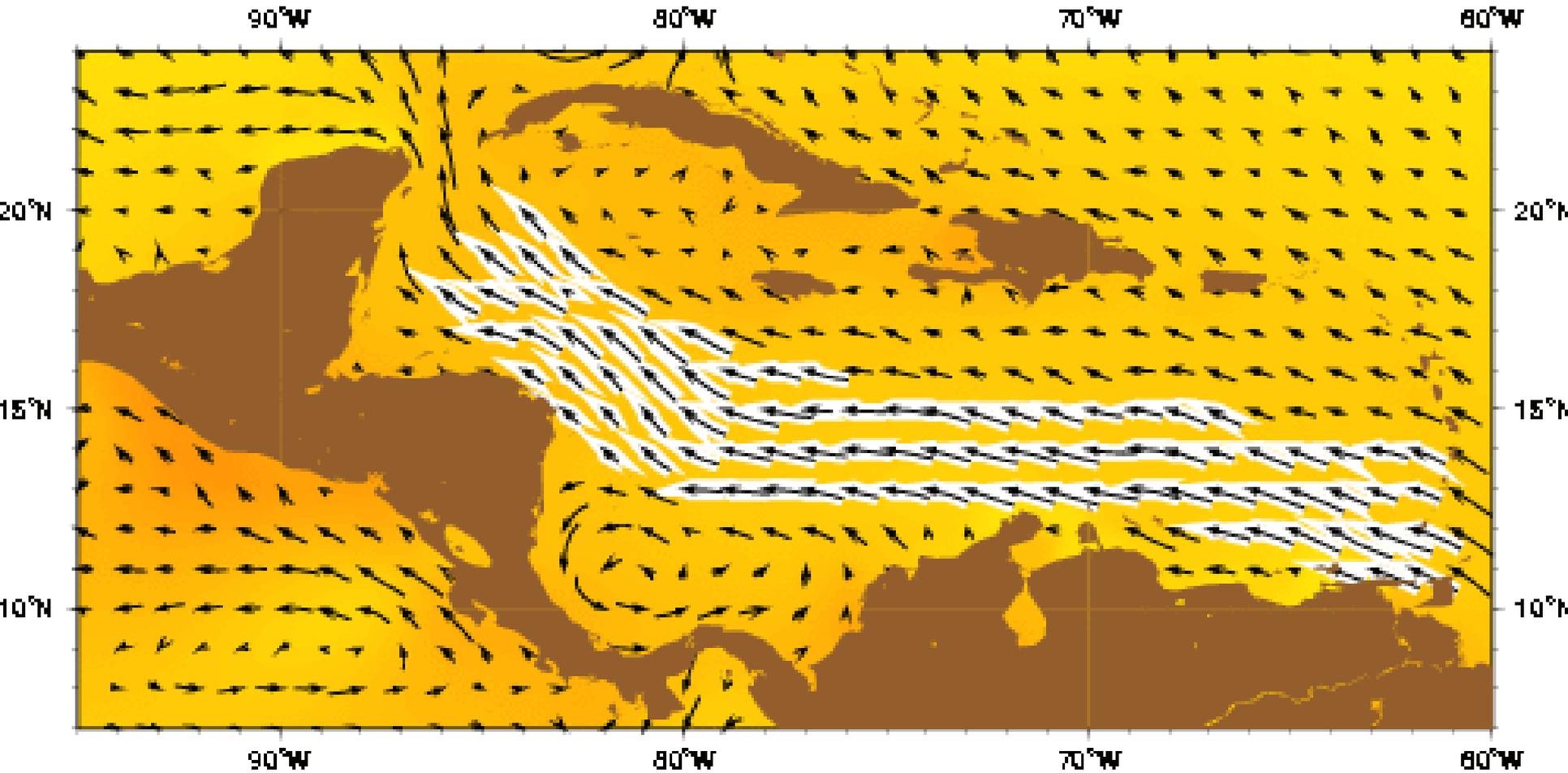
AUGUST 2002 STATION LOCATIONS



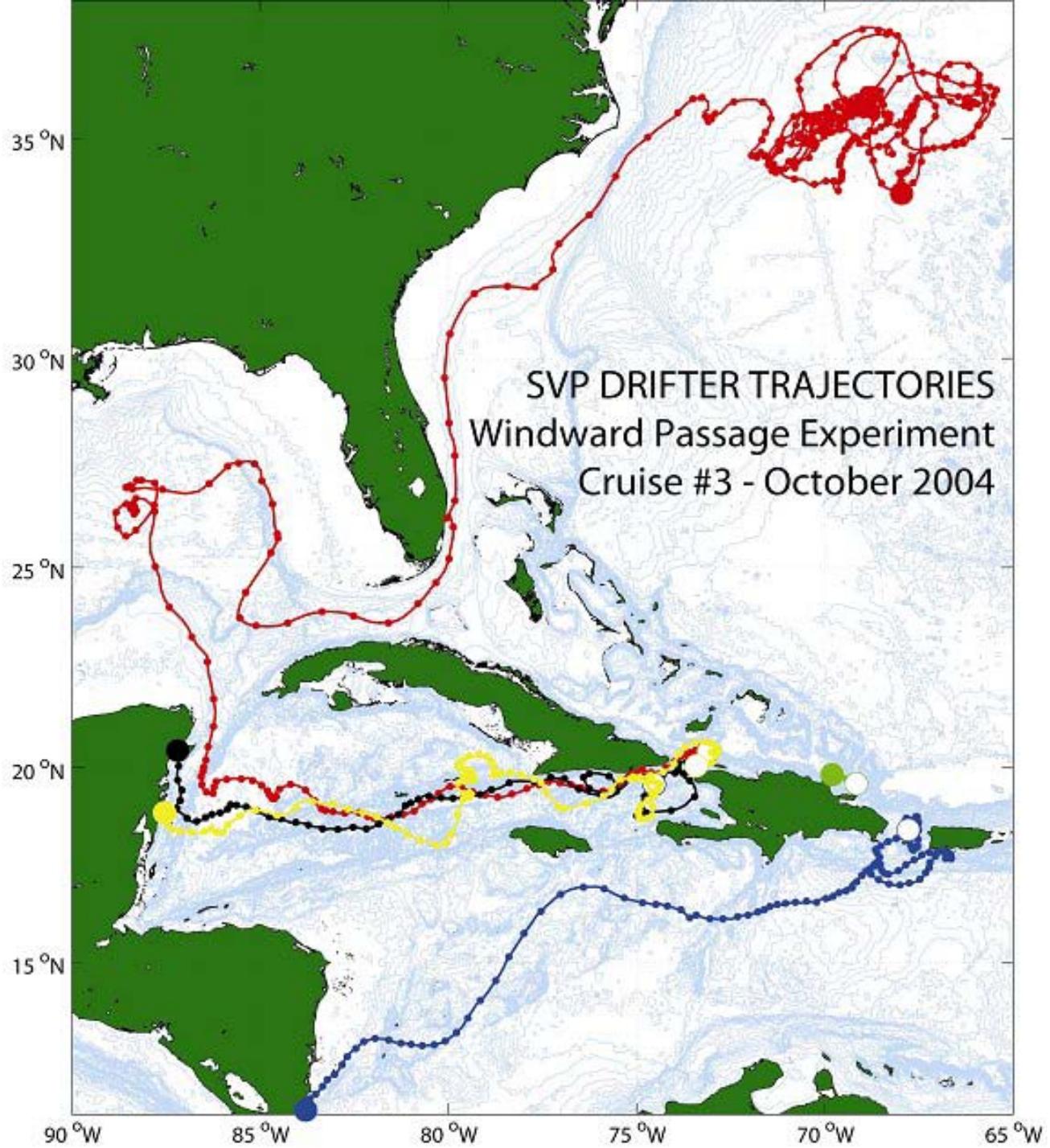


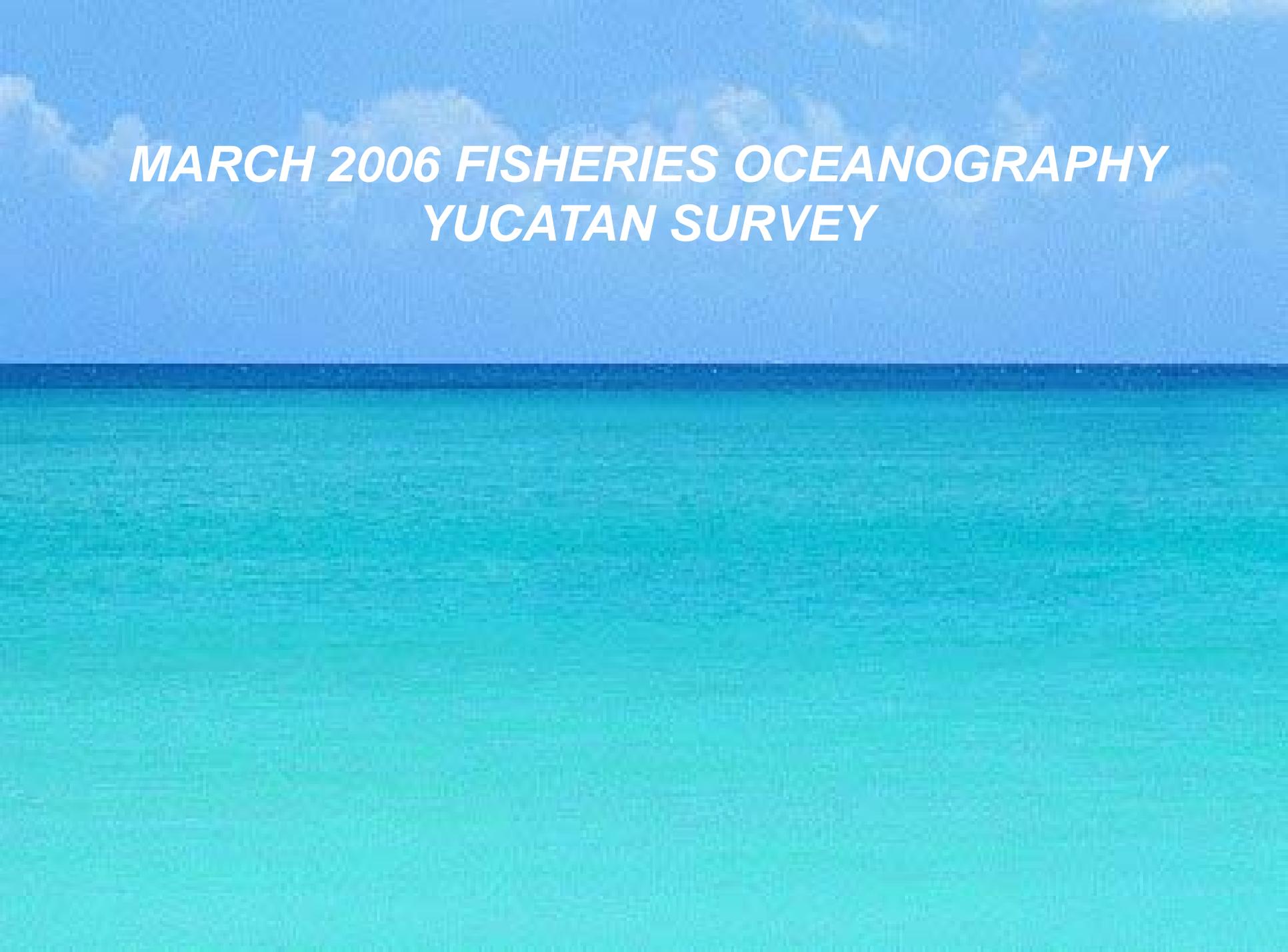
***CONNECTIVITY WITH OTHER REGIONS
OF THE WESTERN CARIBBEAN AND GULF OF
MEXICO***

CARIBBEAN CURRENT SYSTEM



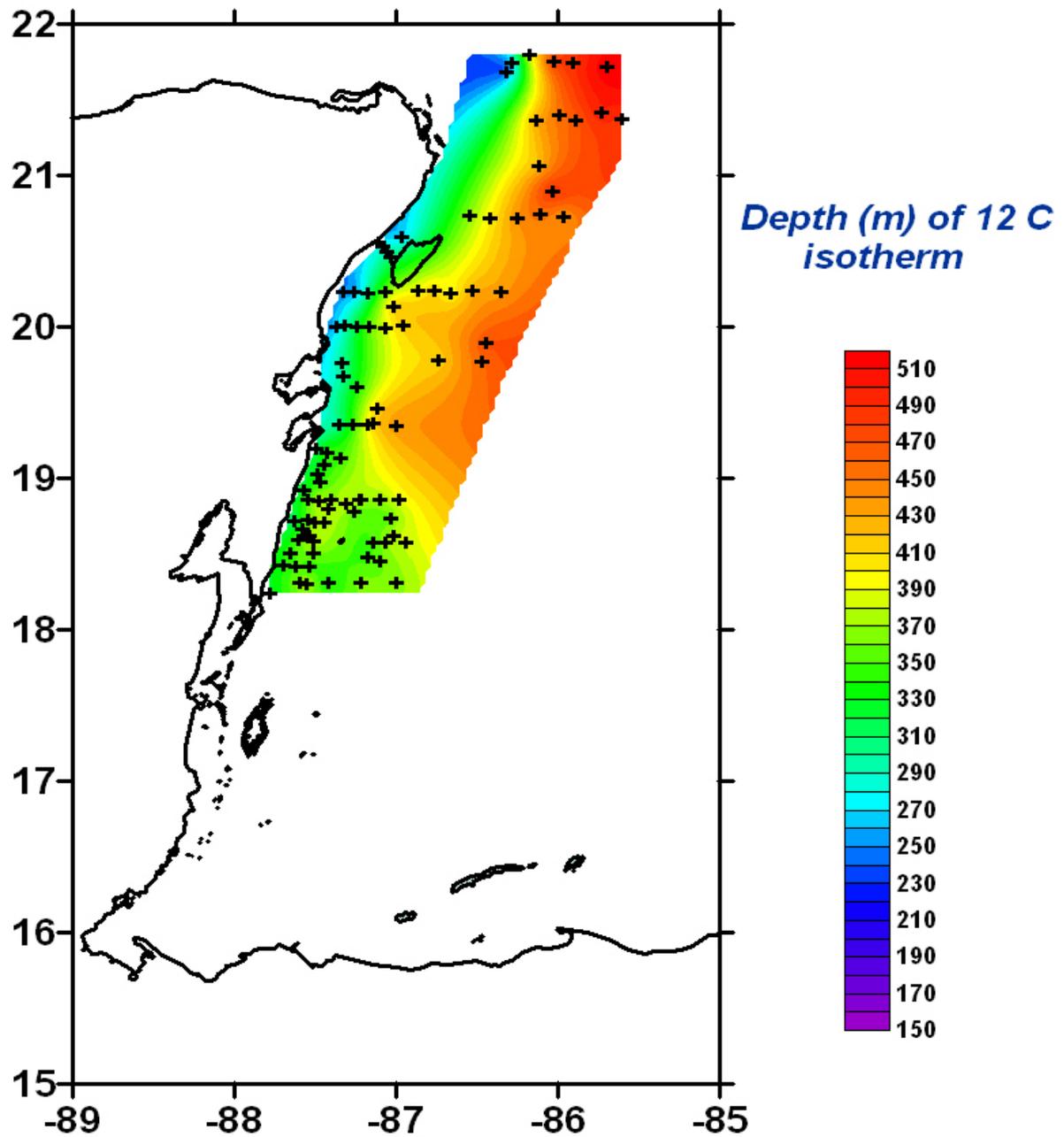
Mariano Global Surface Velocity Analysis (MGSVA)



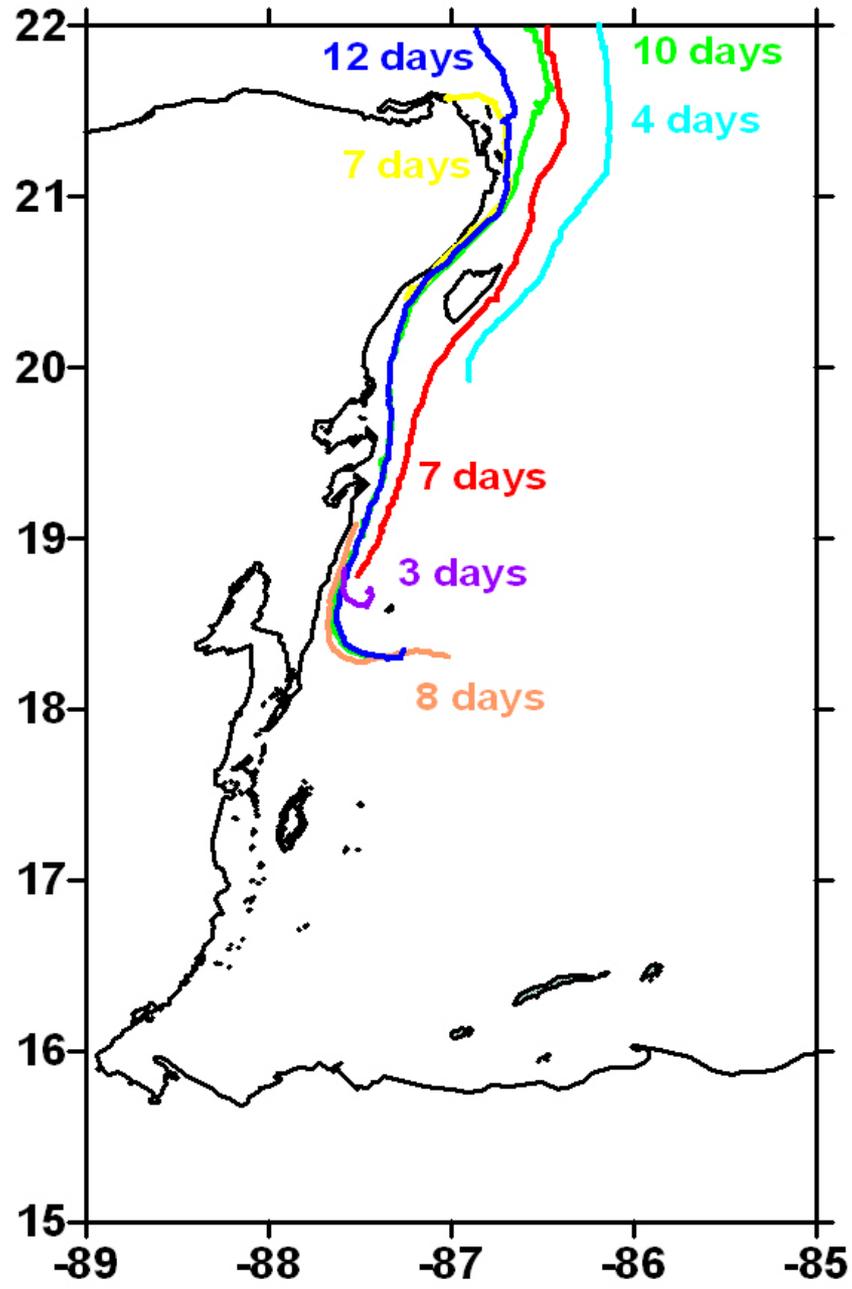


***MARCH 2006 FISHERIES OCEANOGRAPHY
YUCATAN SURVEY***

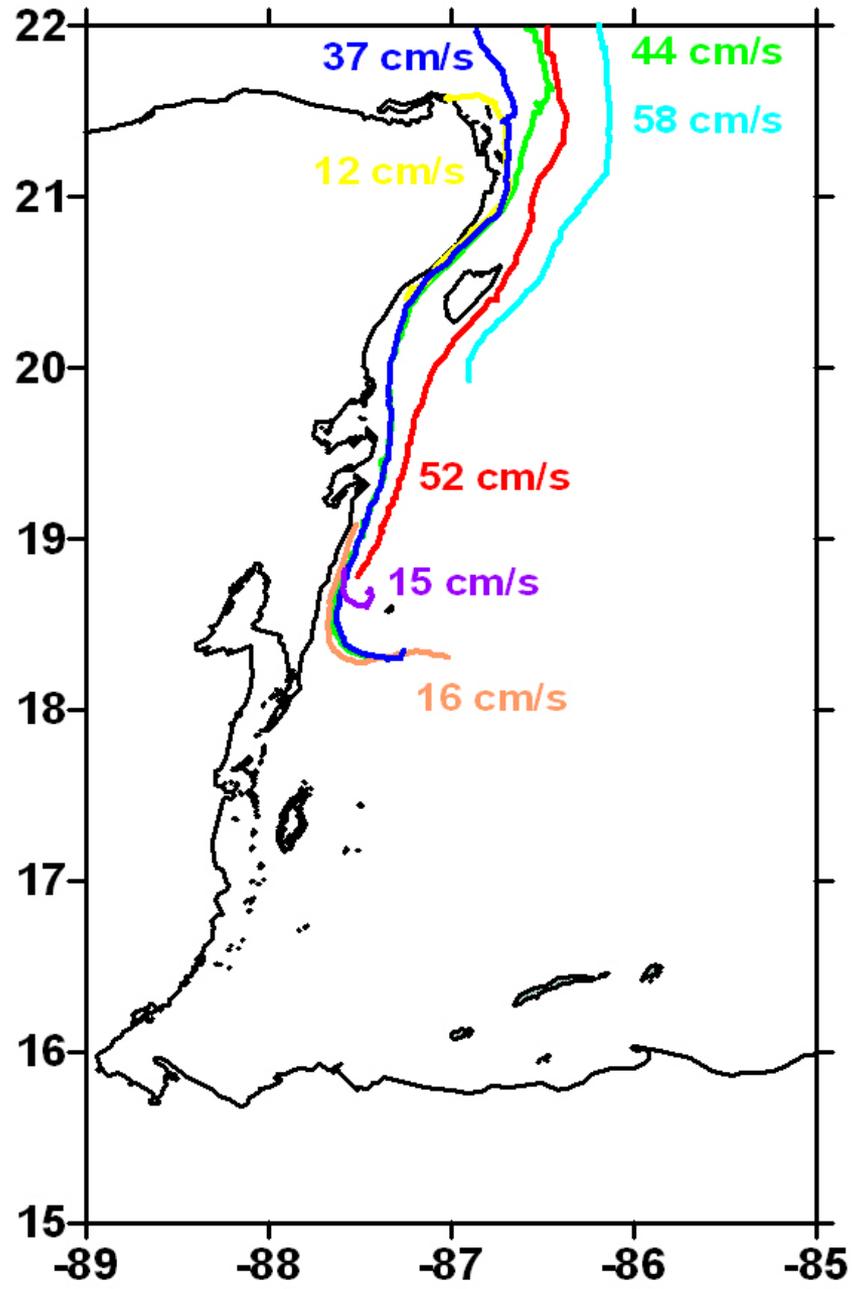
GORDON GUNTER CRUISE
March 2006



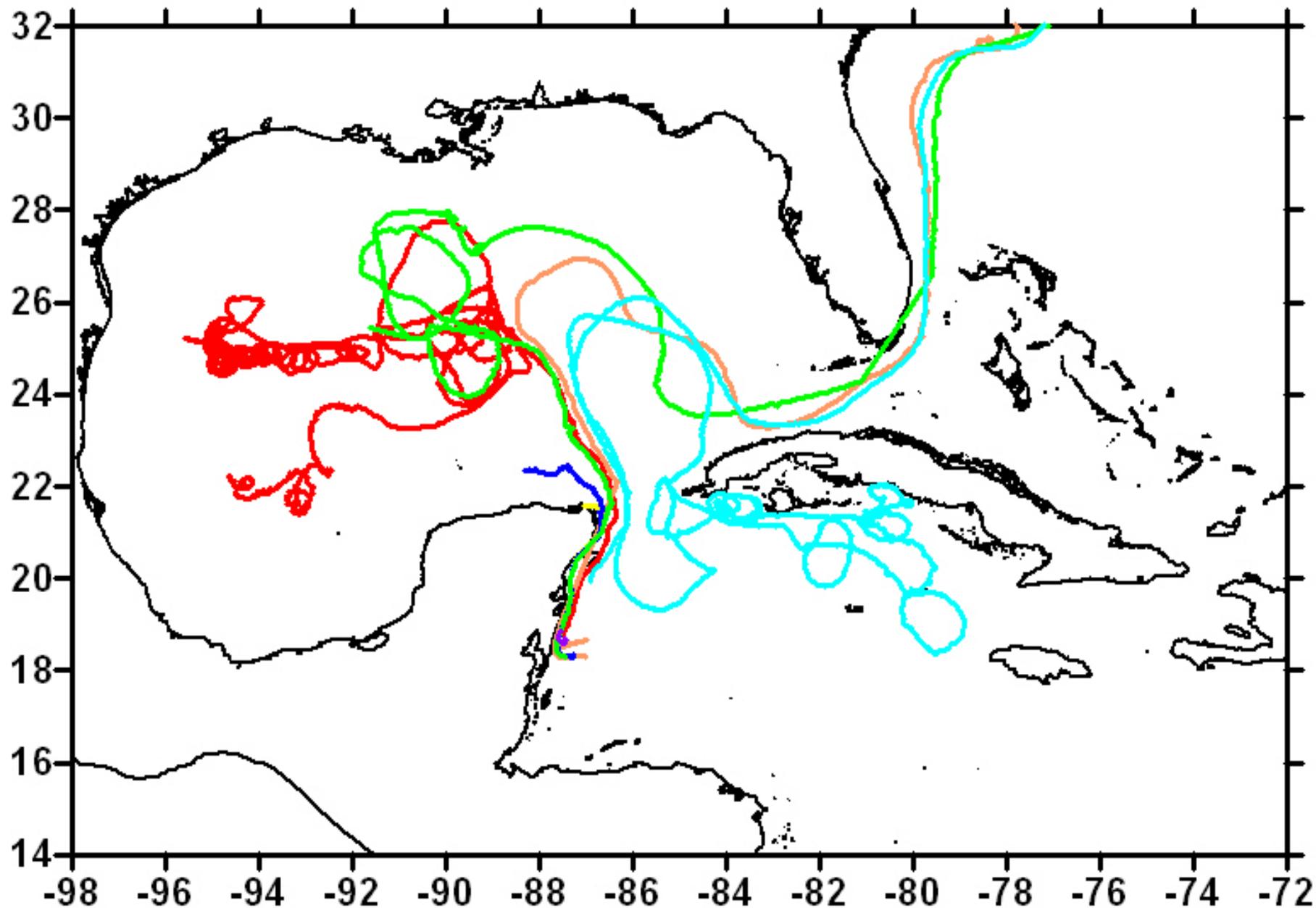
**GORDON GUNTER CRUISE
MARCH 2006
DRIFTER TRAJECTORIES**



**GORDON GUNTER CRUISE
MARCH 2006
DRIFTER TRAJECTORIES**



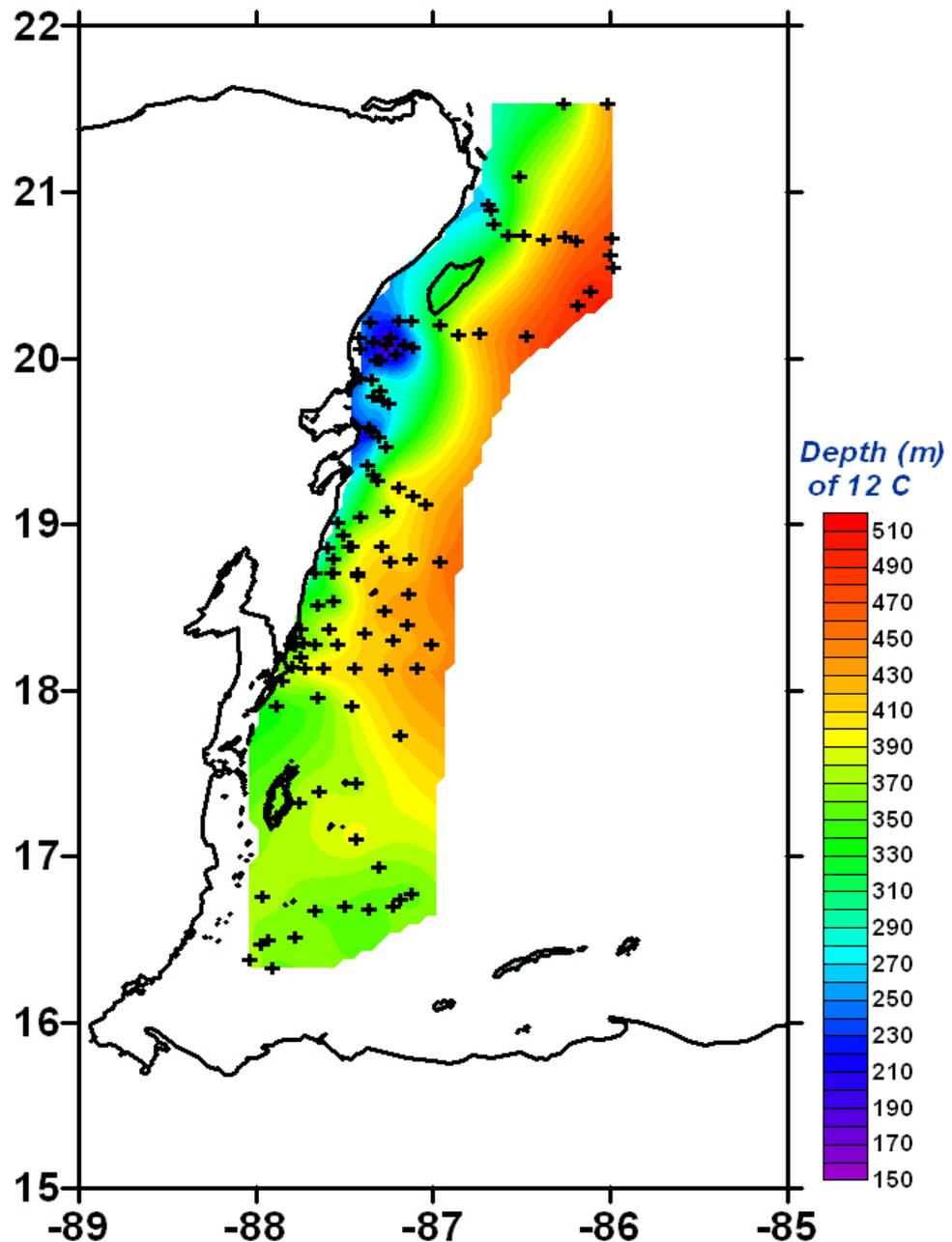
GORDON GUNTER MARCH 2006 DRIFTER TRAJECTORIES



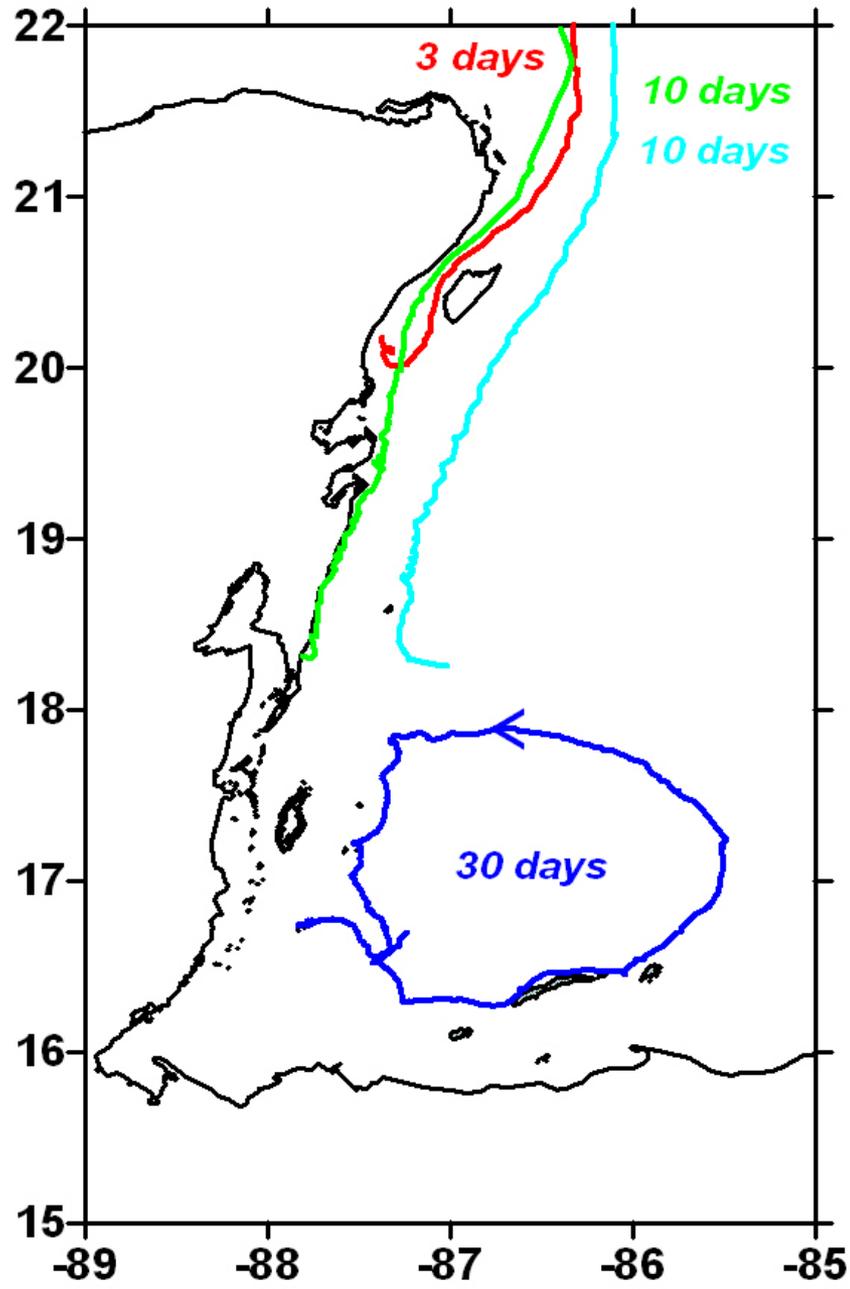


***JANUARY 2007 FISHERIES OCEANOGRAPHY
YUCATAN SURVEY***

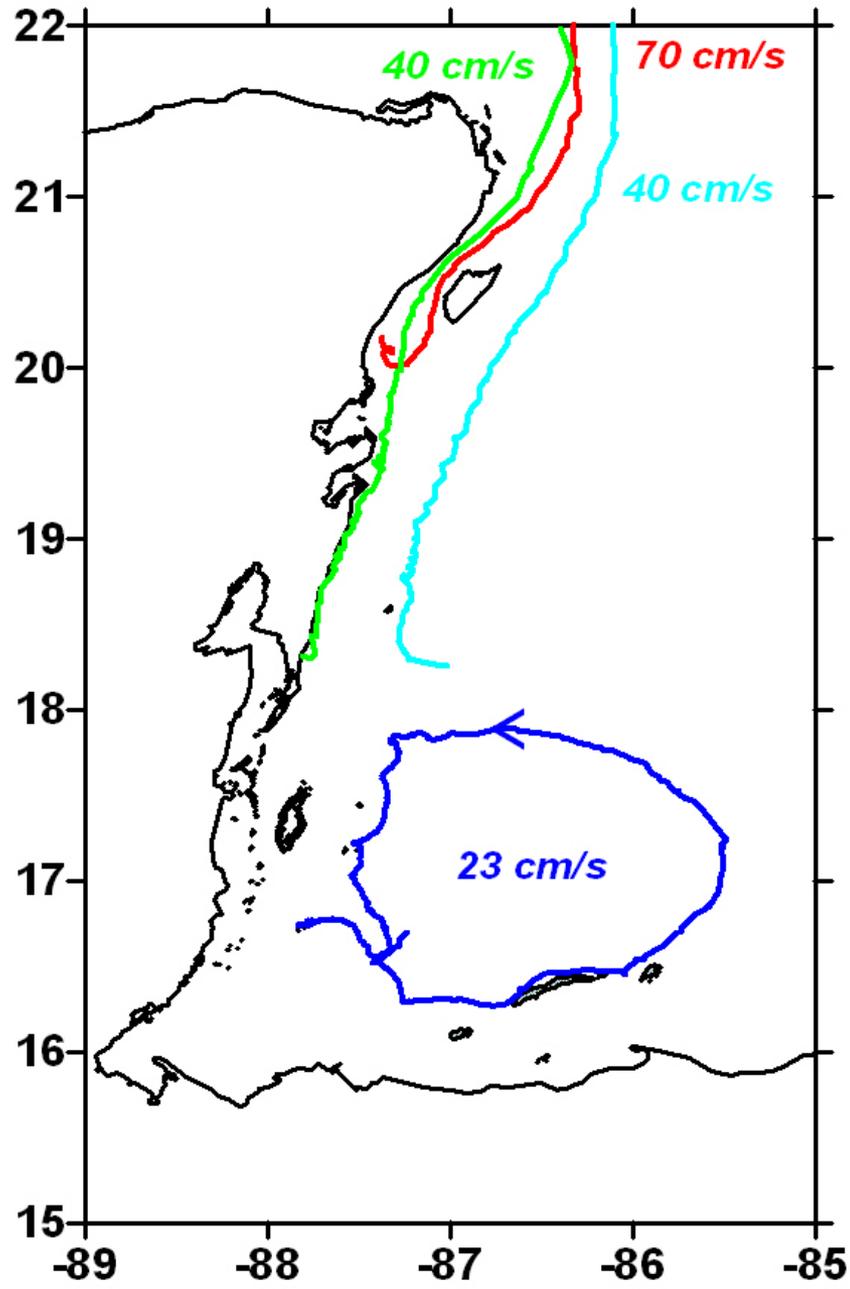
**GORDON GUNTER CRUISE
JANUARY 2007**



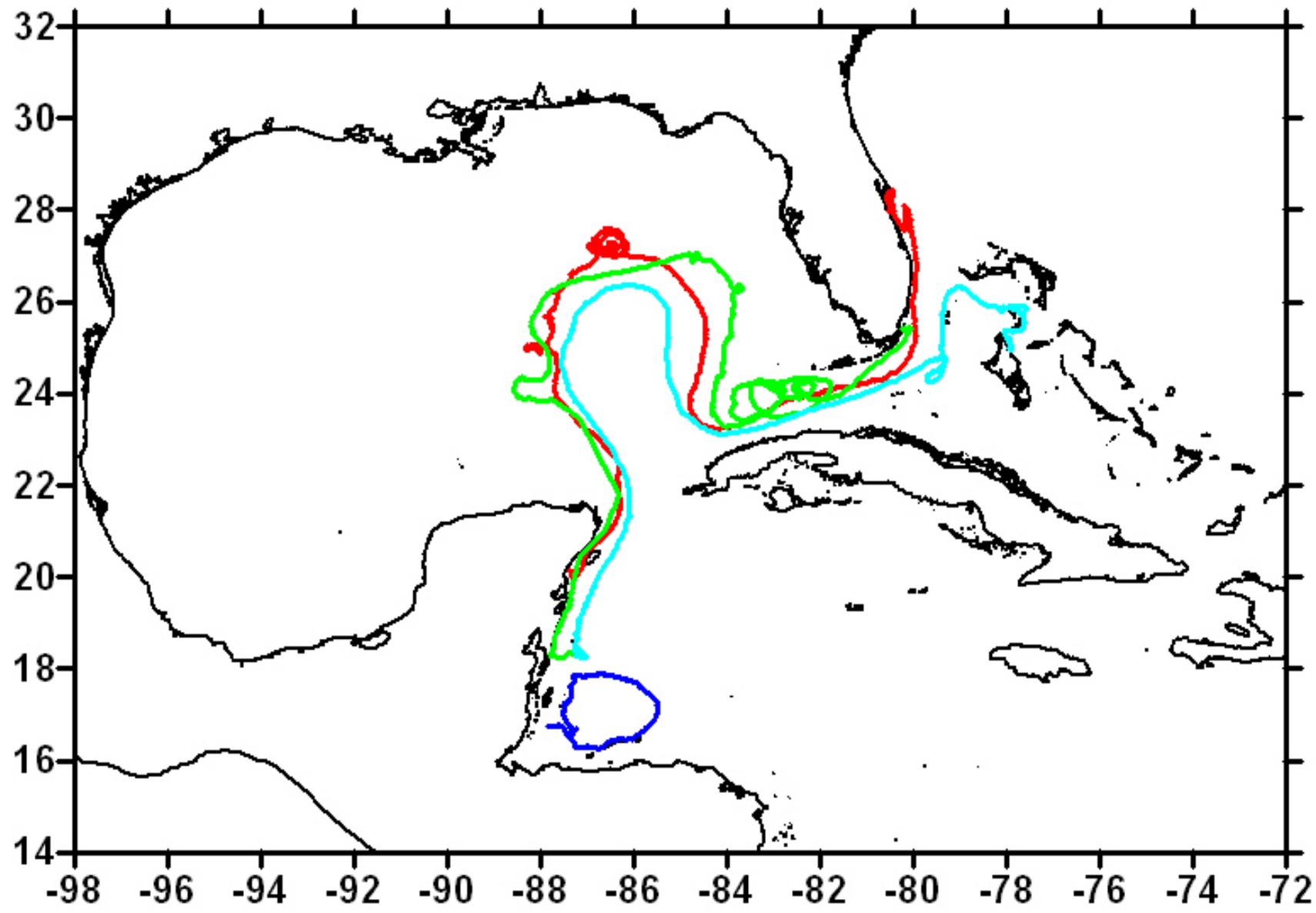
GORDON GUNTER CRUISE
JANUARY 2007
DRIFTER TRAJECTORIES



GORDON GUNTER CRUISE
JANUARY 2007
DRIFTER TRAJECTORIES



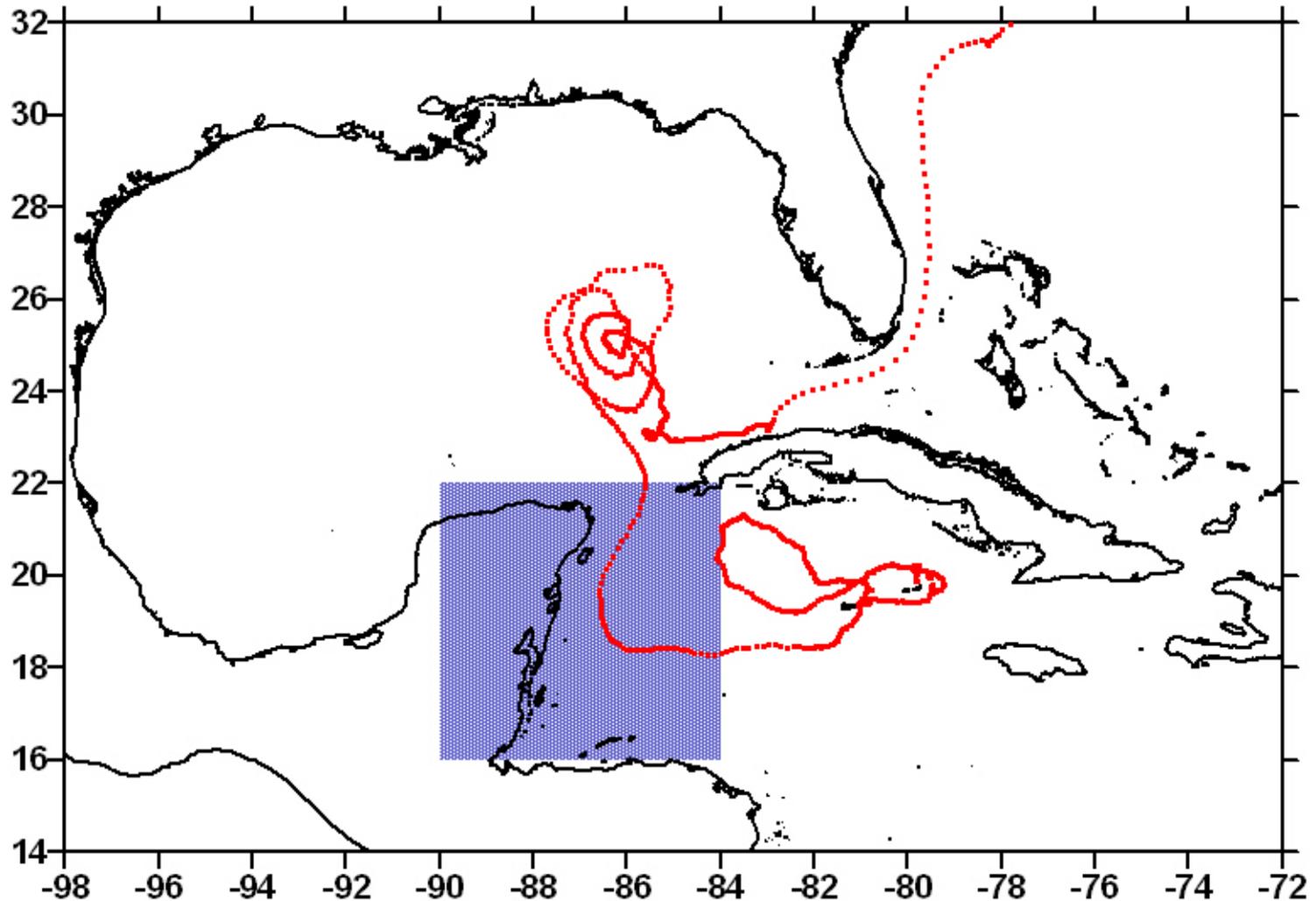
GORDON GUNTER JANUARY 2007 DRIFTER TRAJECTORIES





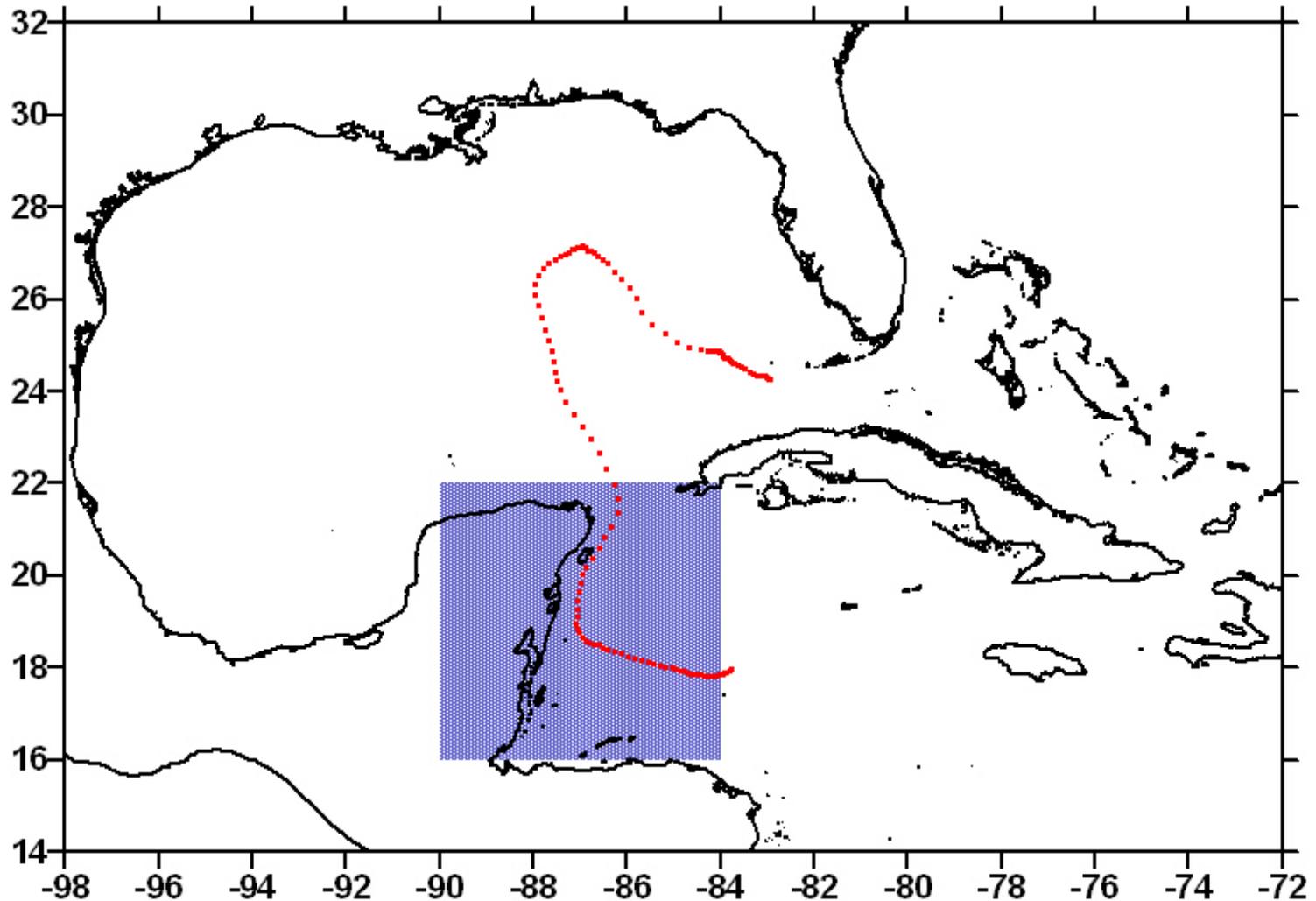
***THE NEXT STEP – a statistical treatment of the
GOOS drifter data***

DRIFTER 9819463



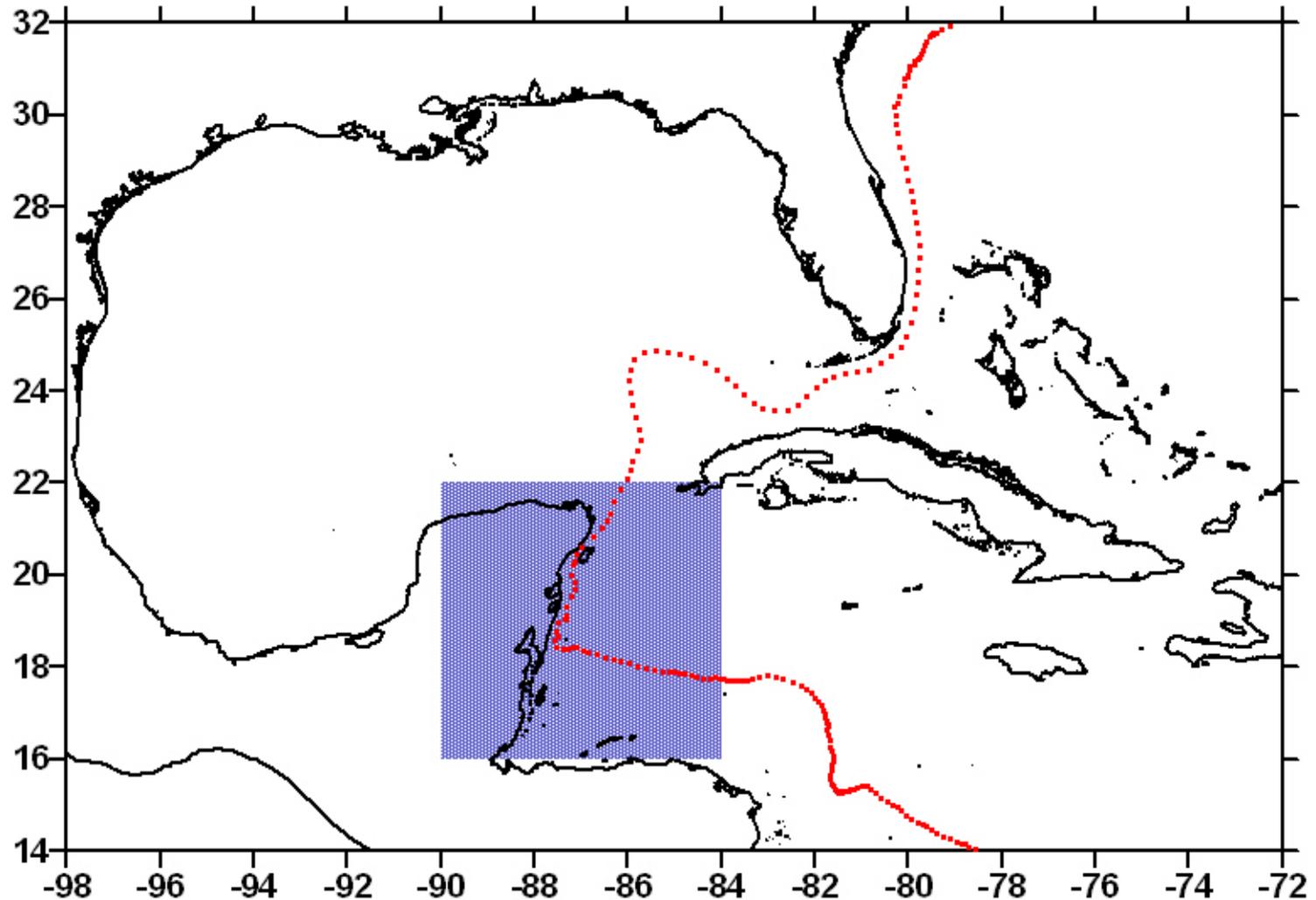
This drifter was deployed near Jamaica in October 1999. It took over three months to travel from 22 N to 83 W, the longitude of the Dry Tortugas.

DRIFTER 9817803



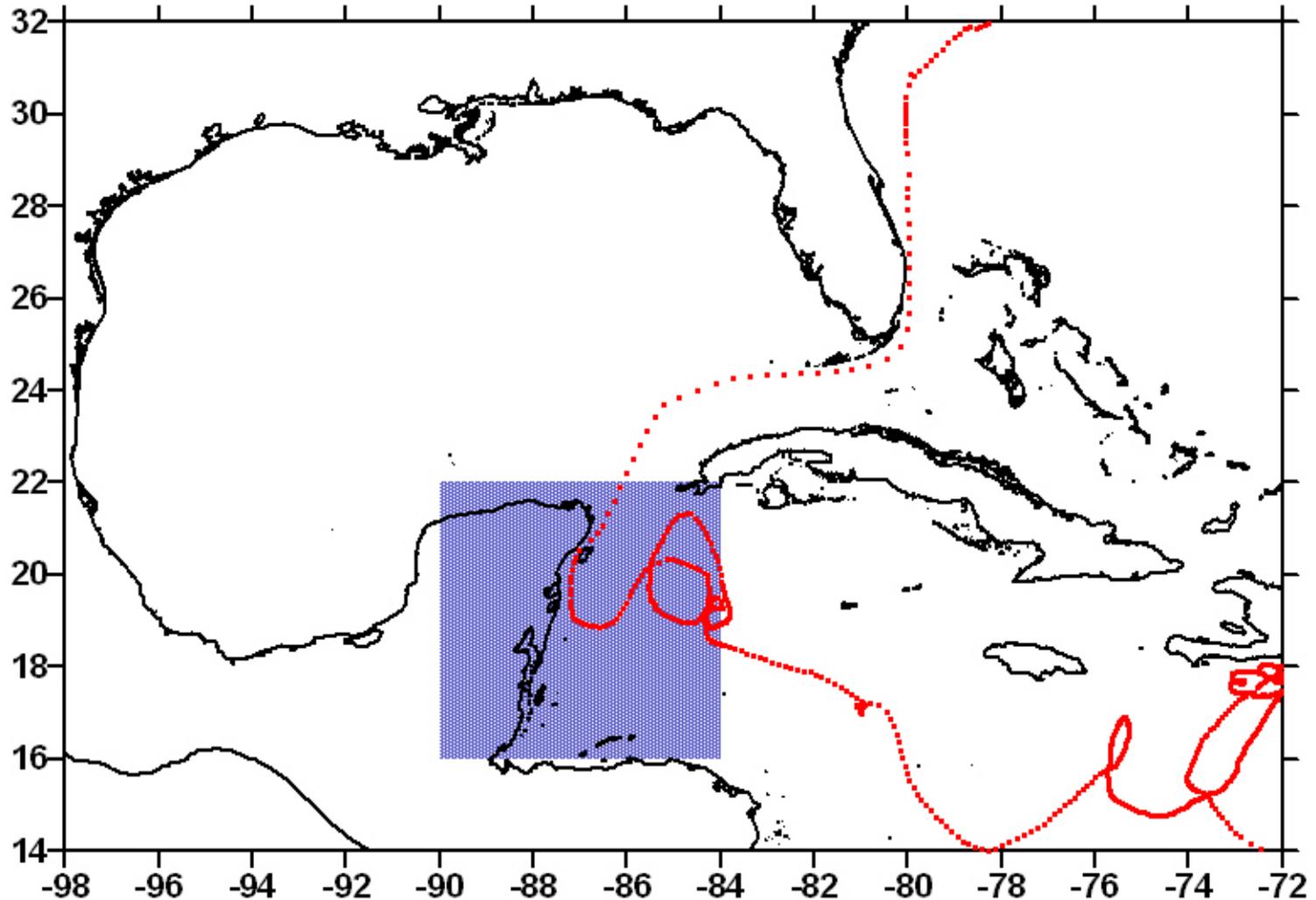
This drifter was deployed in January 1999 in the Western Caribbean Sea. It took 20 days to go from 22 N to 83 W.

DRIFTER 9804532



This drifter was deployed near 28 N, 55 W in September 1999. It went from 22 N to 83 W in 6 days.

DRIFTER 9526398

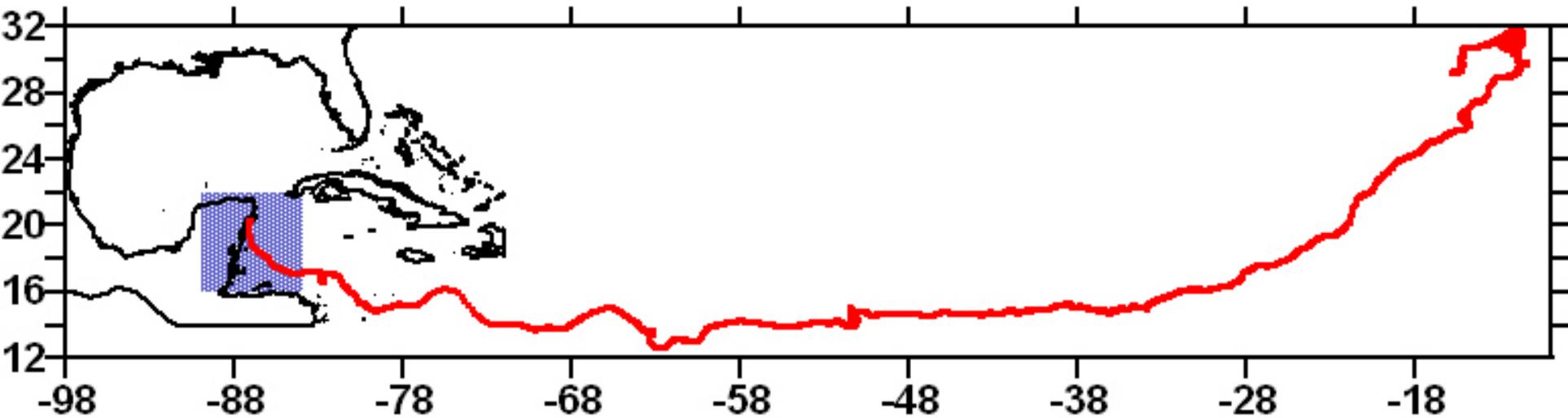


This drifter took the 22 N to 83 W speed record, getting to the Tortugas in exactly 3 days, at a rate of 3.2 kts or 185 cm/s.



Connectivity of the region with VERY far upstream waters...

DRIFTER 43583



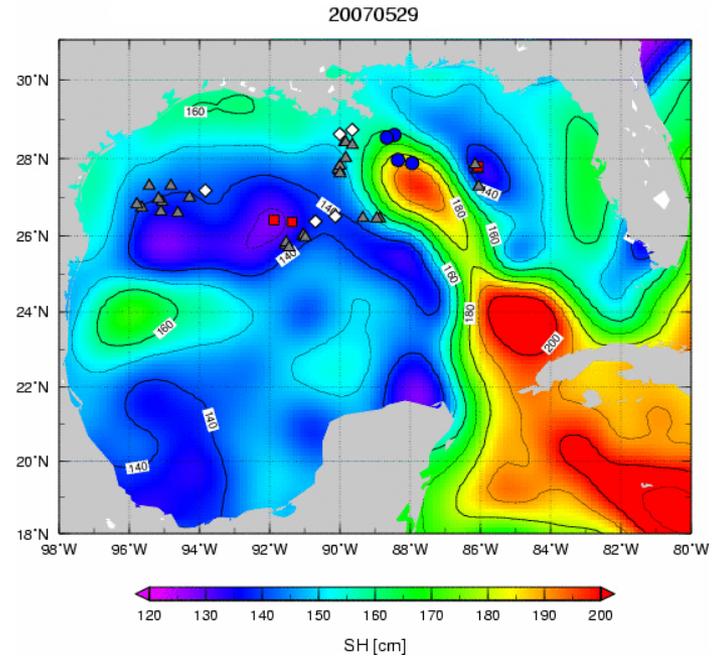
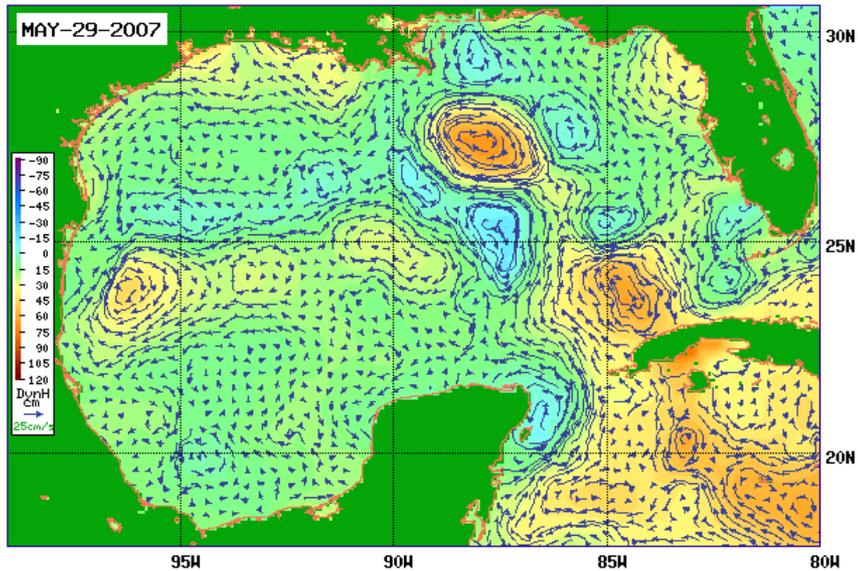
This drifter, deployed east of Morocco just south of the mouth of the Mediterranean Sea on October 7, 2004, took a year and a half to cross the Atlantic and grounded off Cozumel on March 24, 2006 during our cruise.

CONCLUSIONS

- 1. Coral reefs of the Florida Keys National Marine Sanctuary are physically connected by means of strong ocean currents to upstream waters of the Gulf of Mexico and Caribbean Sea.*
- 2. Eddies and gyres appear to play an important role in establishing the time and length scales of the connectivity.*
- 3. Regional interdisciplinary oceanographic surveys are an important tool for describing and understanding this variability.*
- 4. Satellite-tracked surface drifters, as well as remote sensing and numerical model products, are necessary for detecting linkages between widely separated oceanic regions.*
- 5. The physical connectivity between geographically separated spawning grounds may have an important influence on the degree of biological connectivity between larval populations.*

Link between western bluefin tuna and ocean environmental conditions in the Gulf of Mexico

The objective of this work is to monitor the motion of the Loop Current and its associated rings using satellite observations (sea height, color, SST) to identify how the surface and subsurface ocean conditions relate to stock assessment.



Catches in:

Blue circles = Loop Current

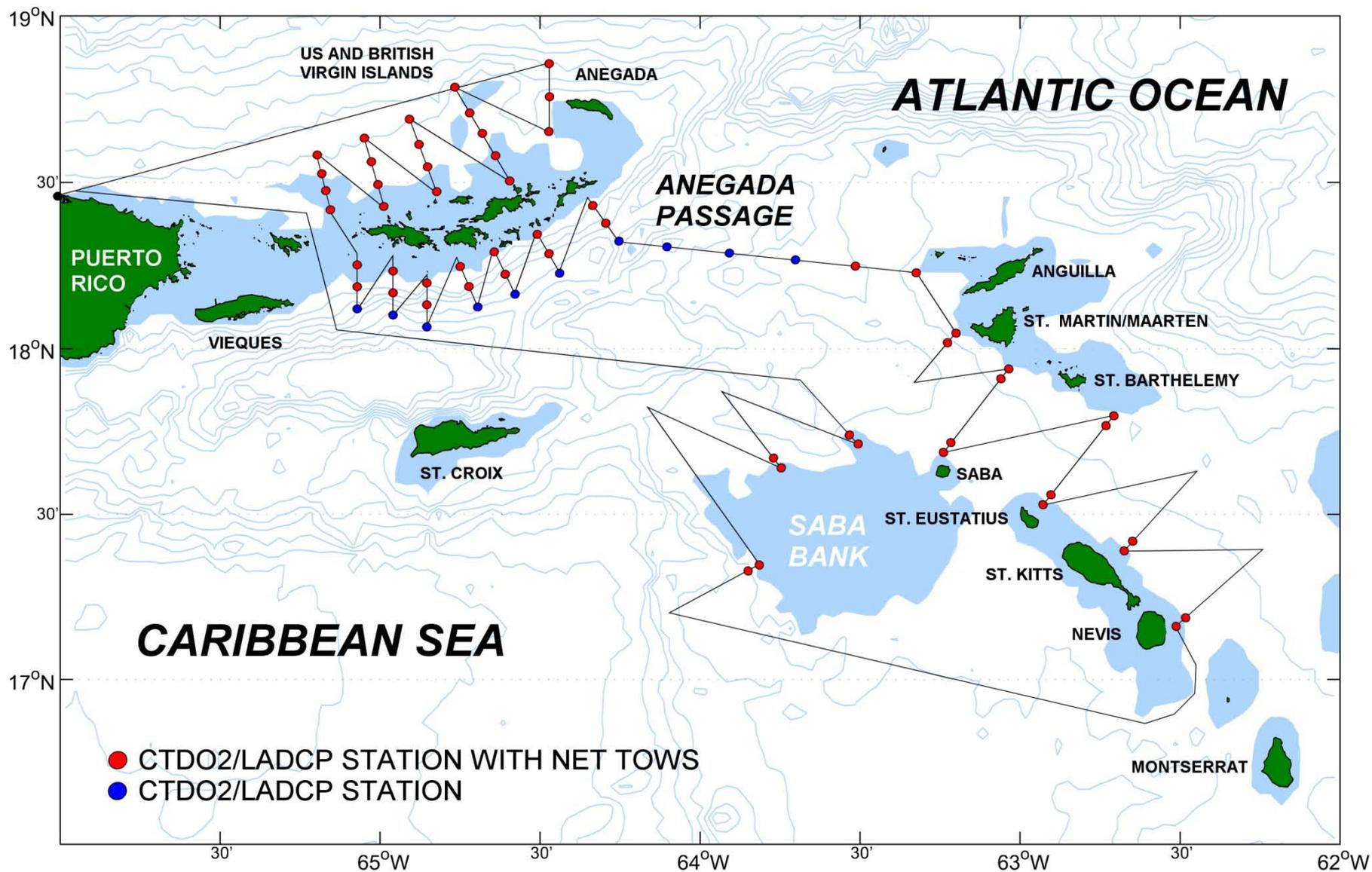
Grey triangles = frontal

Red squares = Cyclonic

White diamonds = common waters

Lead PIs: Gustavo Goni (NOAA/AOML) and Guillermo Diaz (NOAA/NMFS)

NANCY FOSTER CRUISE March 11-24, 2008





QUESTIONS?