
CORMP
COASTAL OCEAN RESEARCH AND MONITORING PROGRAM
UNCW
Coastal Ocean Research and Monitoring Program at the University of North Carolina at Wilmington
Dr. Lynn Leonard, Director
Jennifer Dorton, Outreach & Education
Funded by the National Oceanic and Atmospheric Administration
UNCW
NC STATE UNIVERSITY
SOUTH CAROLINA

1998 Congress determined the need for an Integrated Ocean Observing System (IOOS)

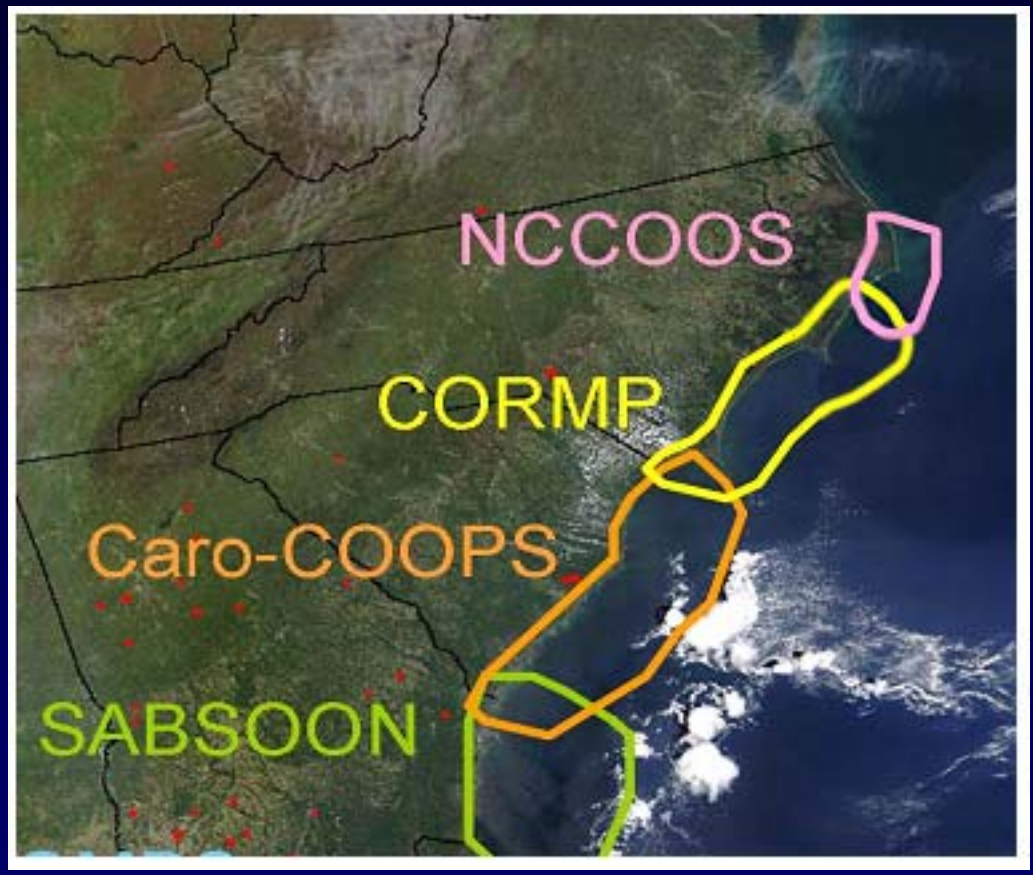
- Improve the safety & efficiency of marine operations
- Improve homeland security
- Mitigate effects of natural hazards
- Improve predictions of climate change
- Minimize public health risks
- Protect & restore coastal marine ecosystems
- Sustain living marine resources

U.S. Coastal Observing System Regions

http://www.csc.noaa.gov/coos/

Southeast Observing Systems

- Each observing program is affiliated with a research institution.
- In the Southeast, the South East Coastal Ocean Regional Association (SECOORA) will oversee the ocean observing programs.



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CORMP:

- NOAA grant funded
- established in 2000 at UNCW
- Conduct year-round coastal research off Southeastern NC
- Interdisciplinary program
- Work collaboratively with USC & NCSU

NOAA UNCW NC STATE UNIVERSITY UNIVERSITY OF SOUTH CAROLINA

Goals for CORMP

- to become a full-featured coastal ocean observing system (Real-time Data!)
- to provide a science-based framework for wise coastal use
- to engage community groups and provide them with the timeliest, most useful information possible

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Offshore Observing Network

2 - NDBC Design

- Weather Observations
- Current speed & direction
- Turbidity
- Water temperature
- Salinity
- NDBC buoys also transmit standard wave data
- Buoys transmit data via satellite

2 - NC State Design

Buoy Deployments

ILM2 & ILM3 deployed June 6, 2005

Buoy Deployments

LEJ2 deployed
Aug 1, 2005

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Pier-Based Observing Network

- Instruments are deployed and hard-wired to local fishing piers.
- Transmit real-time marine weather and oceanographic data.
  - waves (height, direction, frequency)
  - currents
  - bottom temperature
  - salinity
  - water level (tide)

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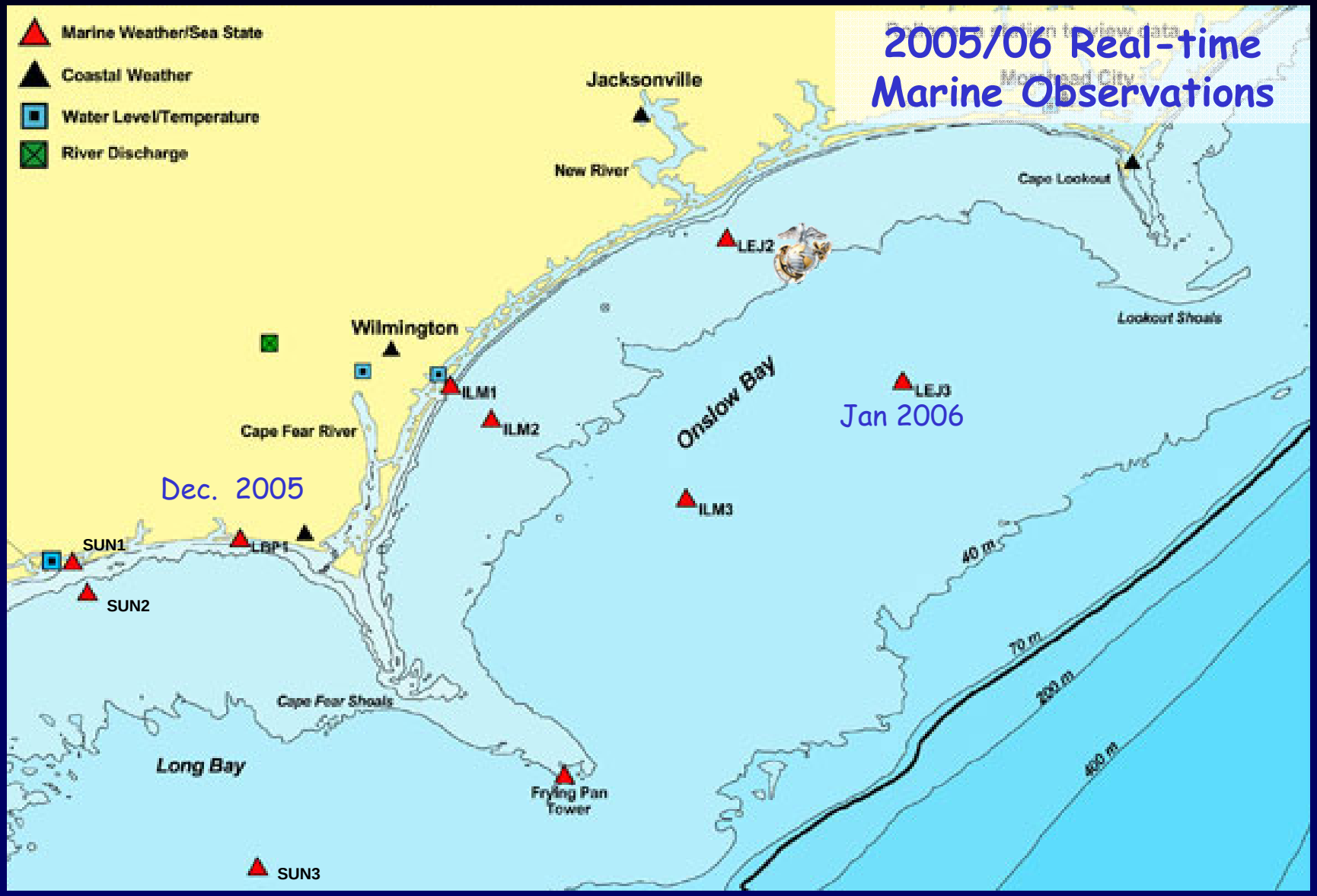

Access buoy data

- www.cormp.org
- www.carocoops.org
- National Data Buoy Center
  www.ndbc.noaa.gov
- NOAA weather radio
- Dial-a-buoy
- NWS-ILM Marine Weather Page
  www.erh.noaa.gov/ilm/marine

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CORMP Research Objectives

To use information from fixed moorings and other instruments to:

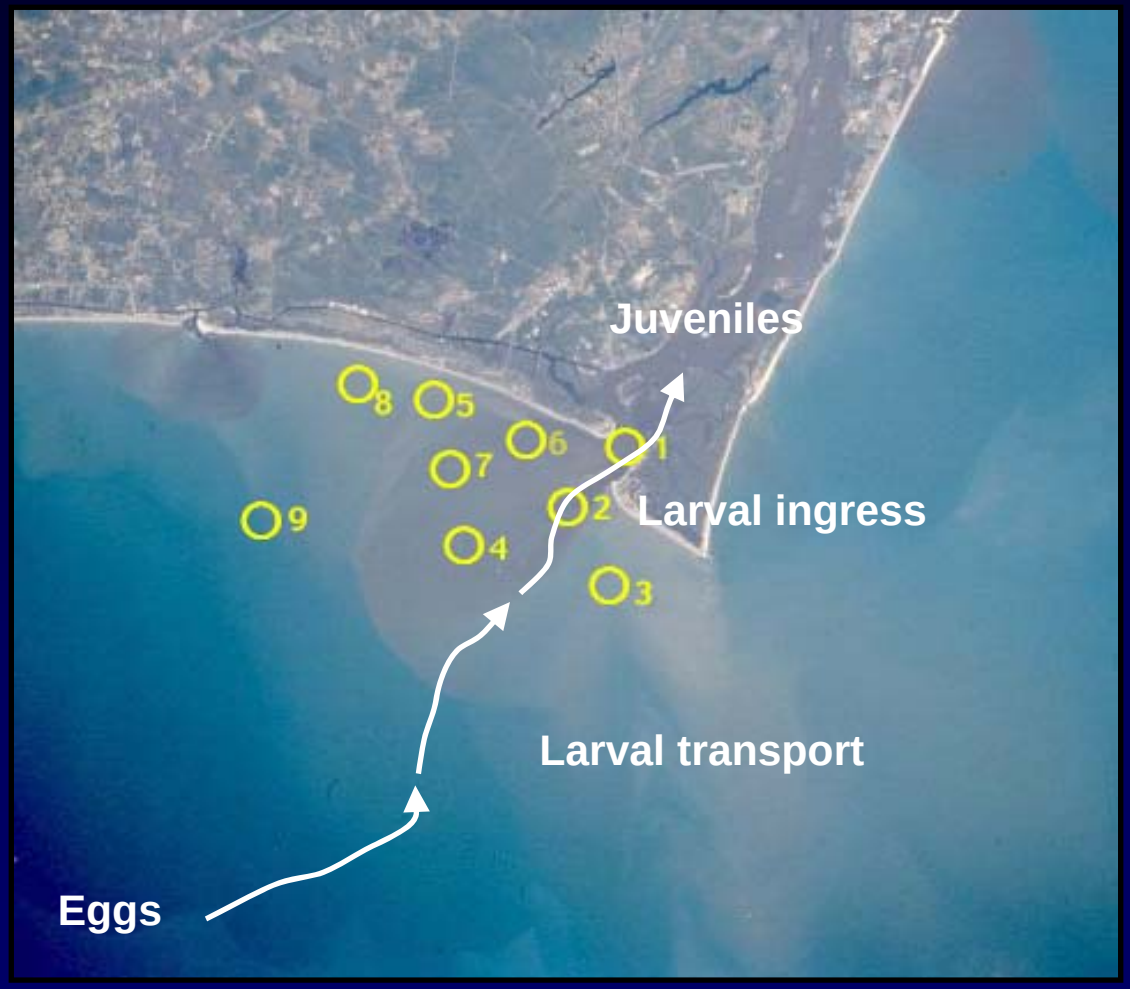
Identify how water quality of the Cape Fear River plume impacts fisheries ecosystems

Improve our understanding of storm impacts from the coastline to the continental shelf

What is a Plume?

- Plumes occur where river water enters the ocean
- Recognized by a change in water color due to material in the river water
- Plumes may transport nutrients, sediments, and toxic materials to the coastal ocean
- Plume boundaries vary depending on winds, waves, and currents and the type of material in the plume water

Role of the CFR Plume on Fisheries Production



Determine the CFR plume's effects on fisheries habitat quality

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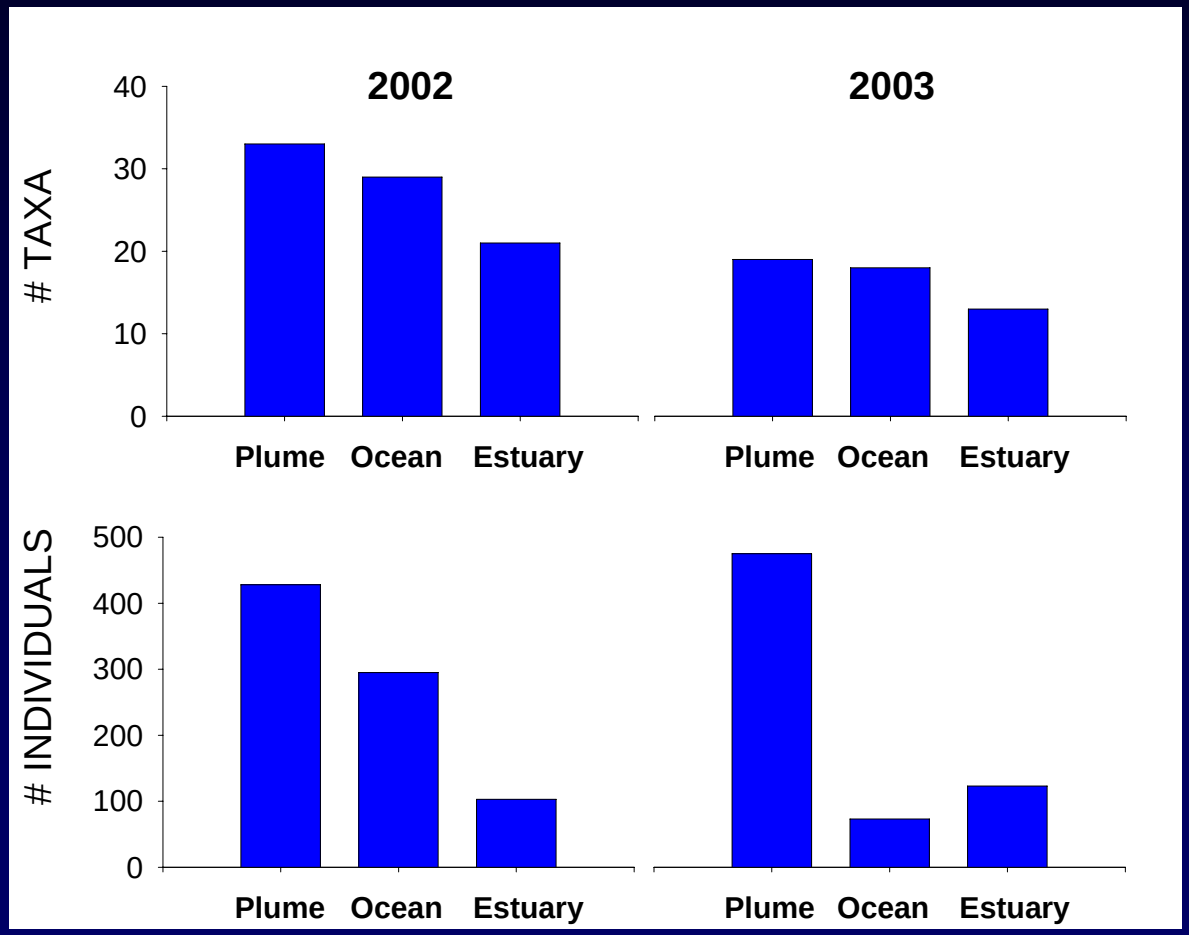
Support for Fisheries Management

- NC Div. of Marine Fisheries (NCDMF), uses CORMP plume abundance data to:
  - open and close the shrimp fishery
  - revise the NC blue crab management plan
- National Marine Fisheries Service (NMFS) & South Atlantic Fisheries Management Council use CORMP data for coastal habitat conservation needs inventories
- CORMP data are used to refine SE Atlantic bluefish stock assessments

Top Commercial Fisheries	2001 Landings (million dollars)	Plume-impacted
Blue crab	32.0	***
Shrimps	11.9	***
Southern flounder	5.6	***
Atlantic menhaden	4.6	***
Summer flounder	4.4	***
Atlantic croaker	3.1	***
King mackerel	1.3	
Swordfish	1.3	
Spot	1.3	***
Mullets	1.2	***
Vermillion snapper	1.2	
Bluefish	1.1	***
Oysters	1.1	
Seabasses	1.1	
Weakfish	1.0	***
	($72,000,000)	

Fish Species Diversity & Abundance vs. Habitat



Diversity & abundance enhanced in the plume *(better survival)*

Size/individual is greater in the plume *(more food)*

In terms of fish abundance, the plume may be better defined by optical water quality than by salinity ***(catch more fish along visible plume edge!)***

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Monitoring our Ocean

Operations team deploying the "Rosette" off the *R/V Cape Fear*. The rosette measures water temp, salinity, dissolved oxygen and takes water samples at multiple depths.

Food Chain Dynamics

- Nutrients are more abundant in plume, but less light reaches the bottom than in Onslow Bay
- In Onslow Bay, sufficient light for photosynthesis reaches the bottom up to 40 km offshore
- So, primary producers (base of food chain) are more abundant in the water column in the plume and on the bottom in Onslow Bay.
- We hypothesize that this distribution of food resources affects ecosystem dynamics

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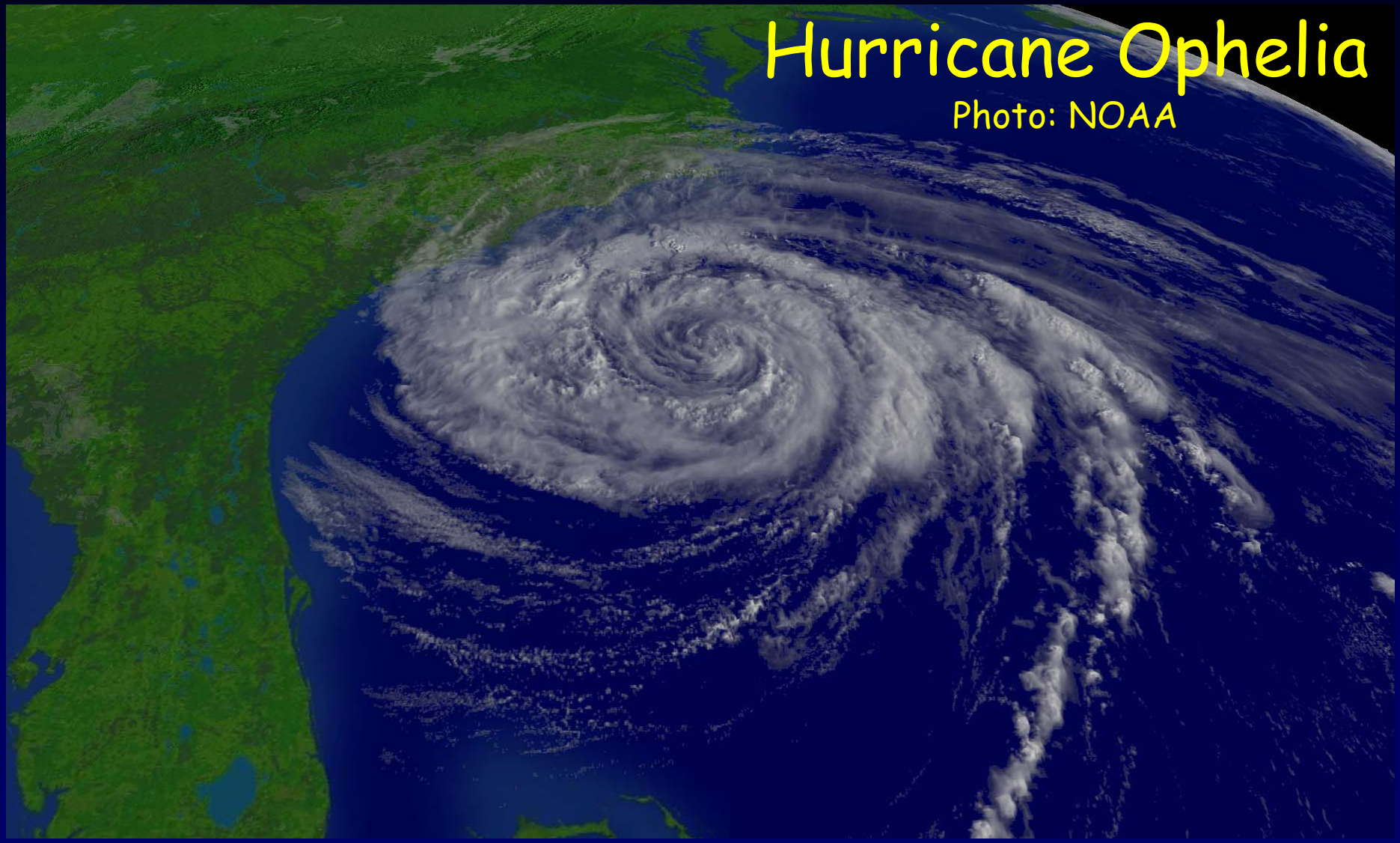
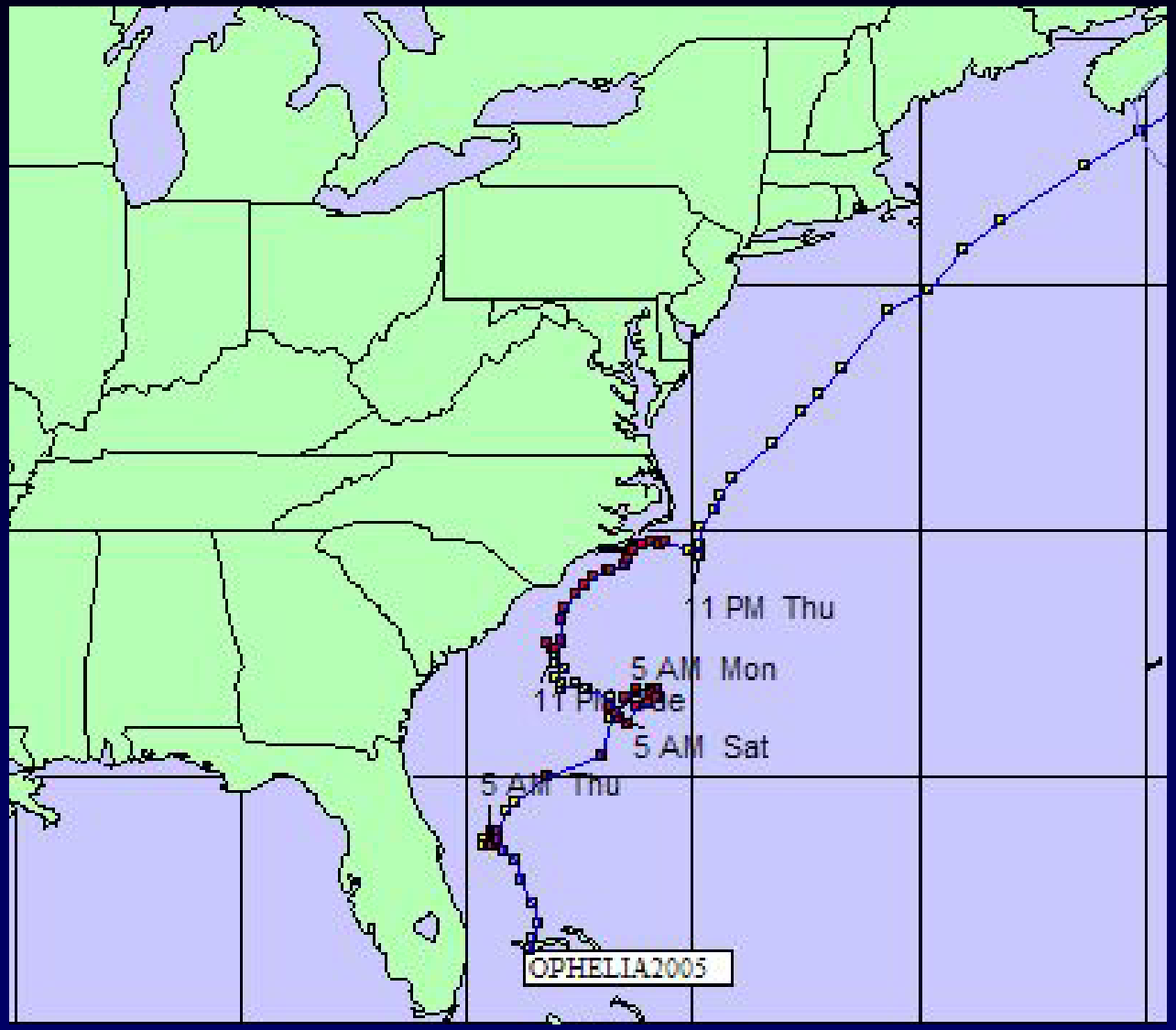


Hurricane Ophelia

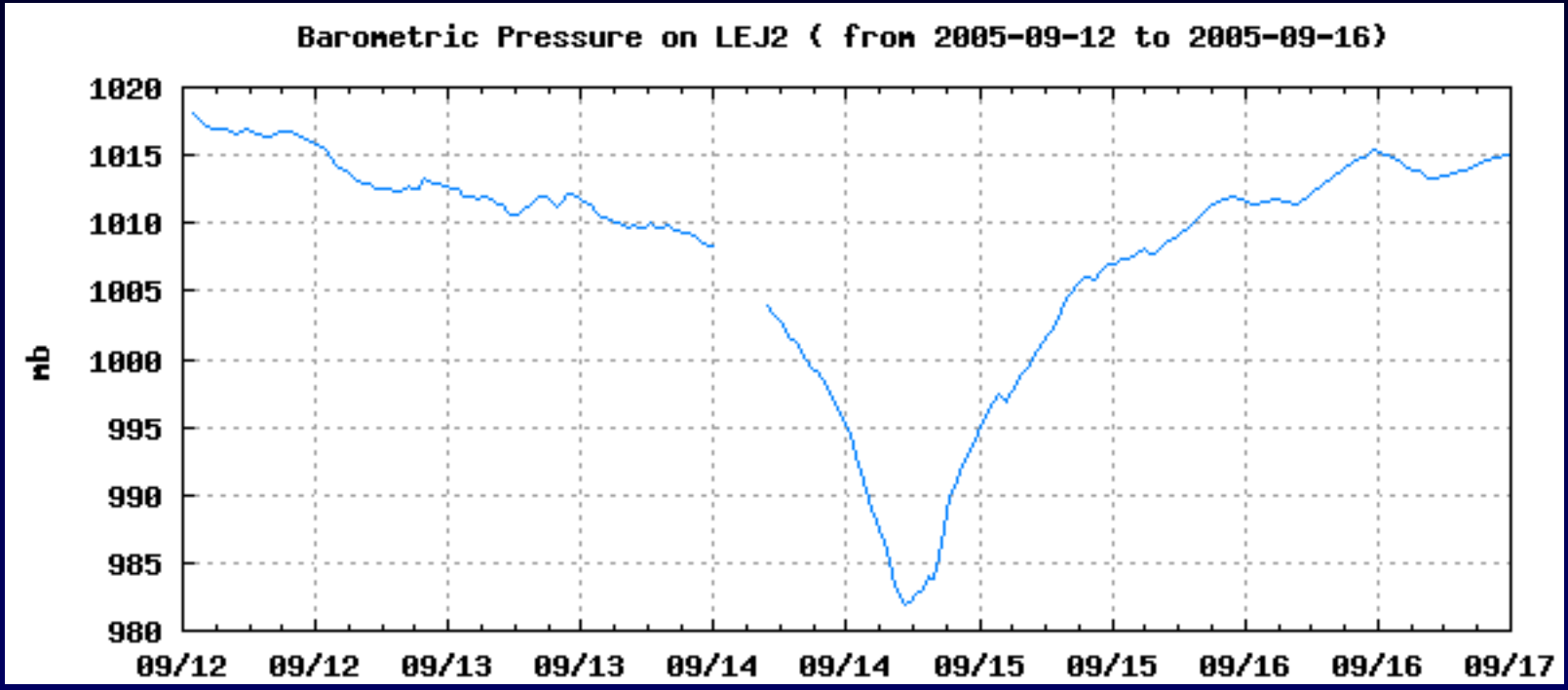
Photo: NOAA



Ophelia storm track

Storm passed close to Jacksonville during the late afternoon an evening on Wed, Sept 14

Hurricane Ophelia



Air pressure significantly decreased as the eye of the storm passed close to LEJ2, dropping down to 983 mb between 6:00 and 9:00 p.m. on 9/14/05.

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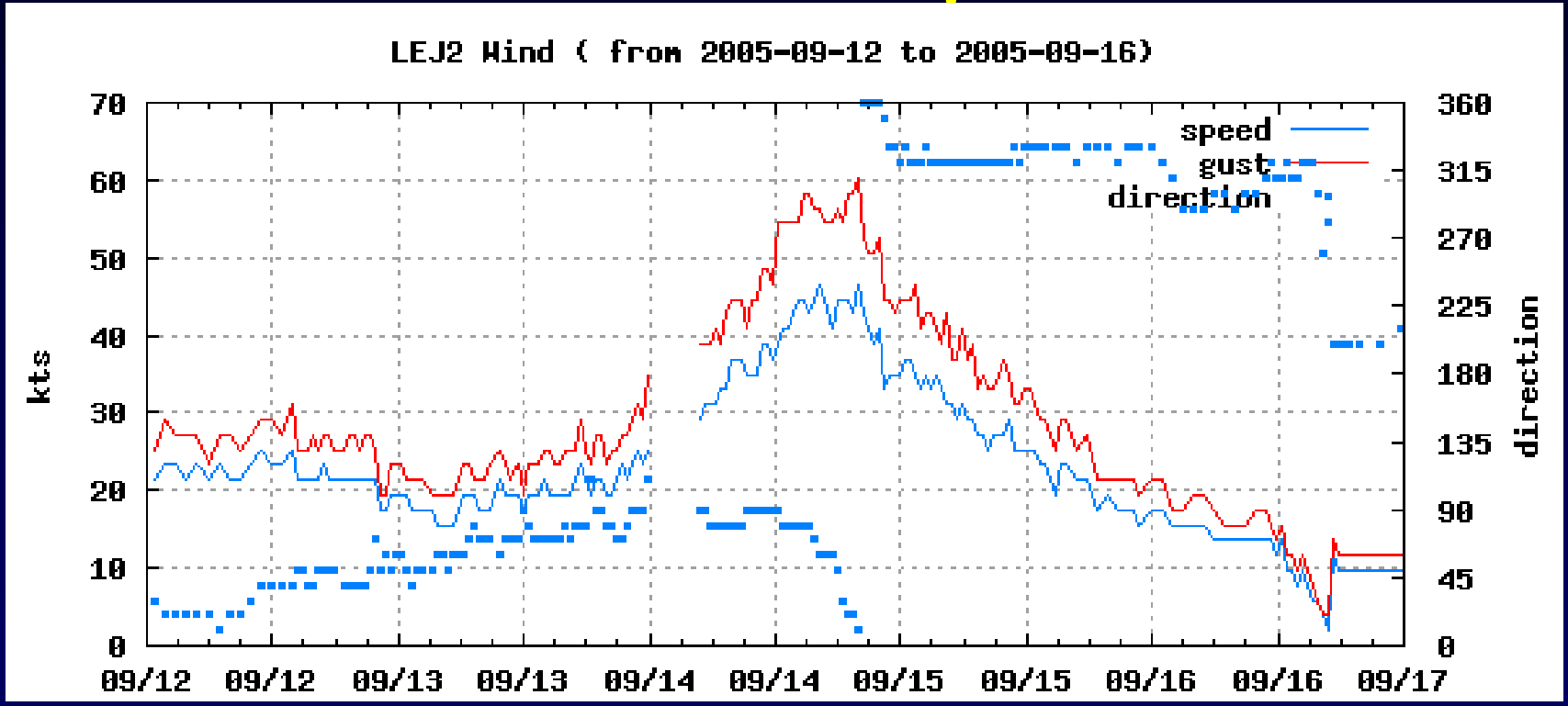
Hurricane Ophelia



Max sustained: 45 kts
Max gust: 60 kts
Wind direction shift at 9:00 p.m. on 9/14 (eye passed)

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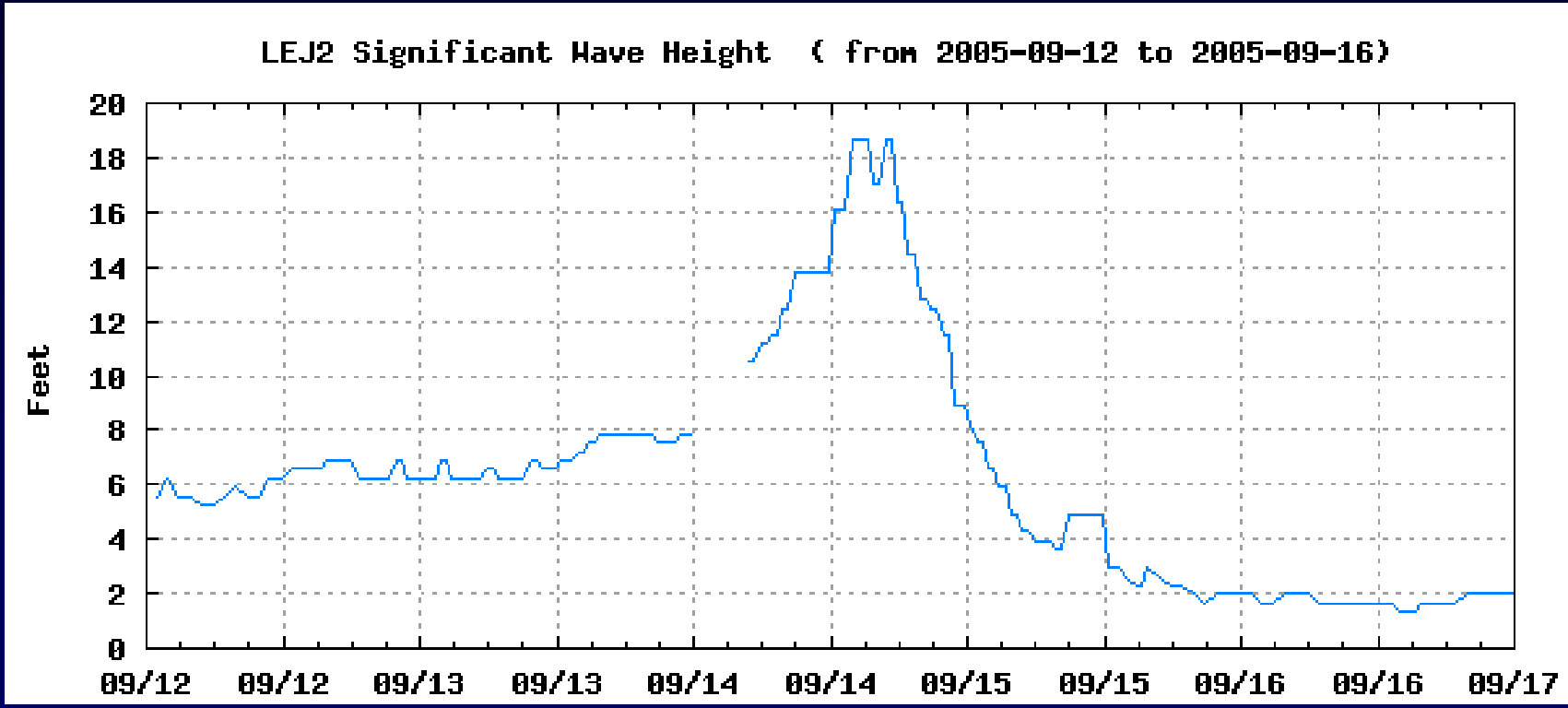
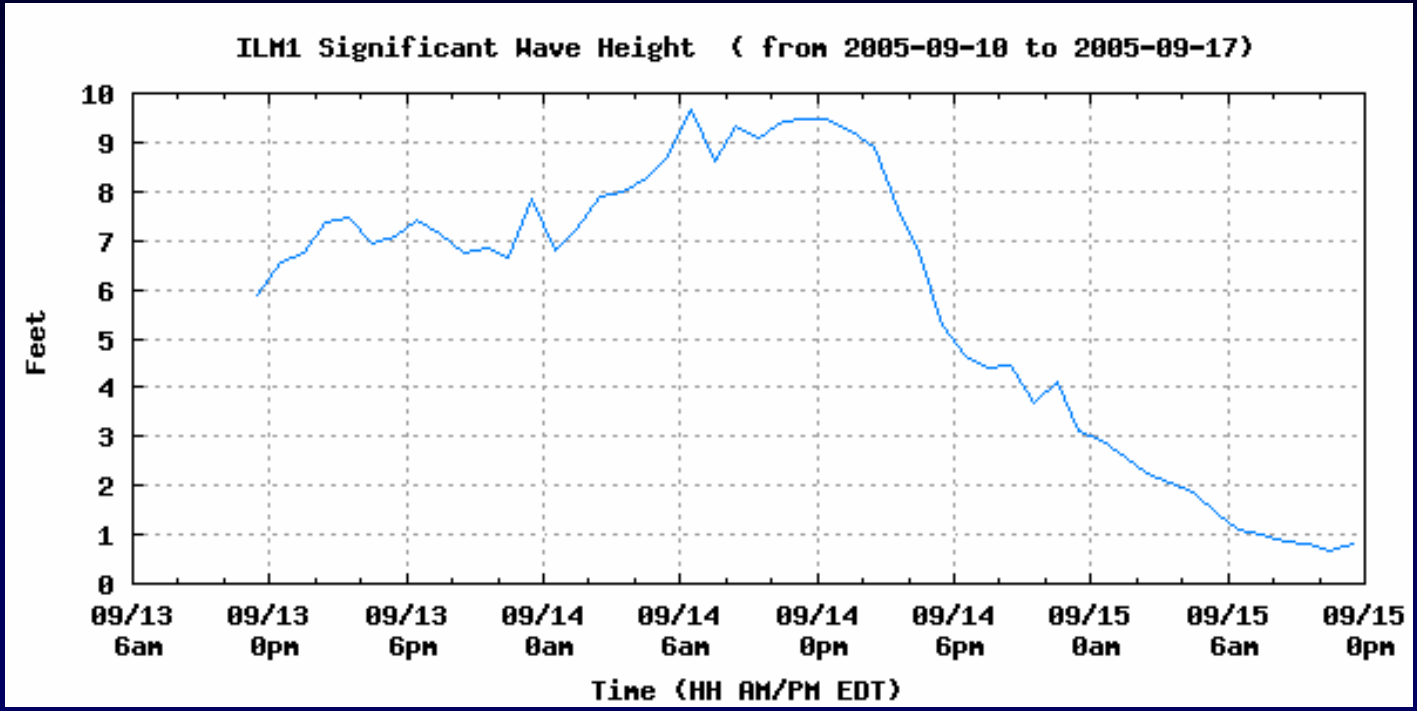
Hurricane Ophelia



LEJ2 sits in approximately 55 feet of water
Max wave height 19 ft (4 hour period)

Hurricane Ophelia



At Johnnie Mercer's Pier, SW of LEJ2, max wave height was 9 ft. Wave height less than LEJ2 due to proximity to storm and shoaling of waves.

Hurricane Ophelia

LEJ2 sustained a small amount of damage after the storm.

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Pelagia Autonomous Glider

1st deployment Sept 2005

Preparing to dive

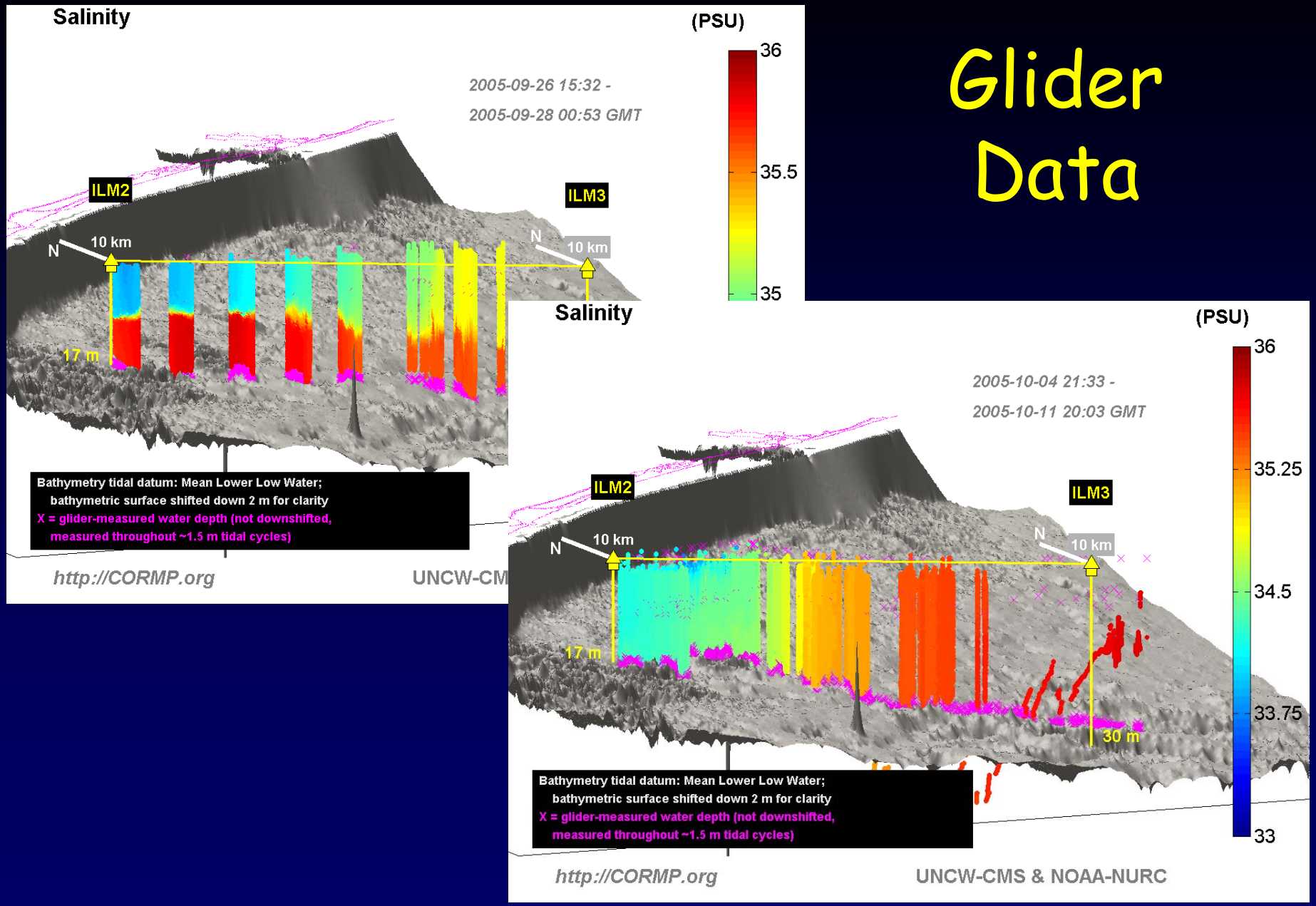
The glider is pre-programmed with a course to follow and can be deployed for up to 30 days. It calls home every 4 hours to check in and send data back.

Pelagia Autonomous Glider

Glider recovery

During the first deployment, the glider continuously measured (24 hours a day) water temperature, salinity, chlorophyll and turbidity in Onslow Bay, NC for 19 days after Hurricane Ophelia.

Glider Data


Salinity
(PSU)
36
35.5
35
2005-09-26 15:32 -
2005-09-28 00:53 GMT
ILM2
ILM3
N
10 km
N
10 km
17 m
Salinity
Bathymetry tidal datum: Mean Lower Low Water;
bathymetric surface shifted down 2 m for clarity
X = glider-measured water depth (not downshifted,
measured throughout ~1.5 m tidal cycles)
http://CORMP.org
UNCW-CM
(PSU)
36
35.25
34.5
33.75
33
2005-10-04 21:33 -
2005-10-11 20:03 GMT
ILM2
ILM3
N
10 km
N
10 km
17 m
30 m
Bathymetry tidal datum: Mean Lower Low Water;
bathymetric surface shifted down 2 m for clarity
X = glider-measured water depth (not downshifted,
measured throughout ~1.5 m tidal cycles)
http://CORMP.org
UNCW-CMS & NOAA-NURC

Potential Benefits

- Increased observations = more informed and safer marine community
- Improved inshore & offshore marine forecasting and improved rip current forecasting by the NWS
- Improved and more cost-efficient beach renourishment
- Improved understanding of how water quality affects fisheries ecosystems to support management of recreational and commercial fisheries.

Ongoing Challenges

- Sustained Funding
- Sensitive electronic instrumentation in sometimes very hostile environments
- Data Acquisition, Management and Dissemination
- Infrastructure to support program expansion
- Increased outreach and public awareness; partnerships

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Questions?

Caro-COOPS

MARINES
THE FEW. THE PROUD.

NOAA

NATIONAL WEATHER SERVICE

NC STATE UNIVERSITY

US Army Corps of Engineers
Wilmington District

North Carolina Department of Environment and Natural Resources
NCDENR

UNCW