

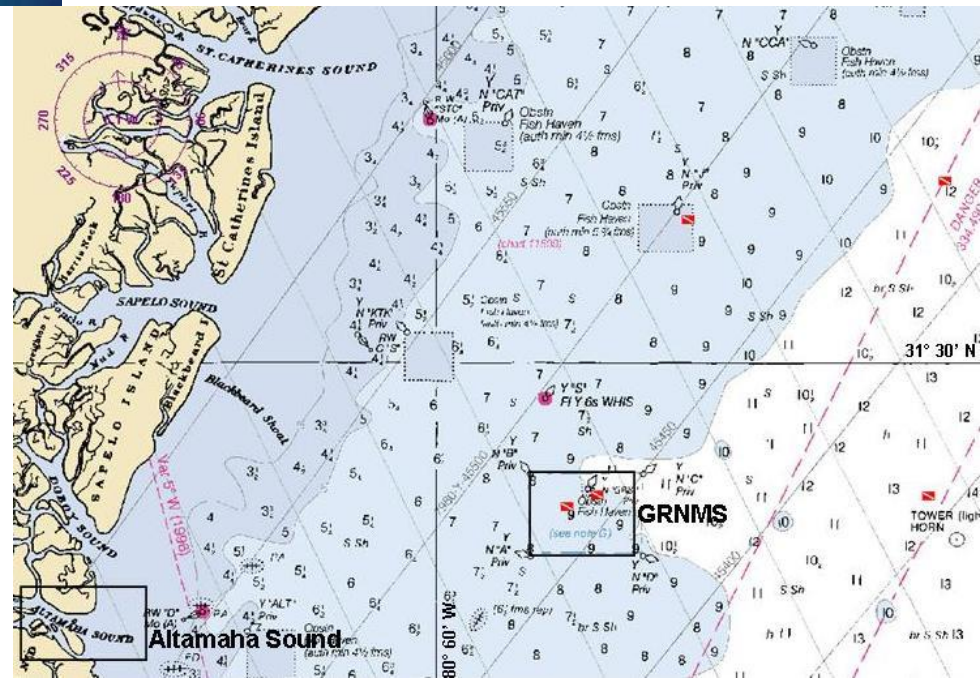
CIG Cycle 16: Connectivity Between the Altamaha River and Critical Coastal Marine Habitats

Daniel F. Gleason^{1,2}
Risa A. Cohen²
Wei Tu³

¹Inst. for Coastal Plain Science

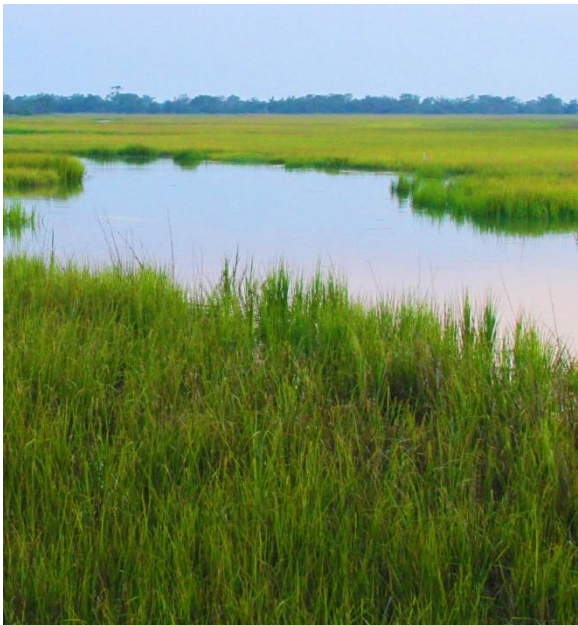
²Dept. of Biology

³Dept. of Geology and Geography
Georgia Southern University

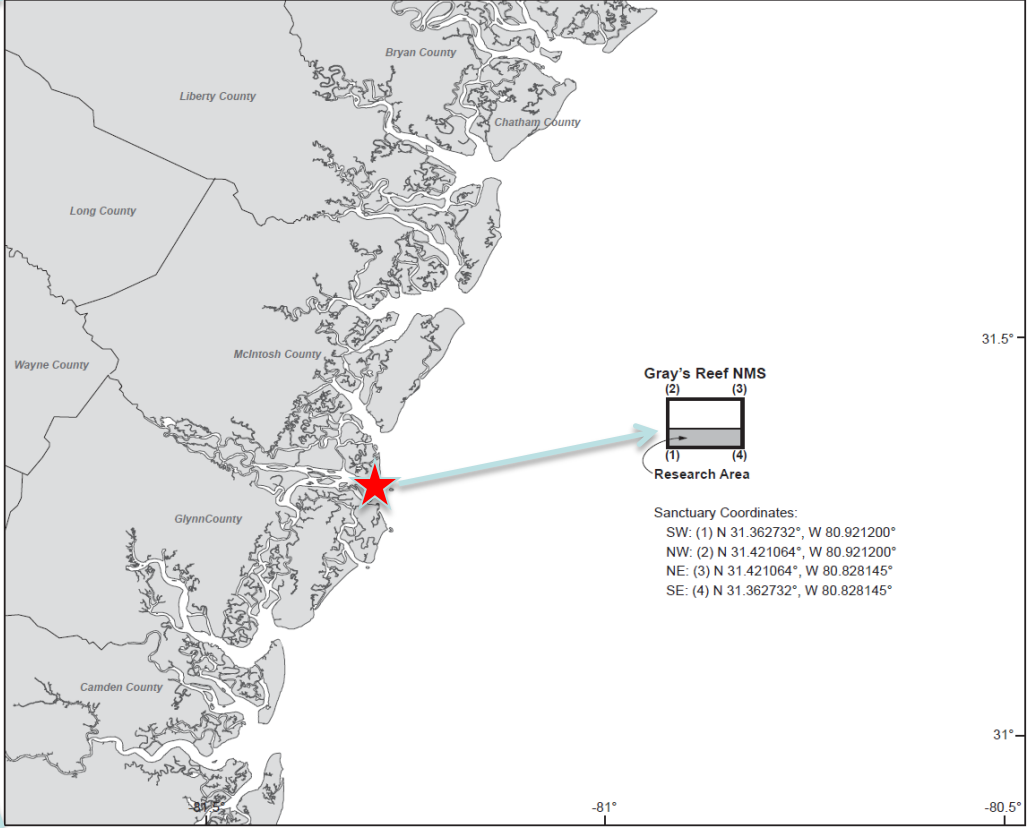
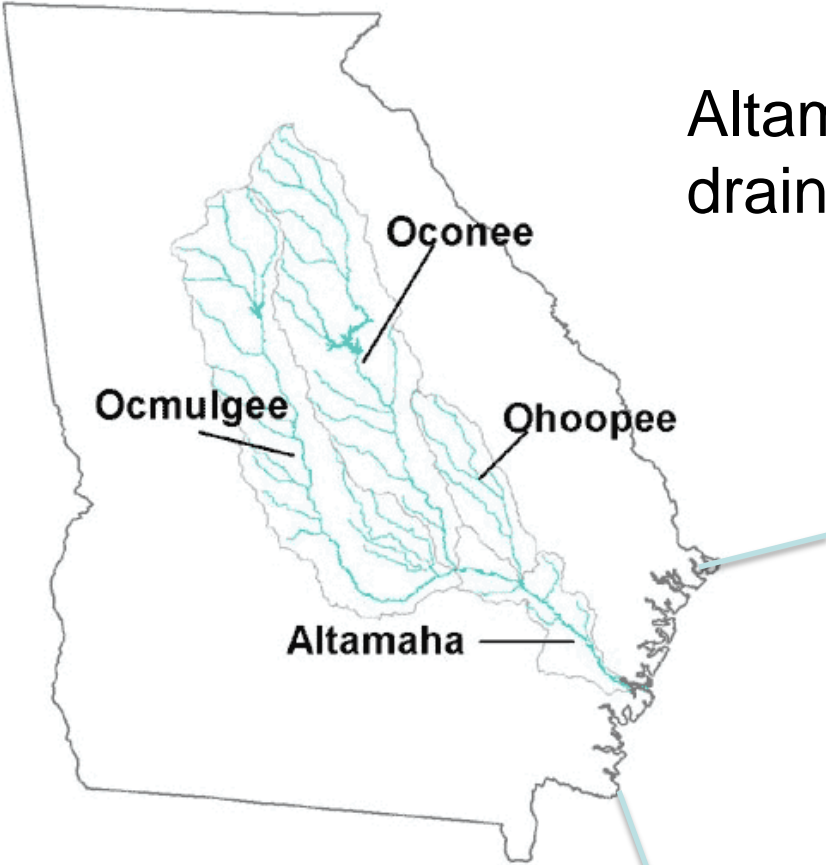


Hypothesis

- Hard bottom reef communities in coastal Georgia are sustained by subsidies from salt marsh estuaries.
 - Prediction: Physical linkages between estuaries and reefs exists.



Altamaha River watershed drains nearly 1/4 of state



Study Components

- Rhodamine WT Dye
 - Simulates dissolved substances
- Drifters
 - Simulates floating debris



Dye Deployments



May & September 2014, 2015



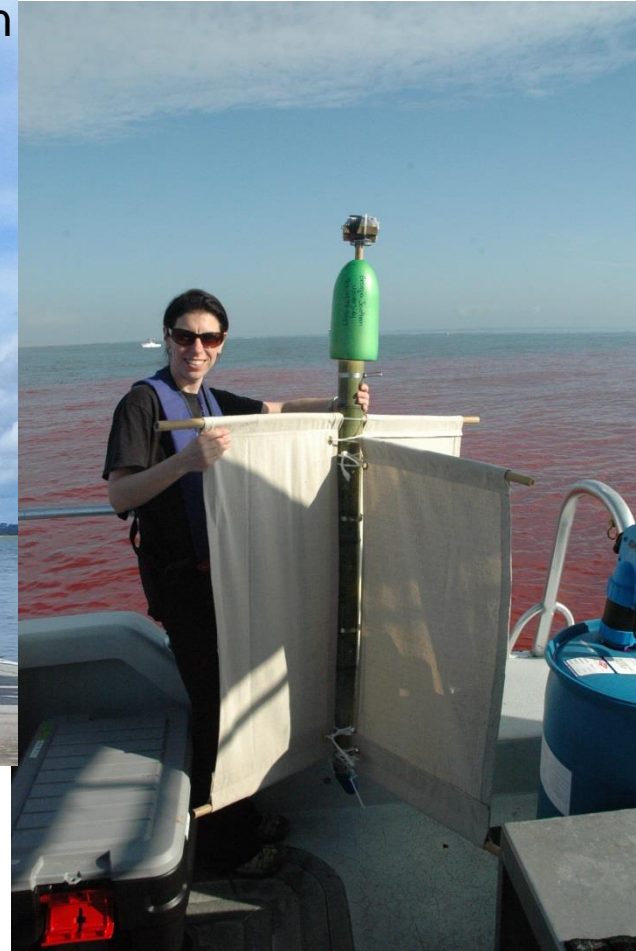
Approx. 190 liters
Rhodamine WT

Dye Detection



- Fluorometer with Rhodamine WT sensor
- Rhodamine WT
 - Excitation = 556 nm
 - Emission = 580 nm

Drifter Construction & Deployment



Drifter building workshops
organized and hosted by
GRNMS





Features

- **Highest Reliability**
- **Lowest Cost LEO Satellite Communications**
- **Environmentally Hardened**
- **Fully Waterproof**
- **Completely Self-Contained**
- **Smallest Simplex Tracker**
- **Multi-Year Battery Life**
- **Quick & Simple Installation**
- **Flexible Mounting System**

CALL FOR DETAILS!

TrackPack



The North Star **TrackPack** is a highly reliable, self contained, environmentally hardened asset tagging and tracking solution. **TrackPack** uses the SENS CPDMA, an LPI LPD satellite communications system, to provide a robust, easy to use asset tracking solution.

The self contained **TrackPack** unit has integral antennas and long life internal batteries. It can be wirelessly provisioned in the field using a wireless USB dongle.

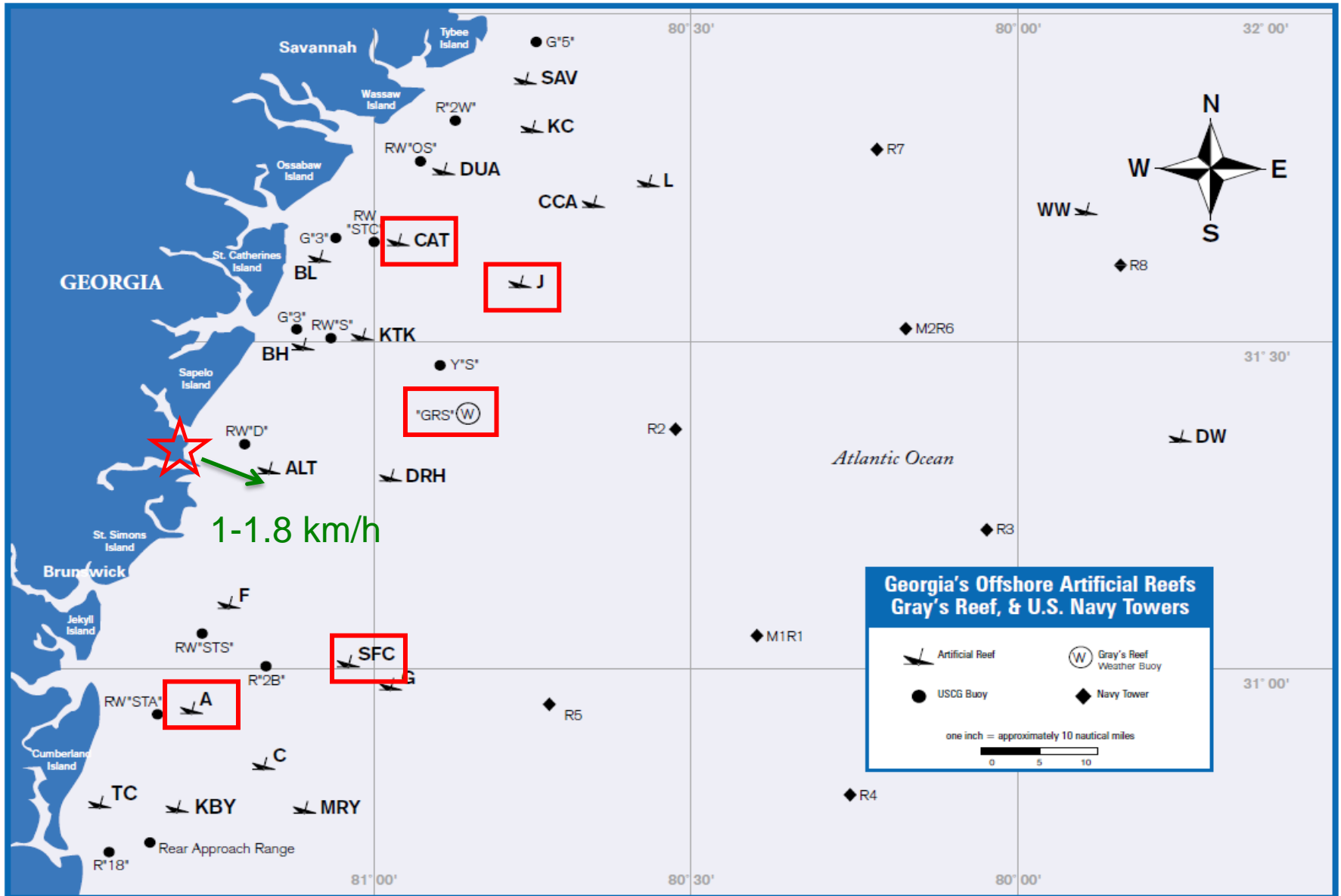
The **TrackPack** is a complete, low cost of ownership solution, boasting the smallest Simplex Satellite Device transmission available in the market.

Specifications

Enclosure:	5" x 2.7" x 0.82" (127x69x21mm)
Mass:	5.9 oz (167g)
Volume:	11.07 cubic inches
Temperature:	-40C (-40 F) to +85 C (+185 F) Operating
Humidity:	100% at 50 C, Salt, Fog Testing per MIL STD 810
Vibration/Shock:	MIL STD 810, SAE J1455
Water:	Waterproof, Full immersion at 1m depth
Battery:	Internal (primary), Ultrasonically Welded Li/FeS ₂ pack-3000mA-hr, 4.5VDC
Life Expectancy:	>5 Years at 2 messages per day >10 Year Storage Life (sleep mode)
Provision / Setup:	802.15.4 Wireless Interface for TrackPack Setup
Mounting:	Tape, Magnet, Mounting Plate, Screw, Velcro
Certifications:	- FCC part 15 and part 25, CFR - Industry Canada - ETSI EN 301 489-1-(2004-08) - ETSI EN 300 440-2 V1.2.1, ETSI EN 301 489-3 and ETSI EN 301-489-2 - UL913, Class 1, Division 1, ATEX and HERO in progress

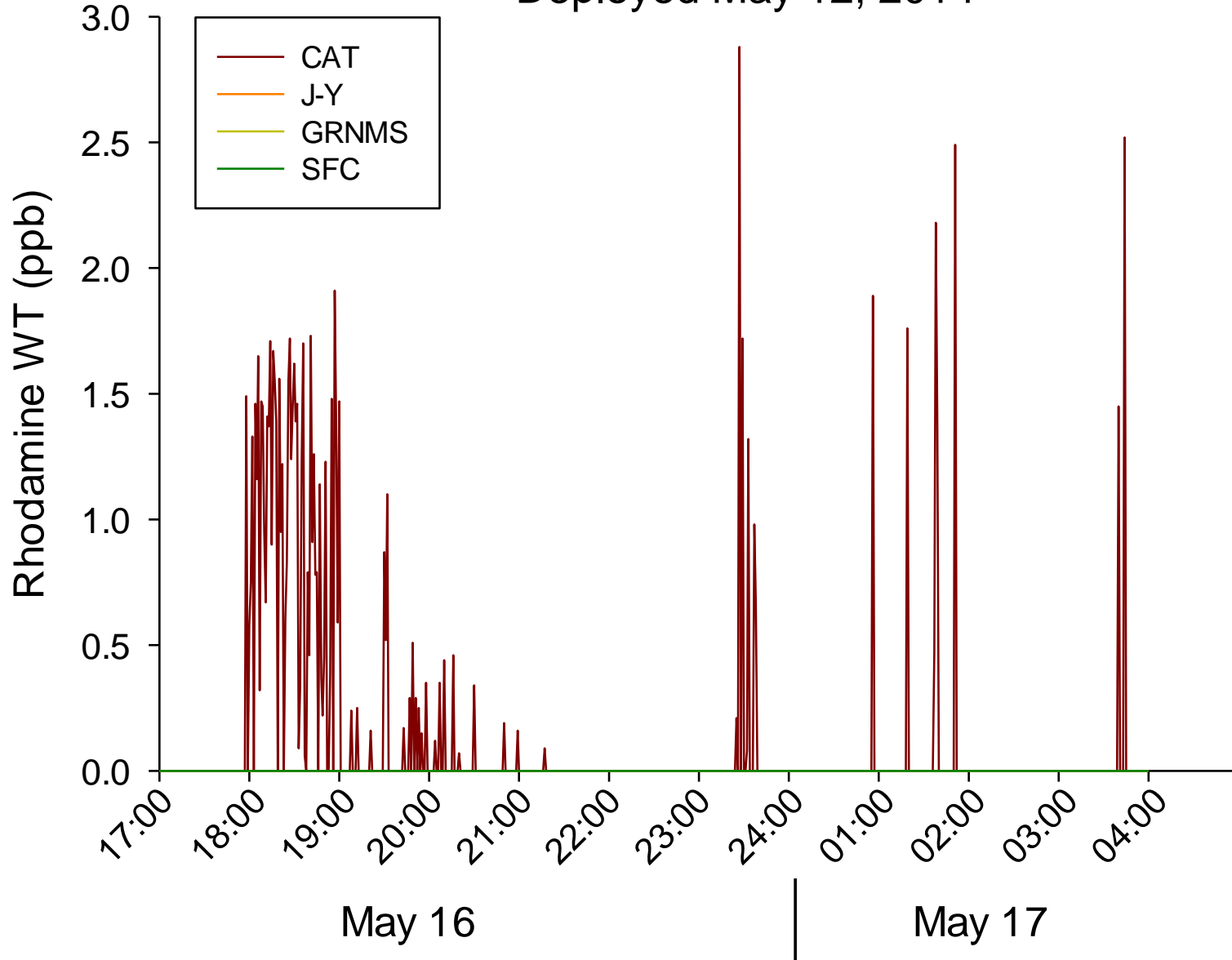


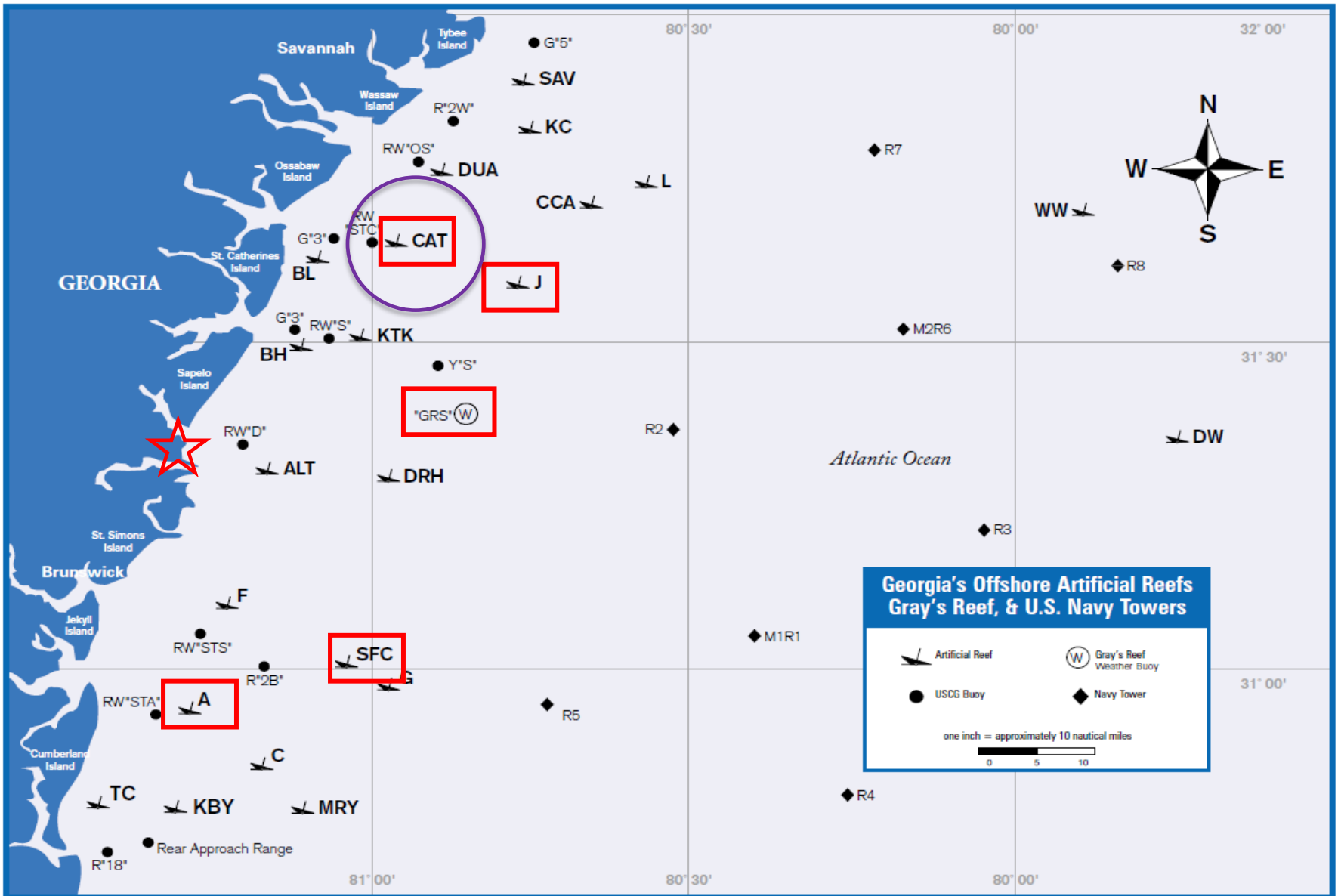
Where did the Rhodamine go?



Where did the Rhodamine go?

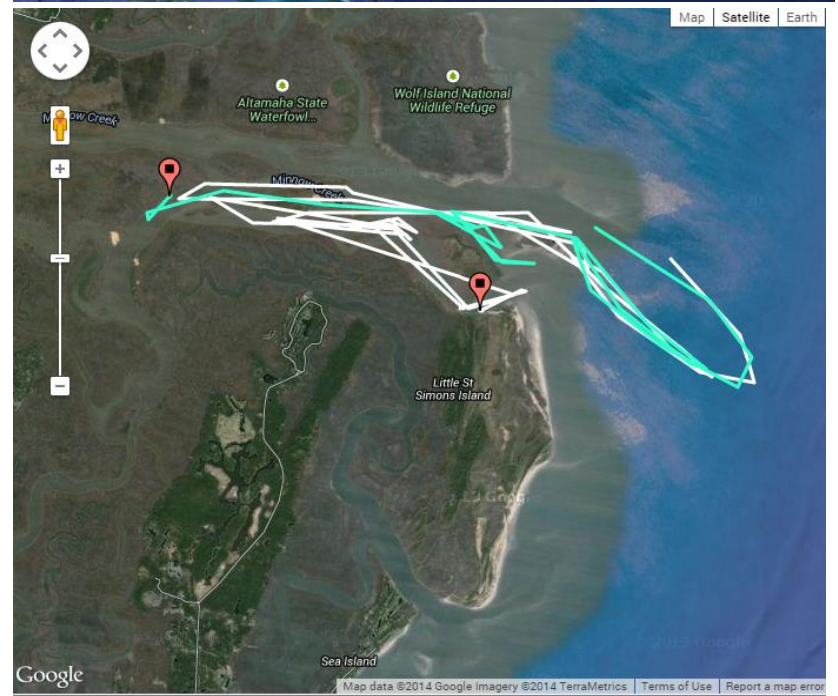
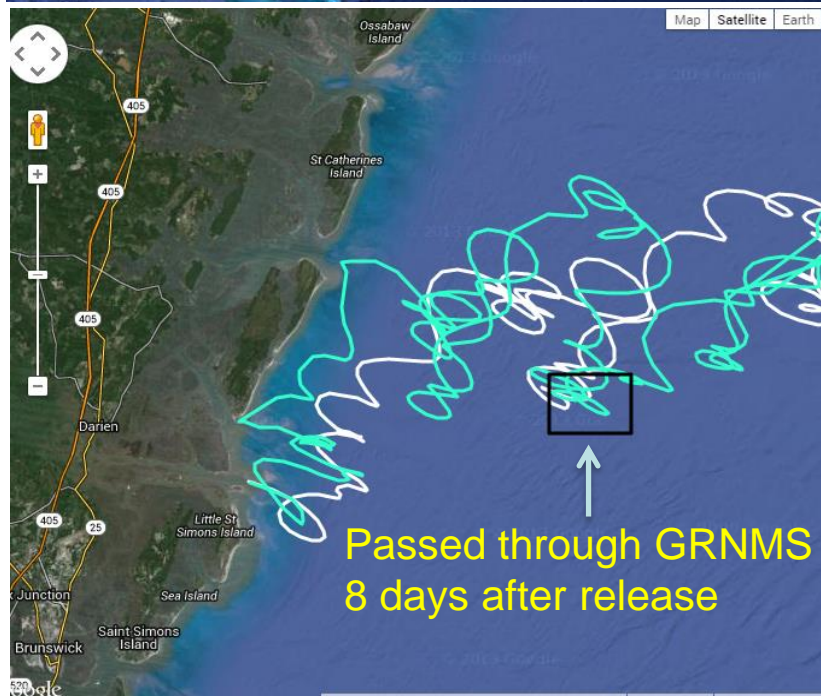
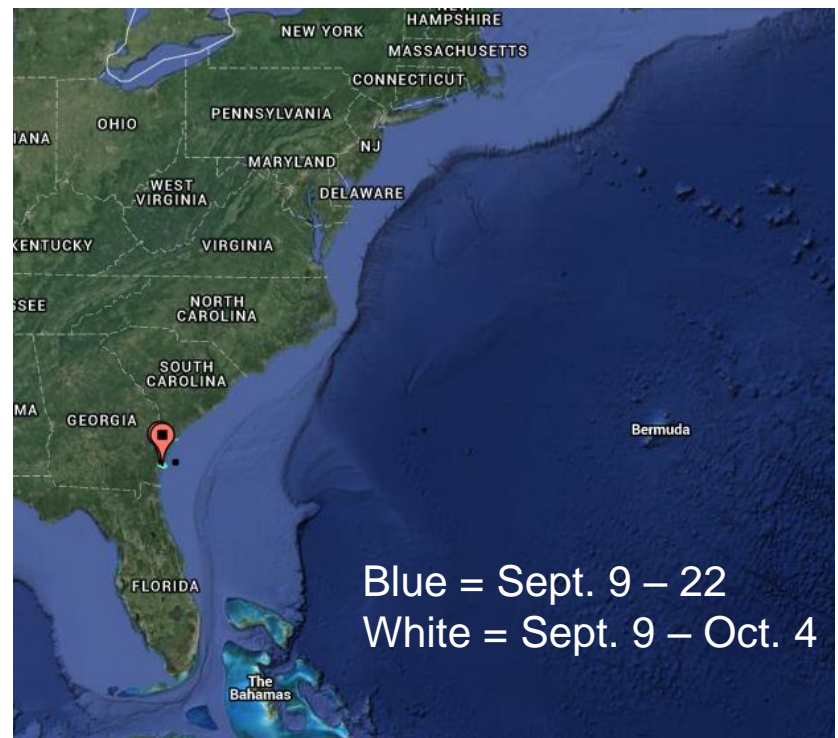
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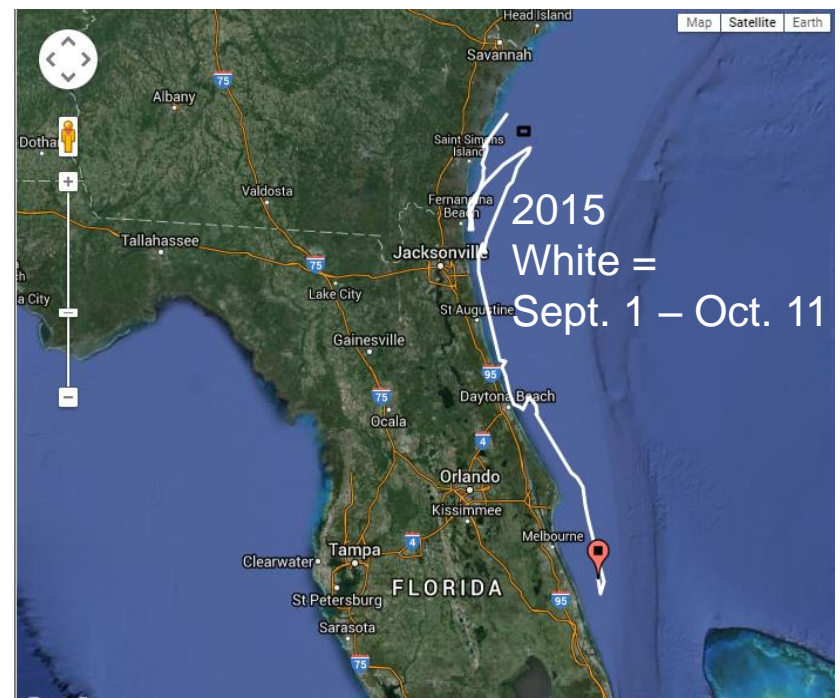
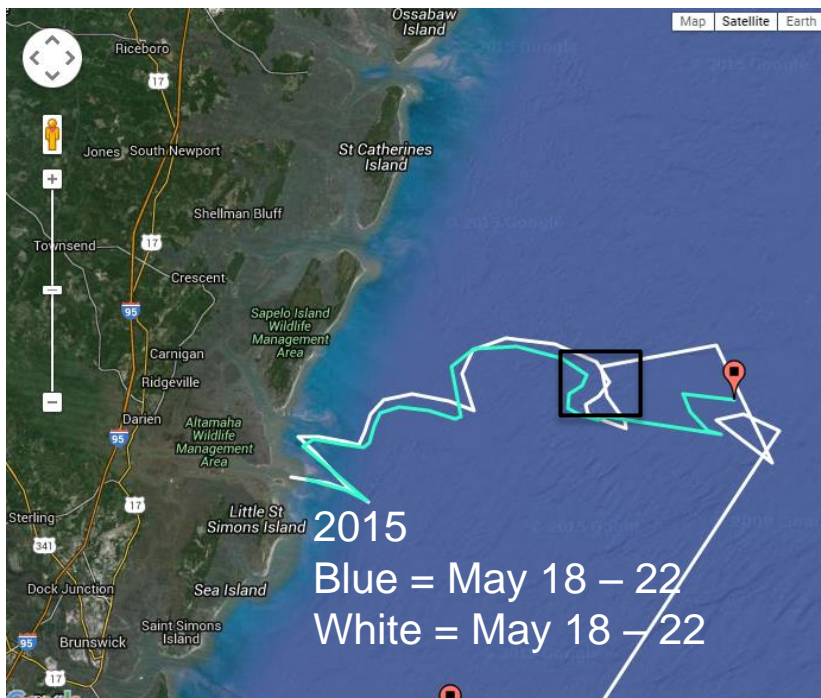
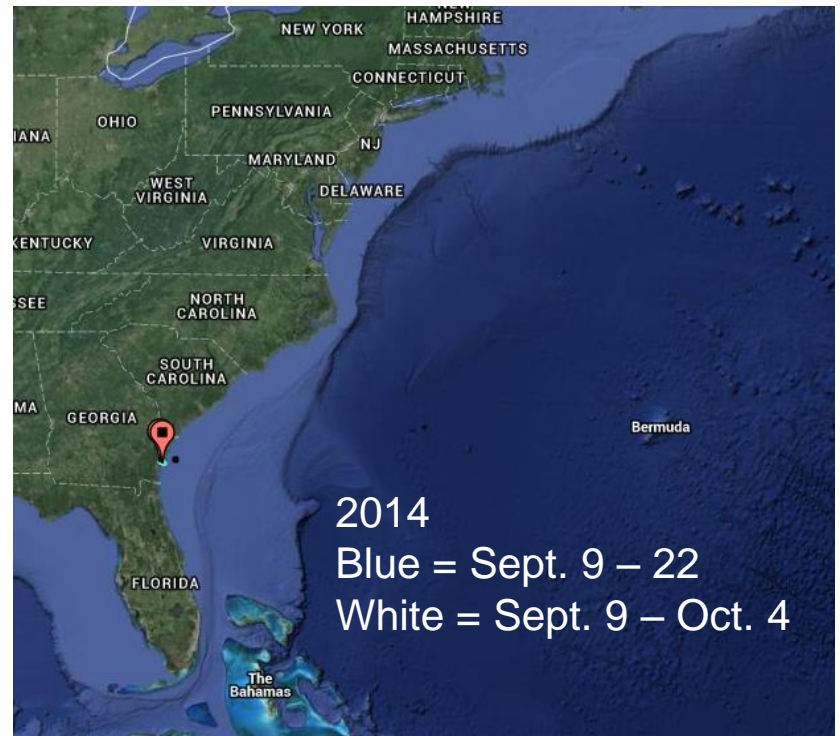
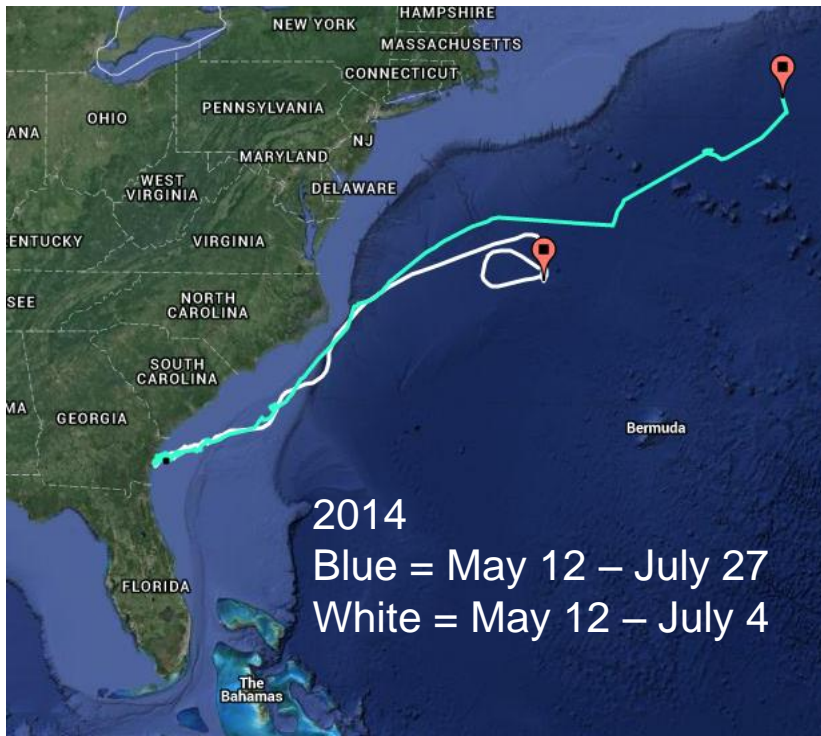




What about the drifters?

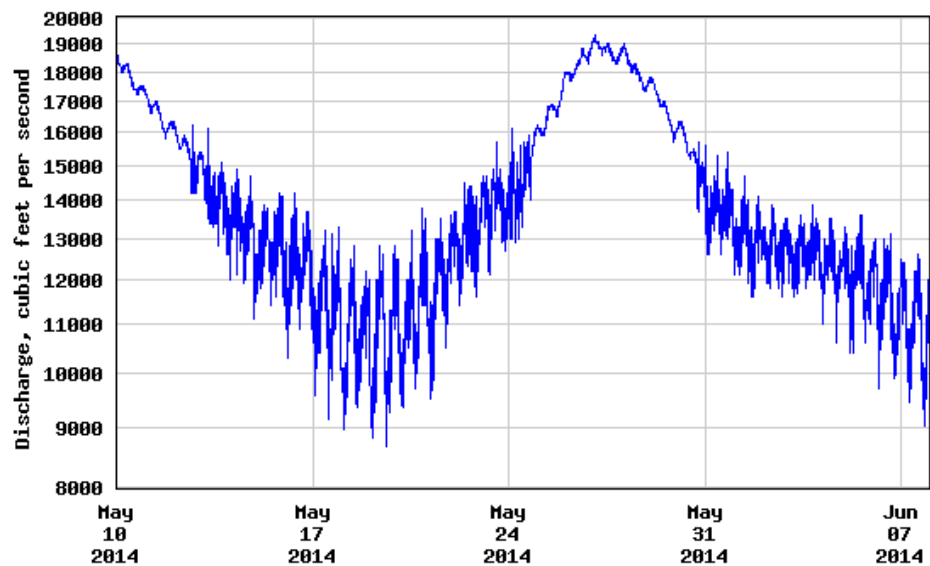








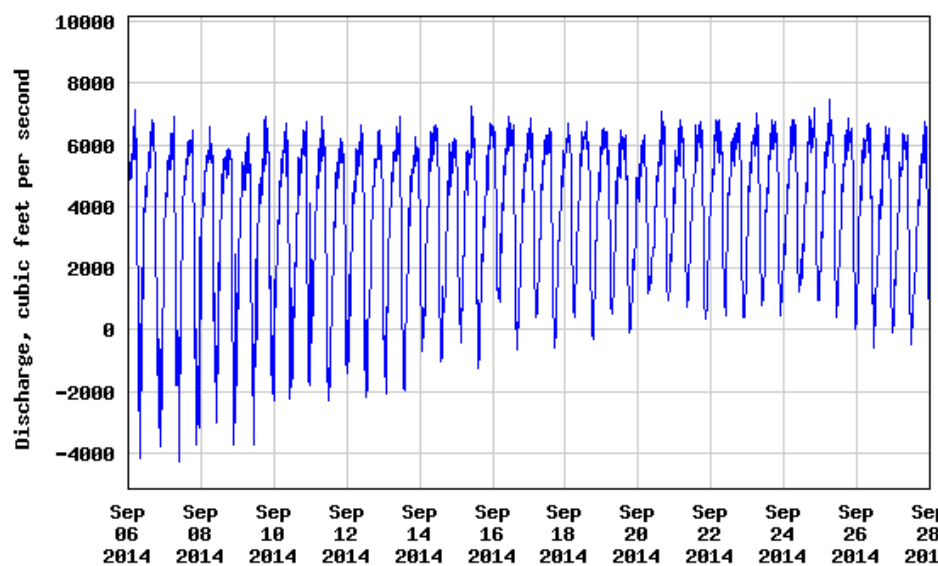
USGS 02226160 ALTAMAHA RIVER NEAR EVERETT CITY, GA



---- Provisional Data Subject to Revision ----



USGS 02226160 ALTAMAHA RIVER NEAR EVERETT CITY, GA

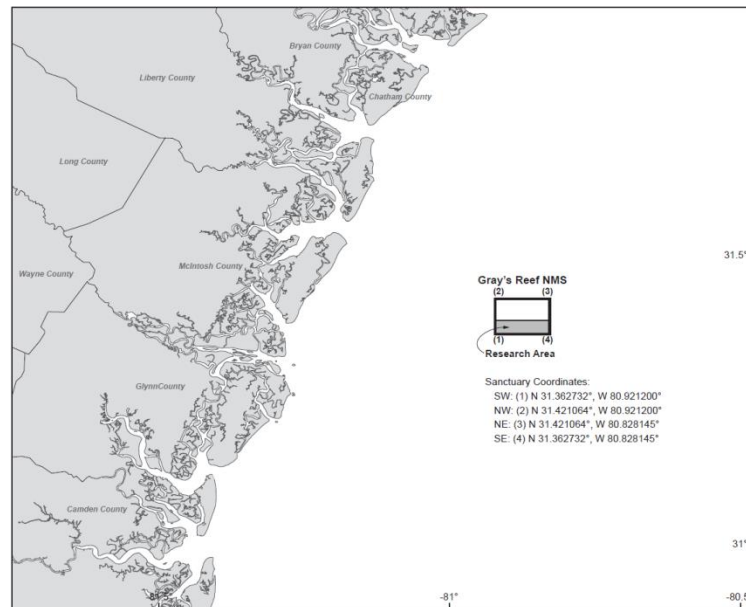


---- Provisional Data Subject to Revision ----

Summary

Directionality and speed of transport from Altamaha River Estuary

- Southeast at 1-1.8 km/h in first 5-6 h after dye and drifter release.
- Varies with river discharge rates.
 - Spring, high discharge rates = offshore transport
 - Fall, low discharge rates = estuarine retention



Hypothesis

- Hard bottom reef communities in coastal Georgia are sustained by subsidies from salt marsh estuaries.
 - Prediction: Physical linkages between estuaries and reefs exists.

Depends on prevailing conditions.



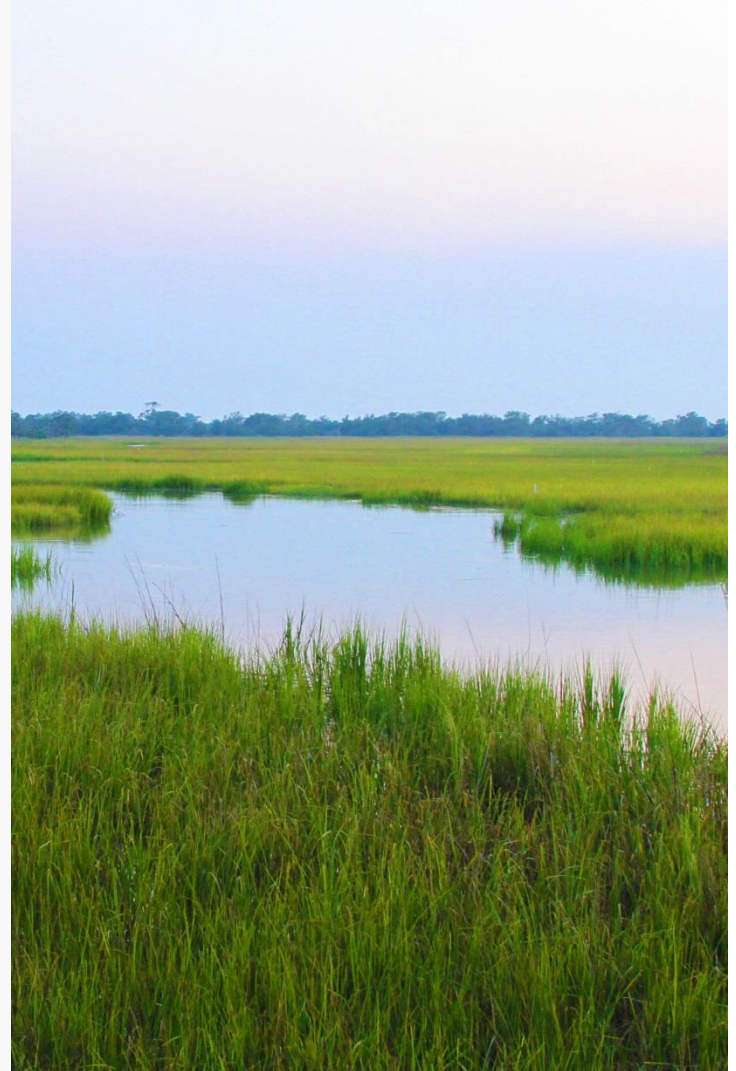
Acknowledgements

- Lab and Field Assistance
 - Martina Balzarova, Marina Osier, Stefan Petersen, Alicia Reigel, Steven Riera, Donald Schneider, Lauren Stefaniak, Brianne Varnerin
- Logistical Support:
 - Todd Recicar and Jared Halonen (GRNMS), Judy Helme (Miss Judy Charters)
- Funding:
 - Coastal Incentive Grant from Georgia Department of Natural Resources Coastal Resource Division

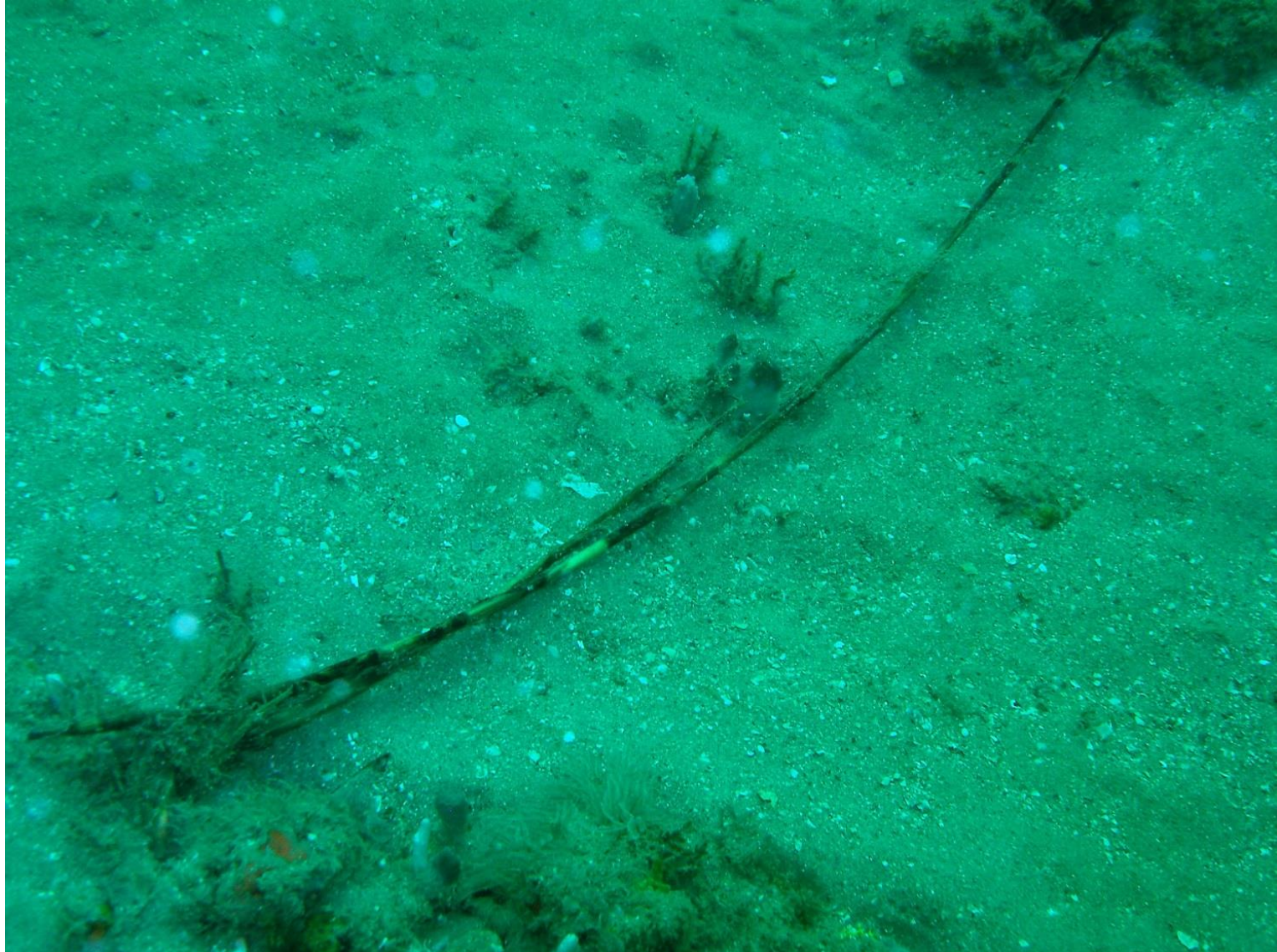


Outwelling Hypothesis

Eugene Odum (1968)



But observations indicated:



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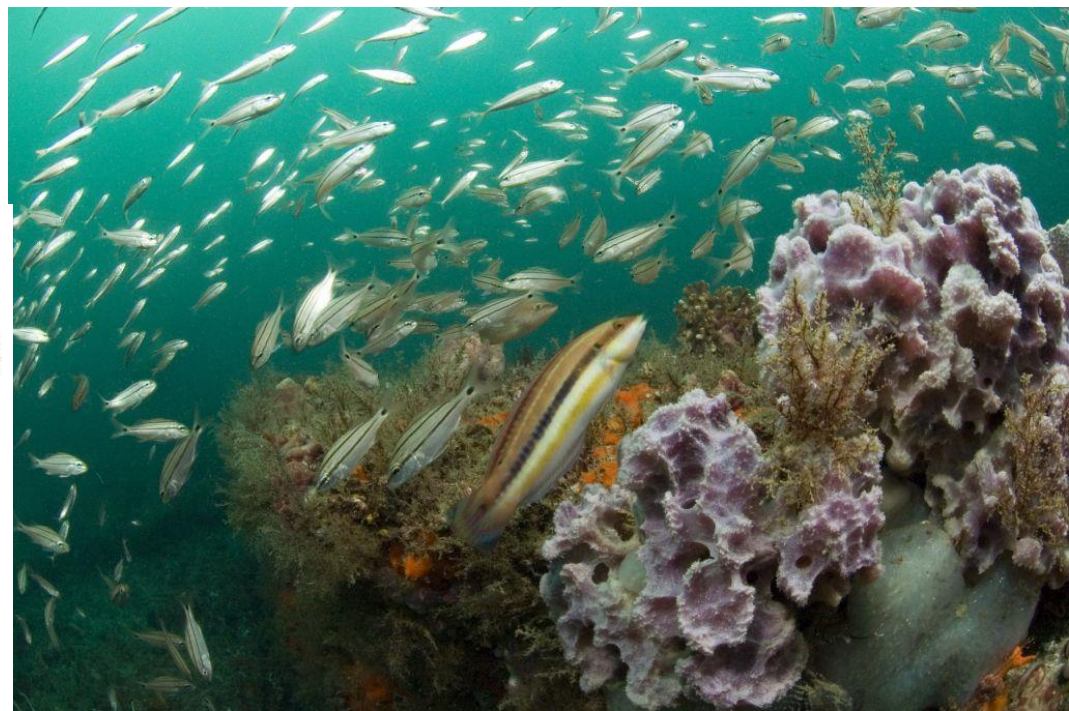
Entire drifter
database
available online

Hypothesis

- Hard bottom reef communities in coastal Georgia are sustained by subsidies from salt marsh estuaries.
 - Prediction: Physical linkages between estuaries and reefs exists.



South Atlantic Bight



Photos by G. McFall

