

An aerial photograph of a coastal wetland system. A prominent, winding river or estuary flows through the center of the frame, surrounded by vast, flat marshlands. The water in the river is a deep blue, while the surrounding marshes are a mix of brown and green, indicating different vegetation and sediment levels. The overall scene is a complex network of waterways and landforms.

Coastal Ocean Observing Systems: An Academic's Perspective

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Capitol Hill Oceans Week 2003

What is my experience in observing systems?

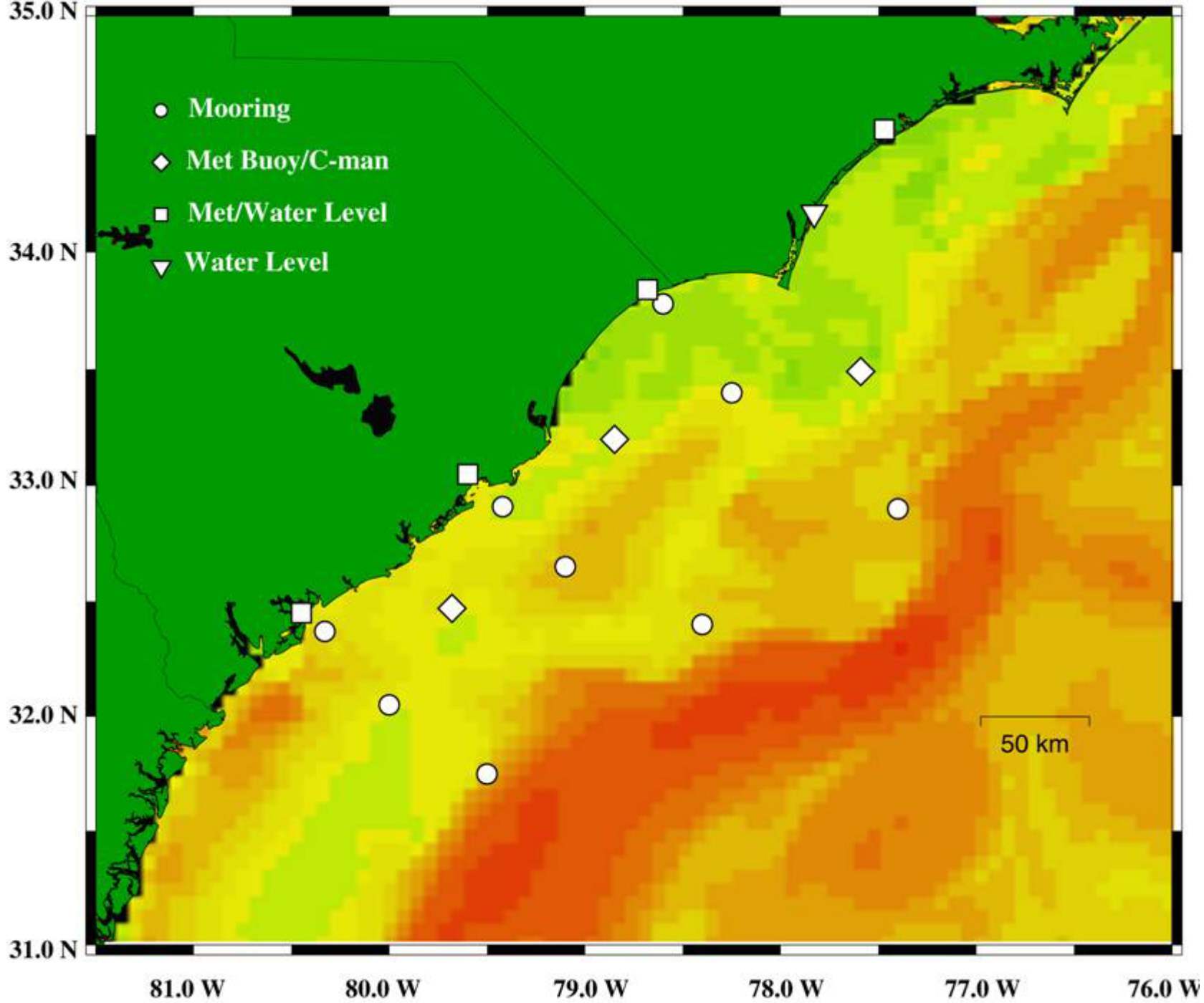
- P.I. for Carolinas Coastal Ocean Observing and Prediction System (Caro-COOPS);
- A Co-P.I. for Southeast Atlantic Coastal Ocean Observing System (SEA-COOS);
- Director of Baruch Institute, headquarters for the North Inlet/Winyah Bay National Estuarine Research Reserve and the Centralized Data Management Office of the national NERRS program.

The Carolinas Coastal Ocean Observing and Prediction System (Caro-COOPS)

**A Partnership Among the University
of South Carolina, North Carolina
State University, and the University
of North Carolina-Wilmington**

**Funded by the National Oceanic
And Atmospheric Administration**





A satellite-style map of the Southeast Atlantic coastal region, showing the coastline of North America and the surrounding ocean. The land is depicted in shades of green and brown, while the ocean is in various shades of blue. The text is overlaid on the map.

SEA-COOS

The Southeast Atlantic Coastal
Ocean Observing System

- National IOOS
- Regional observing systems

SEA-COOS partners and in-kind collaborators

Partners

University of North Carolina

University of South Carolina

Skidaway Inst of Oceanography

University of Miami

University of South Florida

NCSU (Sea Grant)

South Carolina Sea Grant

University of Georgia (Sea Grant)

University of Florida (Sea Grant)

South Carolina Department of Natural Resources

NCSC/MCNC

In-kind collaborators

Naval Surface Warfare Center/USN

CO-OPS/NOS/NOAA

NAMOC/USN

National Data Buoy Center /NOAA

NCEP/NWS/NOAA

Florida Keys National Marine Sanctuary/NOS/NOAA

Atlantic Oceanographic and Meteorological Laboratory/NOAA

NCDDC/NOAA

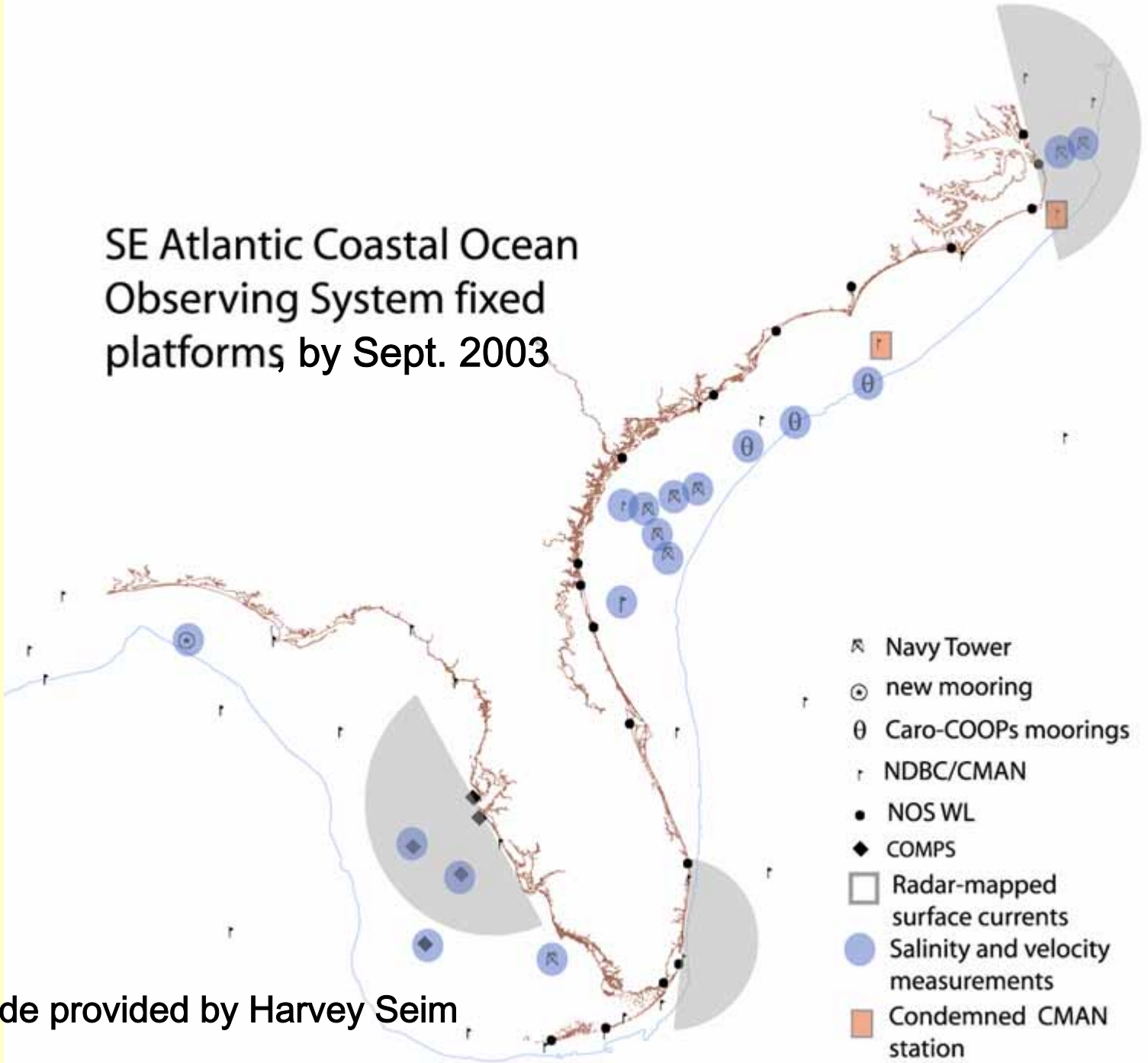
Jacksonville and Miami Regional NWS Offices/NOAA

Field Research Facility/USACE

Southeast Fisheries Science

Center/NMFS/NOAA

SE Atlantic Coastal Ocean Observing System fixed platforms by Sept. 2003



Slide provided by Harvey Seim

Major challenges in establishment of the IOOS

- Building the necessary partnerships to
 - Share, integrate, and transport large volumes of diverse data from disparate systems for analysis and synthesis;
 - Collaborate and integrate with federal “backbone”;
 - Build productive connections with the large variety of potential users of information and provide them with effective tools and products;
- Developing the scientific understanding and technologies required to address biological systems;
- Securing the resources for a sustained IOOS that provides continuous information for the long term.

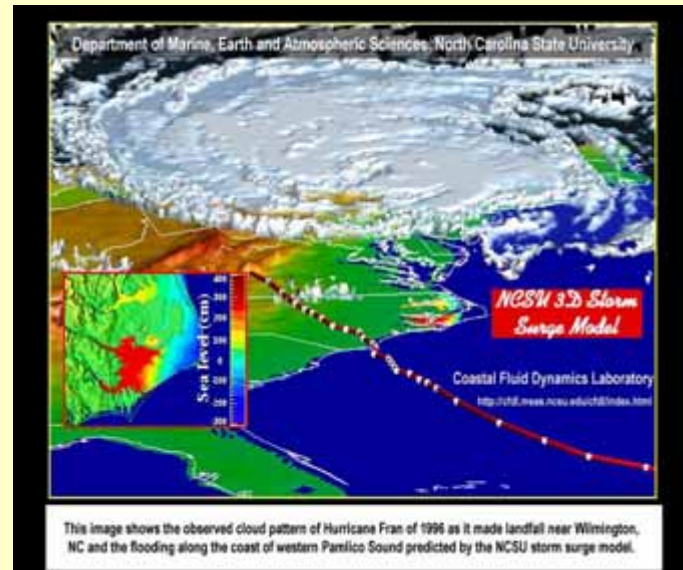
Building the necessary partnerships to:



–Share, integrate, and transport large volumes of diverse data from disparate systems for analysis and synthesis: requires high degree of coordination, establishment of national/international standards, new data management tools, & commitment to participate.

–Collaborate and integrate with federal “backbone” : Good examples are the NOAA NOS CO-OPS NWLON and the NOAA NDBC.

–Build productive connections with the large variety of potential users of information – e.g., emergency and coastal resource managers, climatologists, ports and security personnel -- and provide them with products for local and regional applications.



Storm Surge Flooding Animation Demo

TopoBat

- Topography & Bathymetry

Political

- County boundaries
- State boundaries
- City names
- Major SC roads
- Interstates
- US routes no labels
- US routes with labels
- all other roads

Surge

- Category 1
- Category 2
- Category 3
- Category 4
- Category 5



Storm surge prediction and response requires partnering at scientific, government, and community levels.

Developing the scientific understanding and technologies required to address biological systems

Critical Issues Affecting Biological Resources and Human Health Include:

- Alerts for anomalous conditions, such as temperature and salinity extremes, hypoxia, & harmful algal blooms;
- New information relevant to fisheries, e.g. essential fish habitat conditions related to nursery grounds, dispersal of eggs & larvae;
- Conditions affecting survival and dispersal of pathogens.

These are extraordinarily complex phenomena that require sophisticated scientific approaches to analyze active components, controls, and consequences.

The technologies of IOOS

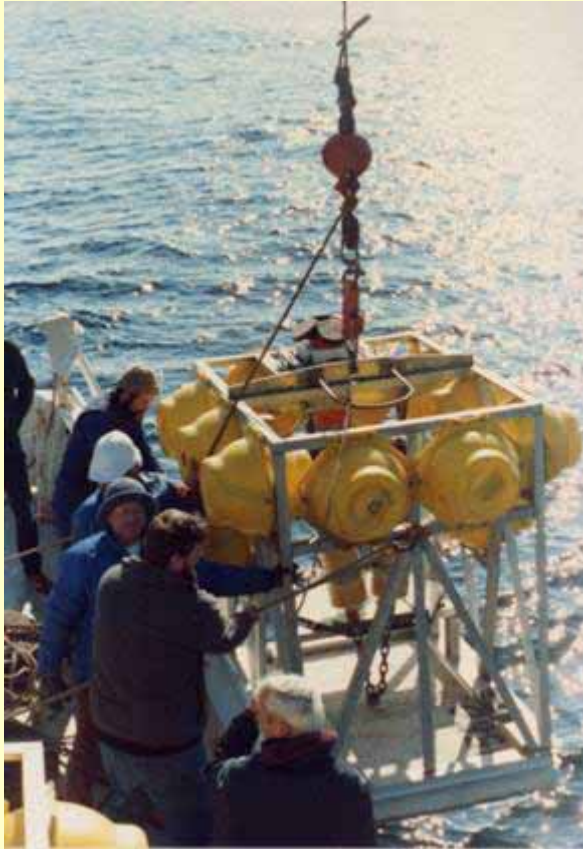


Photo from NSCU

- **Advanced coastal ocean observatories -- platforms for measurements and research**
- **New developments in sensor technologies -- acoustic, optic, and visual**
- **Advanced information technologies**
- **New modeling approaches and algorithm development enabling hindcast, nowcast, and forecast of environmental variables -- including resources**

Securing the resources for a sustained IOOS

Some recent steps towards an IOOS

U.S Global Ocean Observing System Steering Committee, formed 1998 – responsible for design of IOOS.

Ocean.US, formed 2000– a component of interagency program NOPP – responsible for implementation of IOOS.

A number of reports to Congress have identified the need for sustained and integrated coastal observations. They will be used to:

- ***detect and forecast climate variability***
- ***facilitate safe and efficient marine operations***
- ***help to ensure national security***
- ***manage resources for sustainable use***
- ***preserve healthy and restore degraded marine ecosystems***
- ***mitigate natural hazards, improve weather forecasting***
- ***help to ensure public health***
- ***enable sustained marine research***

Move to Develop Regional Associations and National Federation of RAs (Regional Summit of March 2003)

Recommendations to meet the challenges:

- Engender an academic reward structure that supports interdisciplinary scientific collaborations, product development for a variety of users, and outreach and (two-way) education that will optimize the application and enhancement of the IOOS;
- Support cutting-edge research that will provide the basic knowledge and technologies required to develop understanding of complex physical and biological systems – enhance applications research, but not at the expense of basic research – both are needed;
- Secure the necessary investment – and develop a clear and balanced plan to assess priorities, evaluate progress, and allocate funding.