







CORMP
COASTAL OCEAN RESEARCH AND MONITORING PROGRAM




**Coastal Ocean Research and Monitoring
Program at the University of North
Carolina at Wilmington**

**A Collaborative Coastal Ocean
Research And Monitoring Program**






Funded by the National Oceanic and
Atmospheric Administration



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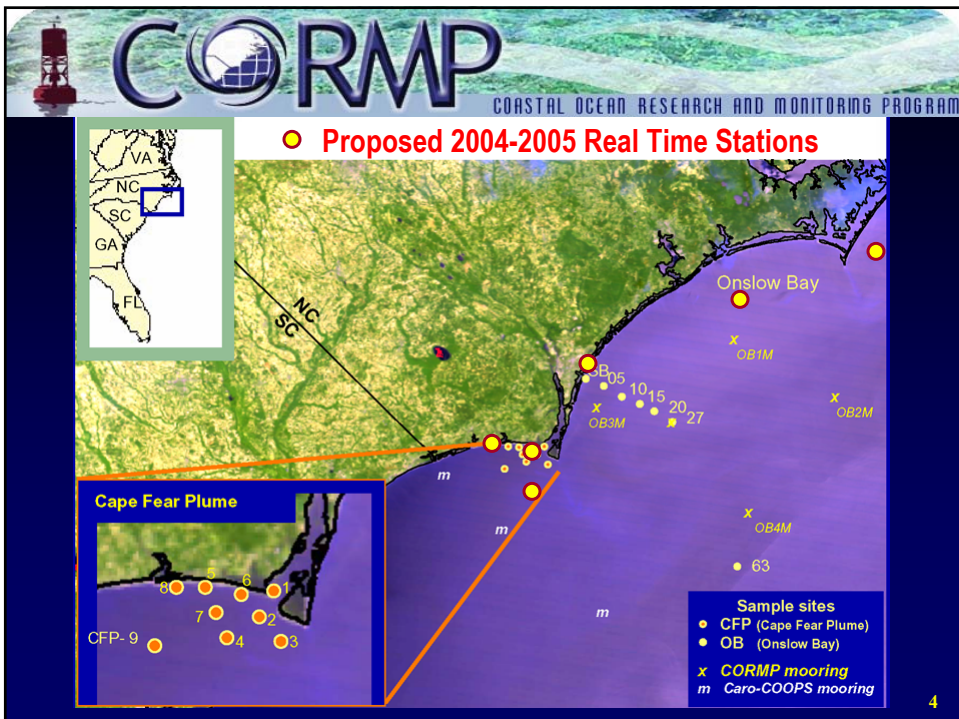
- Since 1999, UNCW has conducted a sustained, long-term program of coastal ocean observations and research off North Carolina.
- Interdisciplinary research program includes physical oceanography, marine biology, chemical oceanography and marine geology.
- A collaborative program at UNCW with NC State & University of South Carolina



Goals

- to become a full-featured coastal ocean observing system
- to provide a science-based framework for wise coastal use
- to be a regional node in a national system of coastal observatories
- to engage local and regional user groups and provide the timeliest, most useful dataset possible

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By the end of 2005, we will have:

Six sites in Long Bay: a three station line along the extended NC/SC border, two moorings in the Cape Fear River plume and one instrumented fishing pier

Three sites in Onslow Bay, one instrumented pier, one in mid-shelf and one near New River inlet

One site in Raleigh Bay

Plus CMAN stations at Frying Pan Shoals and Cape Lookout

CRAY

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Each site will report in real time, approximately hourly:

Current profiles

Temperature and salinity

Meteorological data (winds, air temp, etc.)

Some with fluorescence and turbidity

Wave directional spectra

Data will be quality-controlled and available for free on the web (www.cormp.org)

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Bi-monthly, Monthly, and other Sampling Cruises:

Water Quality (Turbidity, Nutrients, etc.)

Physical parameters (Temp, Salinity & Currents)

Sea floor characteristics

Bioptical measurements

Primary productivity

Fisheries



**CFR Discharge Plume and Fisheries Recruitment:
Aggregation and Trophic Enhancement**



Also supported by:



Sampling Methods

Neuston Net

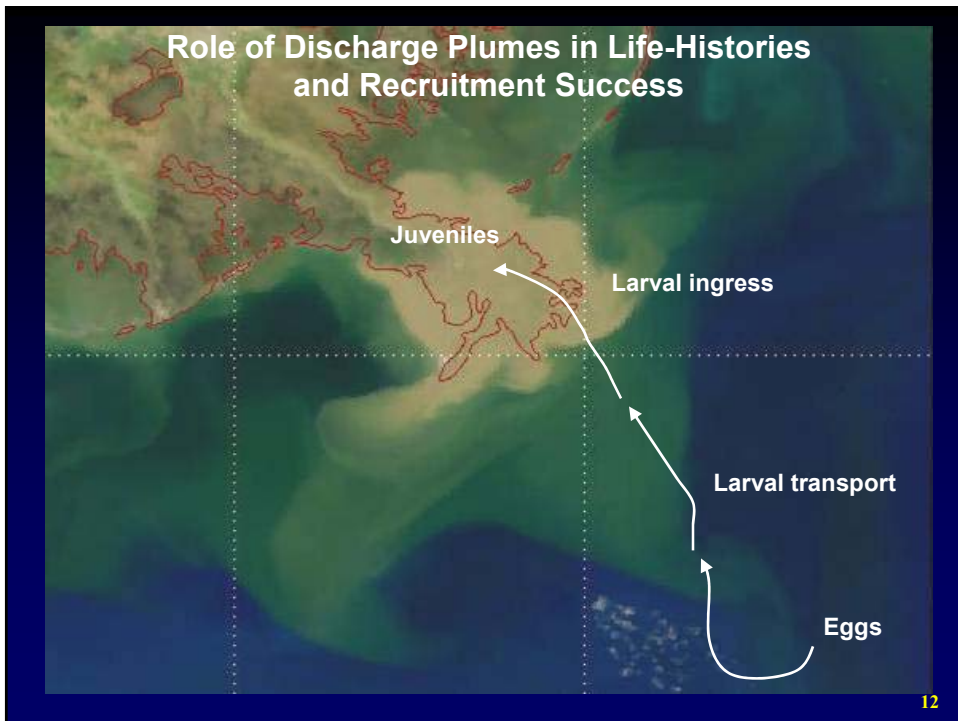
- 950 μm mesh net
- 1 m X 2 m mouth opening
 - 10 minutes @ ~ 2 knots
 - half in/half out at surface

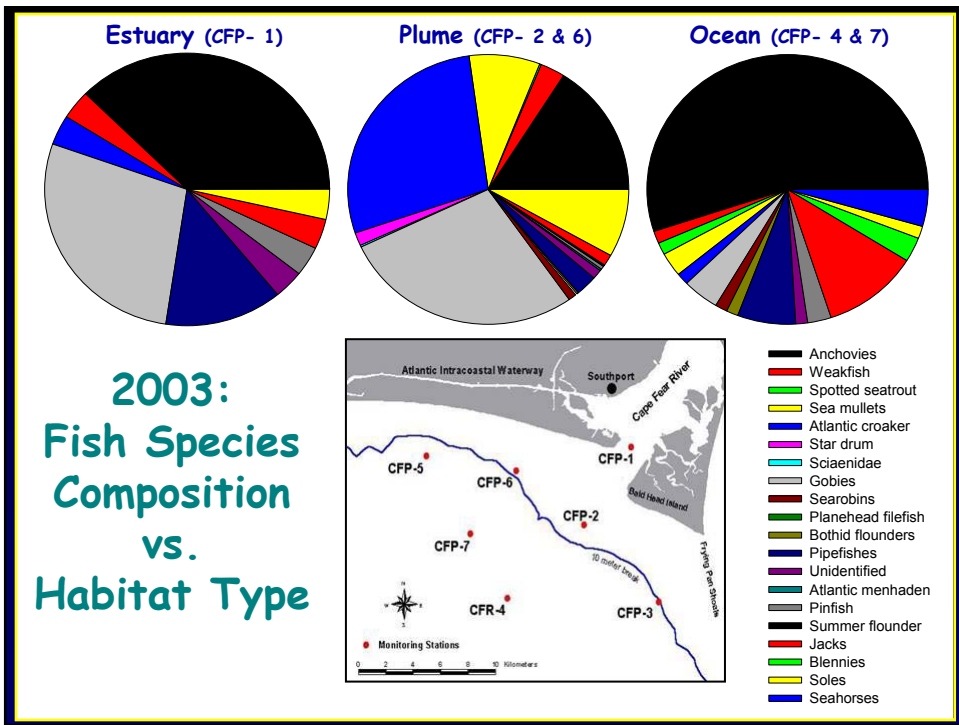
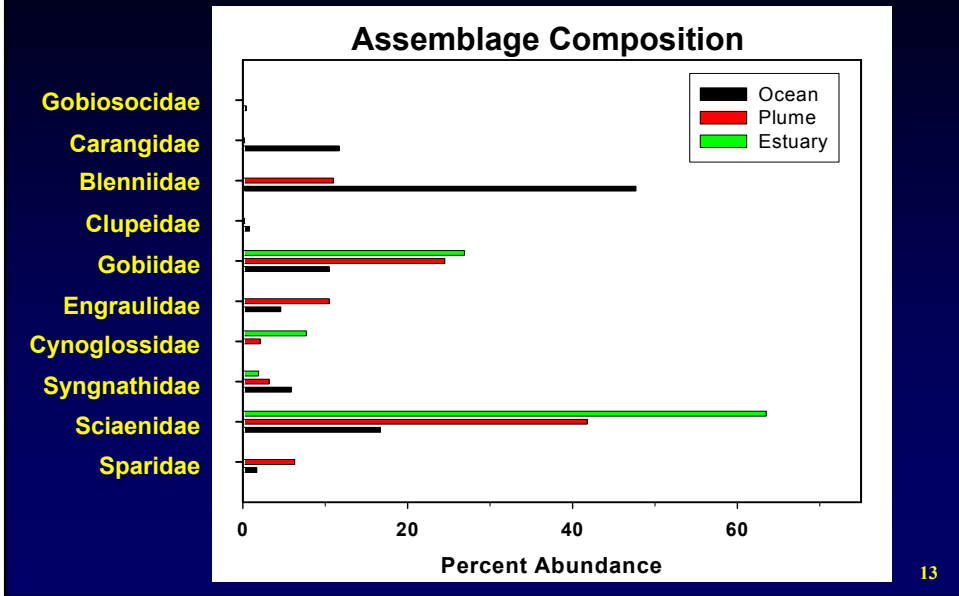
Bongo Net

- 333 μm mesh net
- 60 cm diameter mouth openings
 - 5-10 minutes @ ~ 1.5 knots
 - stepped oblique pattern
- Deployed to ~10 m from bottom, or 100 m at GS



<u>Top N.C. Commercial Fisheries</u>		2001 Landings (million dollars)	Plume- impacted ?
(\$72,000,000)	1. Blue crab	32.0	****
	2. Shrimps	11.9	****
	3. Southern flounder	5.6	****
	4. Atlantic menhaden	4.6	****
	5. Summer flounder	4.4	****
	6. Atlantic croaker	3.1	****
	7. King mackerel	1.3	
	8. Swordfish	1.3	
	9. Spot	1.3	****
	10. Mulletts	1.2	****
	11. Vermillion snapper	1.2	
	12. Bluefish	1.1	****
	13. Oysters	1.1	
	14. Seabasses	1.1	
	15. Weakfish	1.0	****





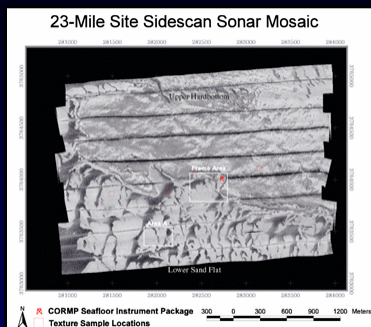
Boundary Layer Processes and Sediment Transport on the Continental Shelf

Quantification of wave/current boundary layer processes and sediment mobility during fair weather and storms;

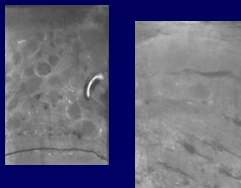
- Examination of the Cape Fear River plume's influence on the composition and distribution of inner shelf sediments;
- Identification of interactions between physical processes and primary and secondary consumers.

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Data Collection Efforts



Sidescan mapping

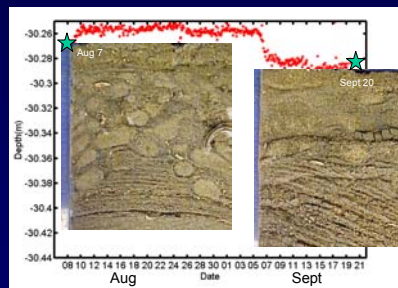


X-radiographs

Box cores
& relief
peels

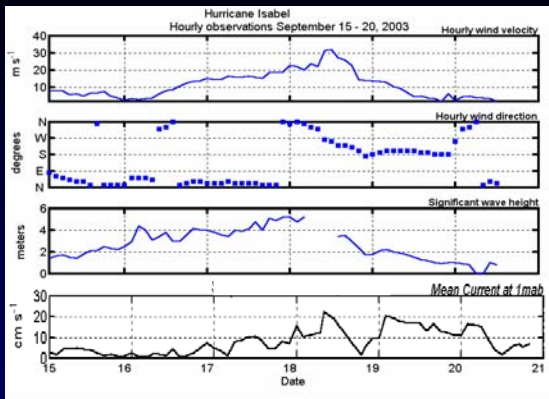


Moored Instruments



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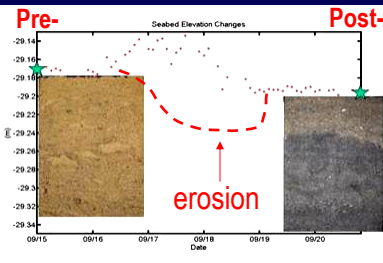
Documented Effects of Hurricane Isabel on shelf...



Max wave height ~ 6m

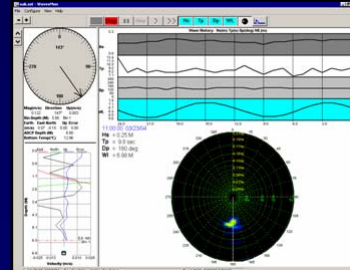
Max bottom current ~ 20 cm/s

~ 4 cm net erosion of sea bed
 ~ 5 cm storm deposition
 ~ 9 cm total reworking by storm
 (region where most infauna reside)



New research directions for FY2004-2005:

- Collection of coastal meteorological and wave/current data on the inner shelf (< 12m water depth)
- Characterization of coastal wave climate and associated coastal erosion;
- Providing wave and meteorological data in real time

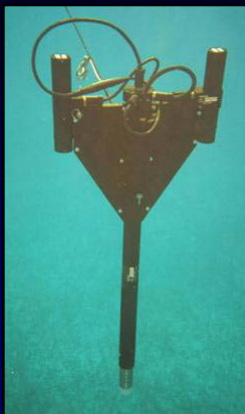


Remote Sensing & Optics

- Extrapolate in-situ data collected during cruises to larger spatial and temporal scales, providing a regional context for interpreting in-situ monitoring data
- Monitor long-term regional patterns in chlorophyll and primary production, and their relationships to environmental conditions
- Determine location and extent of shelf waters influenced by the turbid Cape Fear River blackwater plume
- Relate optical environment to larval and benthic monitoring results and primary production measurements.

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Optical Measurements

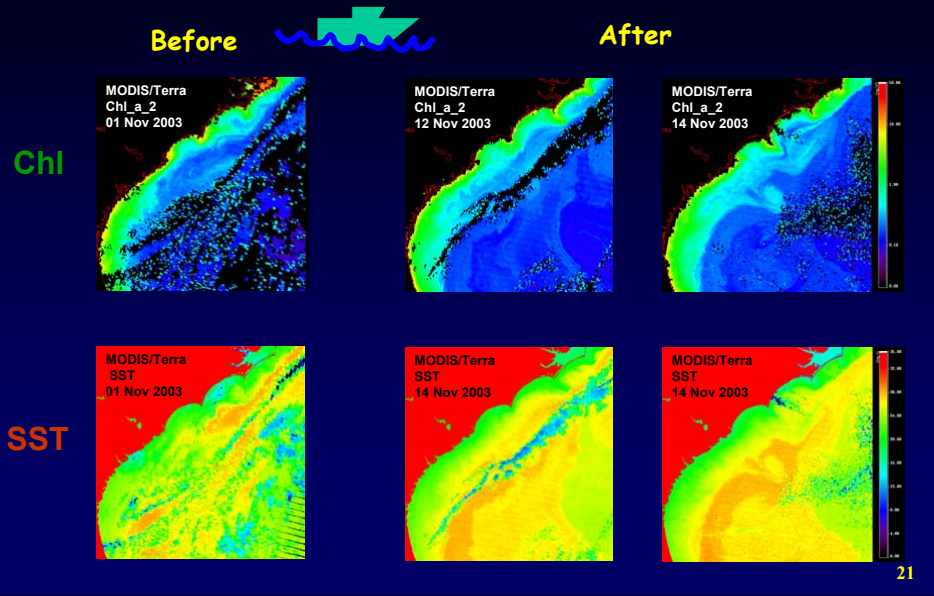


Surface and profiling reflectances at SeaWiFS wavelengths

The Micropro (left, photograph by courtesy by Satlantic Inc., Canada) and MicroSAS (Kowalczyk, et al., 2004)

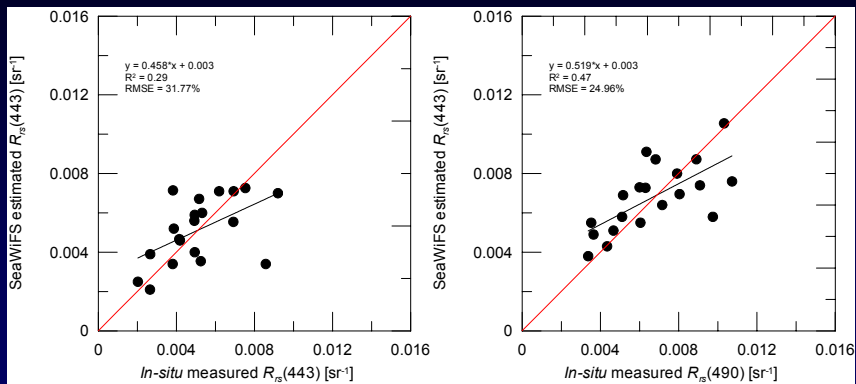
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MODIS images before and after November 2003 fieldwork



Satellite ground-truthing

Comparison between remote sensing reflectances measured in-situ and estimated from SeaWiFS imagery data



(Kowalczuk, et al. 2004)

Alternate atmospheric correction strategies for coastal satellite data are under investigation to improve quantitative retrieval of ocean color reflectances from satellite

Ongoing and new program directions:


Satellite algorithm development:

- Evaluate alternative atmospheric correction algorithms for quantitative retrieval of water-leaving reflectances from ocean color satellite data (in collaboration with Rick Stumpf at NOAA and Bob Arnone & Paul Martinolich at NRL)
- Develop local algorithms for calculating chlorophyll and light attenuation from remote sensing satellite reflectances

Primary production measurements:


Determine spatial and temporal patterns in primary production using in-situ fast repetition rate fluorescence measurements

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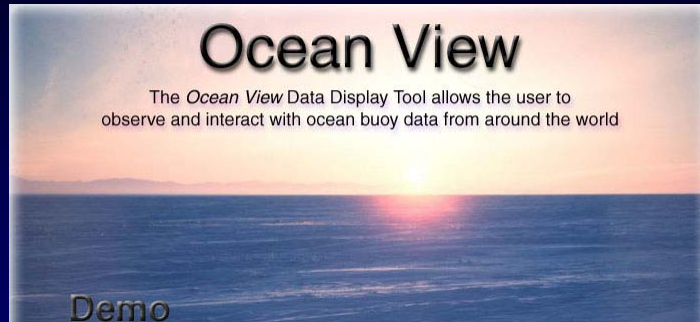
Educational Outreach

Graduate and Undergraduate Research Experiences



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GK-12 Education and Web-based Learning



Thank you!