Making IOOS Relevant to Coastal Managers

March 2006

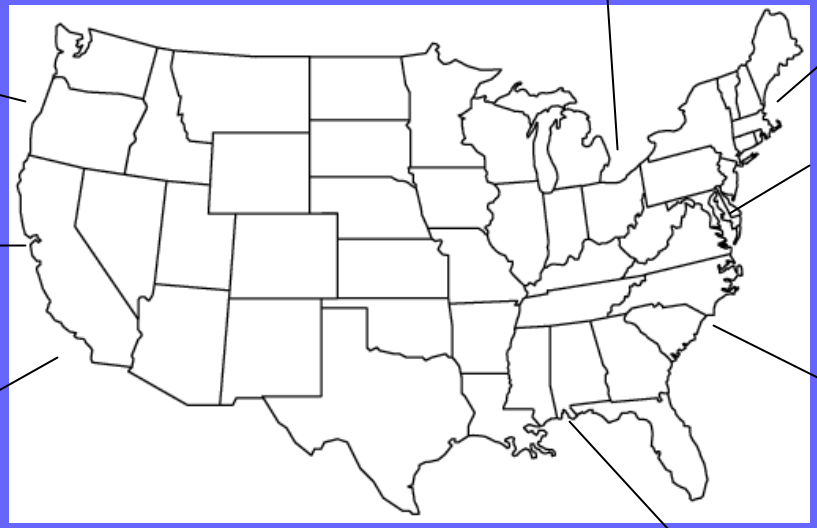
11 Regional Associations
All now have planning funds

AOOS
Alaska Ocean Observing System

GLOS
Great Lakes Observing System

GoMOOS

NANOOS



MACOORA
Mid-Atlantic Coastal Ocean Observing Regional Association

CeNCOOS

SECOORA
Observing our Oceans

Southern California Coastal Ocean Observing System

PacIOOS

GCOOS

CaraIOOS

National Federation of Regional Associations (NFRA)

- Founded in February, 2005
- A non-profit association dedicated to:
  - Representing the needs of the 11 Regional Association to IOOS partners and others
  - Developing “one voice” for the regional perspective
  - Education through communication of lessons learned, success stories

Excerpts from Section 303 CZMA Purposes relating to Ocean Observing

- protection of natural resources
- minimize the loss of life and property caused by improper development in flood-prone, storm surge, geological hazard, and erosion-prone areas
- quality of coastal waters
- siting major facilities
- special area management plans
- collection, analysis, synthesis, and dissemination of coastal management information
- consider such issues as ocean uses potentially affecting the coastal zone.

No Single Type of Manager

- Water quality managers: discharge permit decisions, monitoring, nps pollution, mitigation, TMDLs
- Habitat managers: habitat protection, regulation and restoration
- Fisheries managers: stock assessment, management plans, regulations, ecosystem management;
- Marine geology: mapping and permitting;
- Coastal/marine planning: land use management, aquaculture, dredging, facility permitting (LNG, wind farms, etc)
- Emergency response: oil spill preventions and management; search and rescue; hazards

Needs Assessments

- CSO Sponsored Workshops:
  - Southeast Focus Group Study (Dec 04)
  - Great Lake Focus Group Study (April 05)
- RAs
  - GoMOOS
  - SeaCOORA
  - GOOS
  - SCOOS (Beach monitoring)
  - CeNCOOS
  - NANOOS
  - AOOS

Examples Needs: Storm Surge

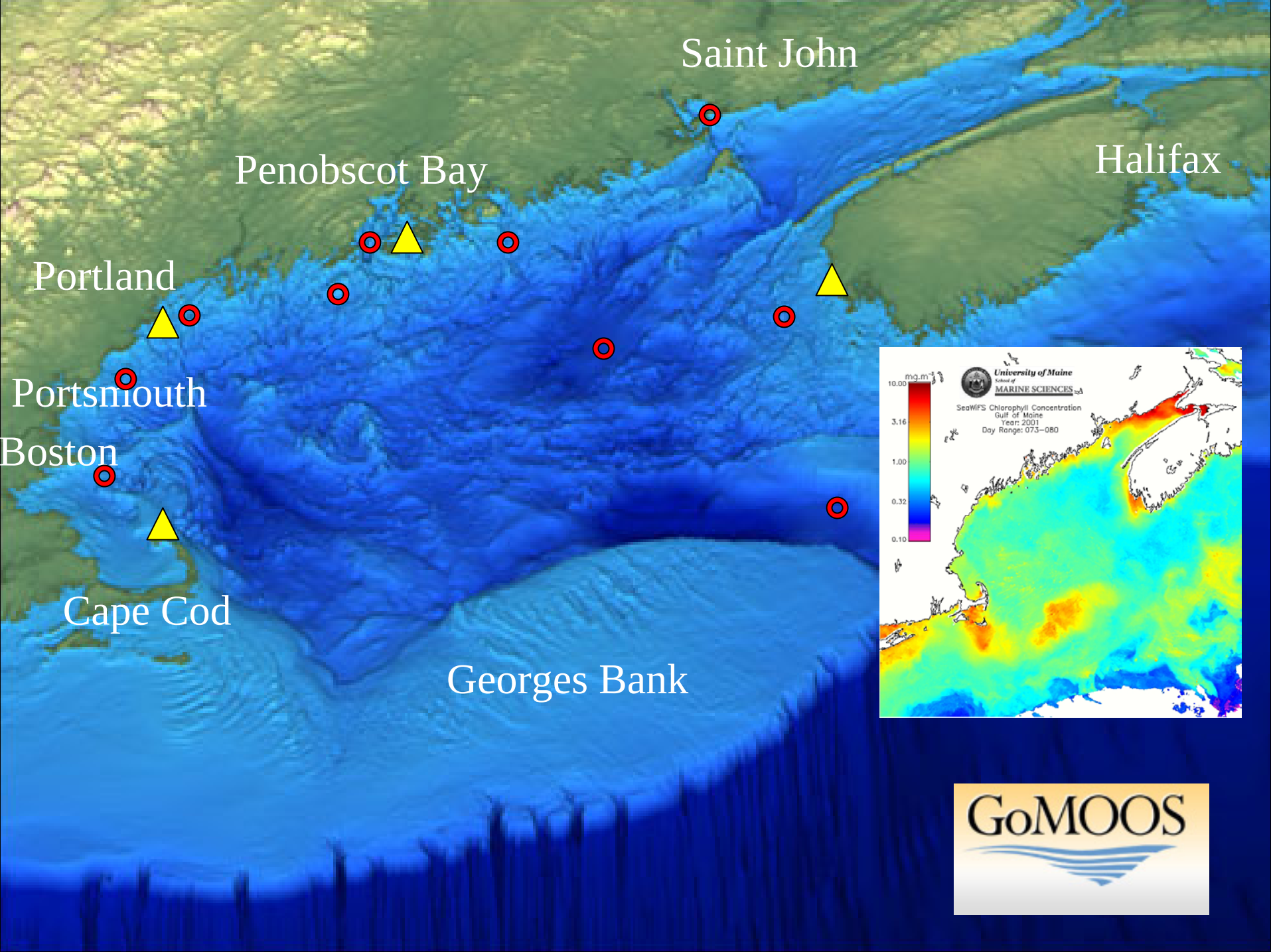
- Shoreline Change and Hazards
- Historical shoreline maps
- Aerial photography
- Sediment load maps (for transport)
- Region predictions of sea level
- Landscape response to sea level change/salinity changes
- Web-based tool for sea level
- Predictive models
- GIS information products

Needs
Examples: Water Quality

- Predictive models for beach and shellfish closures
- Sources of pollution
- Circulation models to assist with dredging
- Affordable technologies for collecting water quality
- Near-shore data stations
- Water chemistry (nutrients)
- Monitoring throughout the water column
- Real-time data
- Trend data

GoMOOS: Gulf of Maine Ocean Observing System

- Founded in 1999 as region-wide system, based in Portland
- Open, non-profit corp. governed by system users and suppliers
- Now 35 members
- From the 5 U.S. and Canadian jurisdictions bordering the Gulf of Maine


Saint John
Halifax
Penobscot Bay
Portland
Portsmouth
Boston
Cape Cod
Georges Bank
University of Maine
School of
MARINE SCIENCES
SeaWiFS Chlorophyll Concentration
Gulf of Maine
Year: 2001
Day Range: 073–080
mg.m-3
10.00
3.16
1.00
0.32
0.10
GoMOOS

GoMOOS: user profile

- More than 1 million page views/year
- Both
  - “end users” (fishermen, harbor pilots, boaters, managers, etc.), and
  - “super” users (modelers, research scientists, meteorologists, value-added companies, Coast Guard, etc.)

Oil Spill Contingency Planning, Prevention, and Recovery

Julie N –
180,000-gal. spill,
Portland Harbor
September 1996

Real-time wind, waves, currents; Circulation models

Search and Rescue

Coast Guard:

6000 SAR missions
500 saved lives
28 lives lost/year

4% success rate
after 2 hours

1% inc. in SAR effectiveness =
6 more saved lives/year

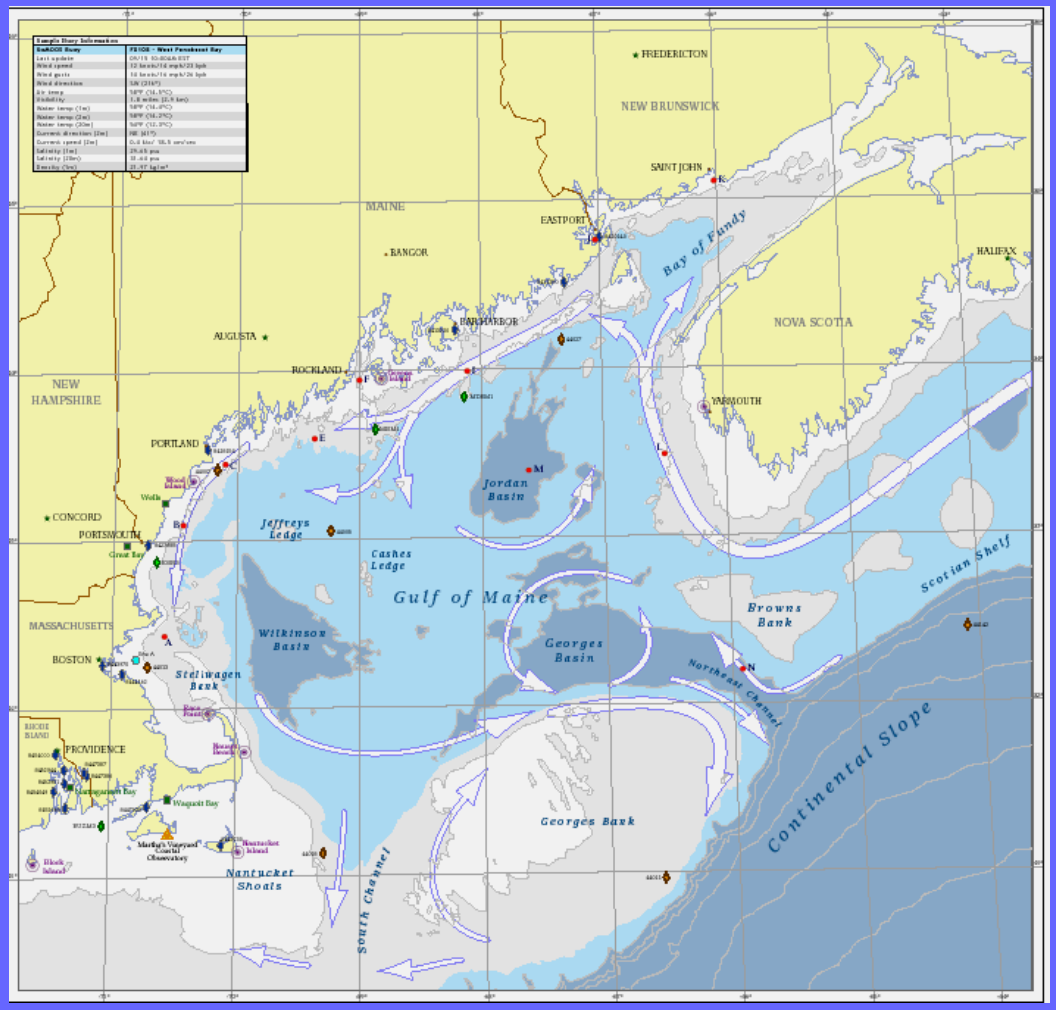
Wastewater Management

New Boston Harbor Outfall

- Boundary conditions for nutrients
- Dissolved oxygen

Helps meet costly monitoring requirements

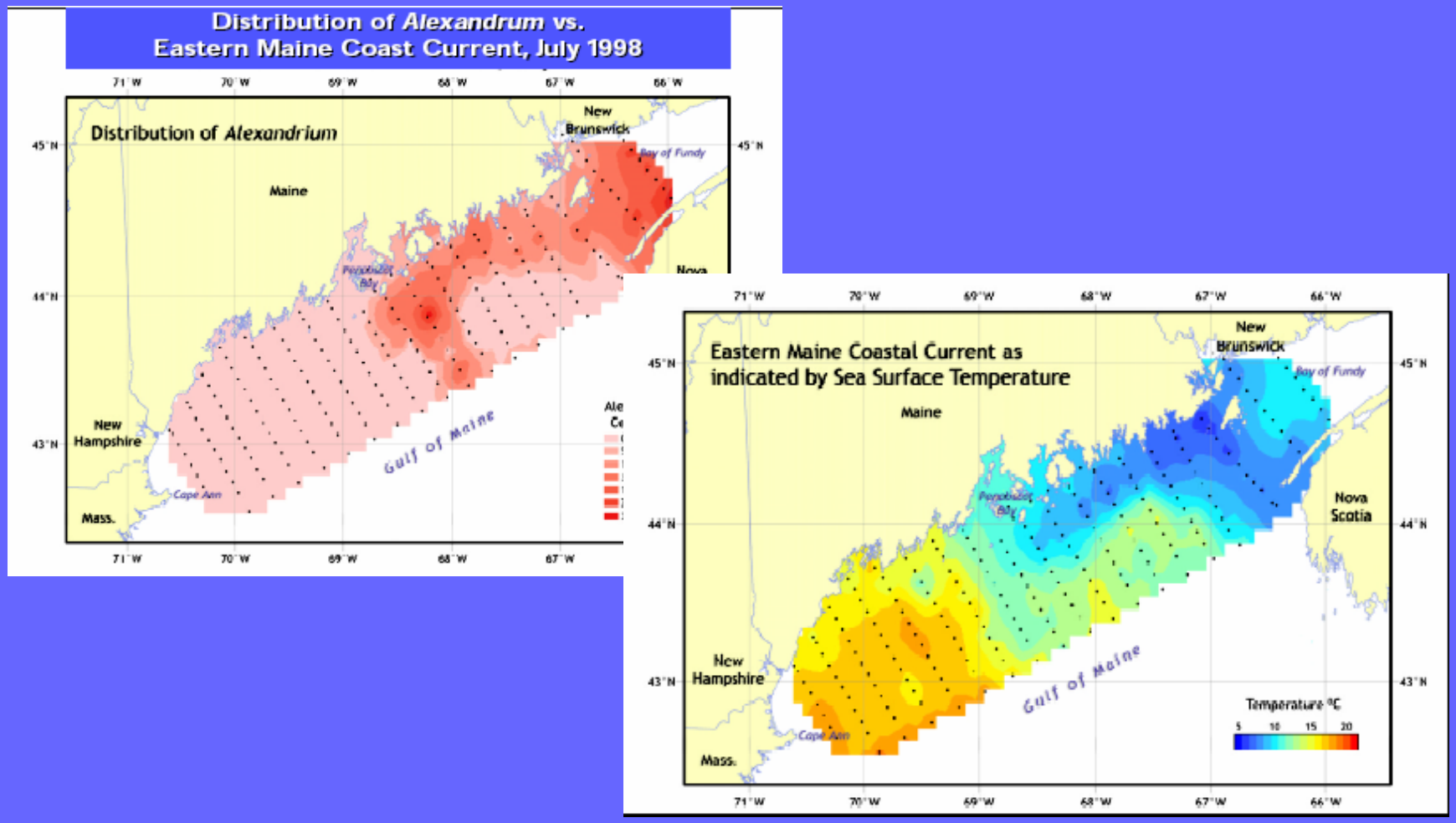
And now a new dimension: INTEROPERABILITY



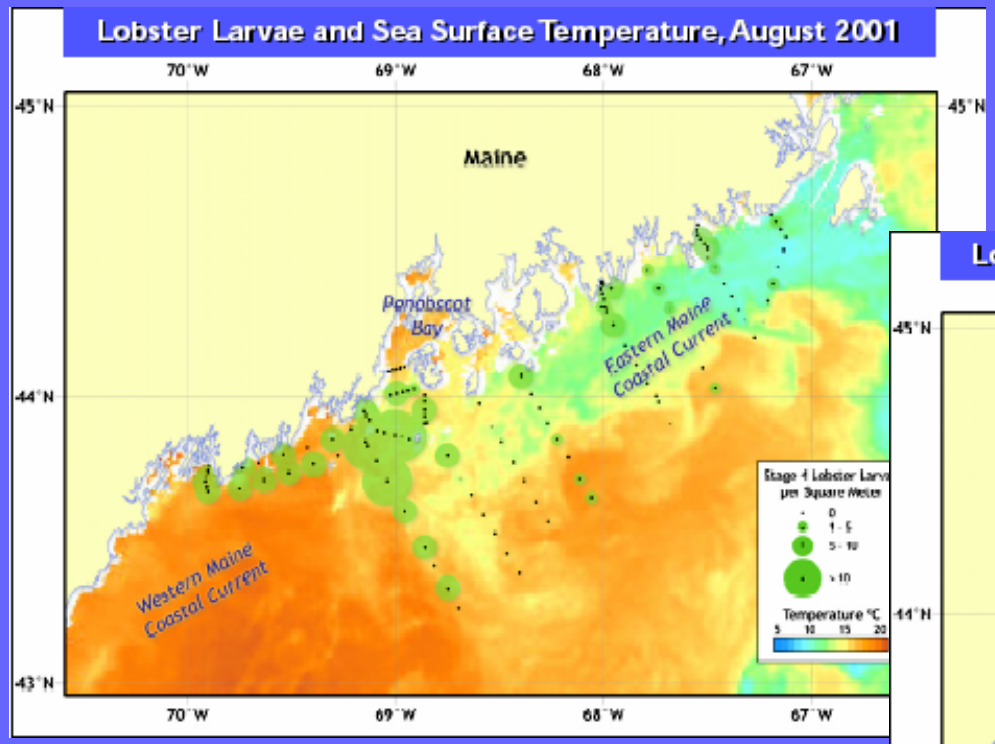
Multiple observing systems (NWS, tide and stream gauges, fisheries surveys, Martha's Vineyard, etc.)

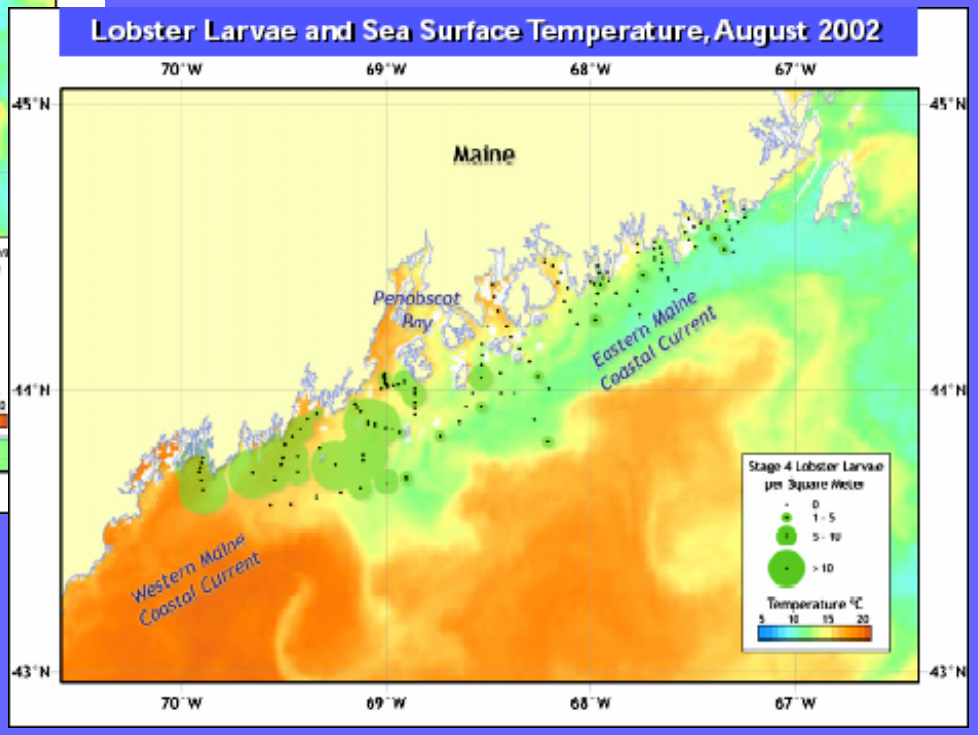
GoMOOS's goal:
to serve as **a catalyst for environmental prediction** by providing the IT "glue" in this distributed system

….distribution of red tide….



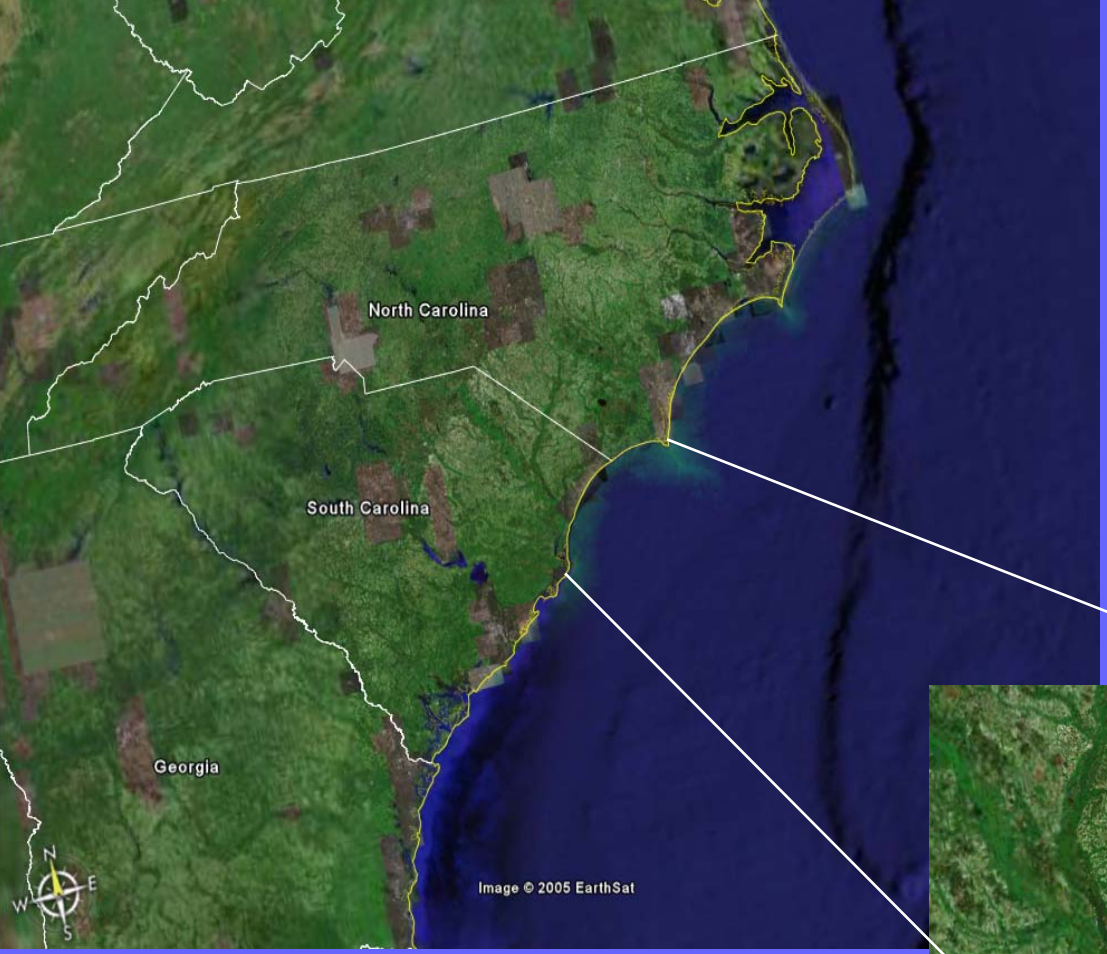
….recruitment of lobster larvae



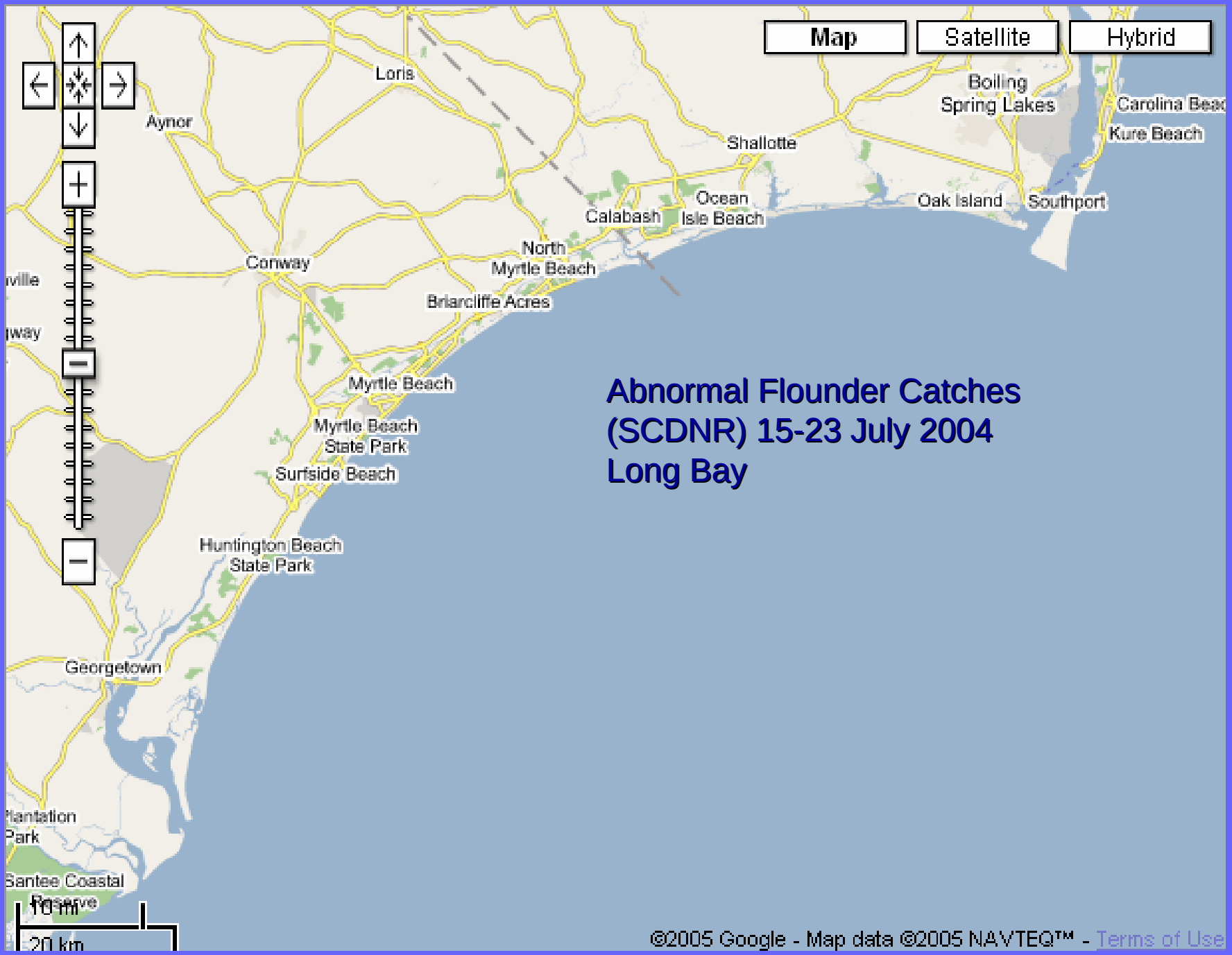


…. assisting state water quality managers ….

Case Study Long Bay Hypoxia Study



A collaborative study among SC management agencies & research institutions



Abnormal Flounder Catches
(SCDNR) 15-23 July 2004
Long Bay

SCDHEC Workshop, September 2004

- Bringing together managers & researchers…
  - SCDHEC, SCDNR, SC Sea Grant, others…
  - USC, CCU, among others…

- Outcomes:
  - Need improved understanding of “normal” conditions, potential factors, impacts
  - Need better awareness of/access to data sources
  - Need coordinated response & monitoring efforts

Baruch Institute/USC – SCDHEC/OCRM Partnership

- Installation of a near real-time DO sensor package at Springmaid Pier
- Data will feed into existing Caro-COOPS data management process/website
- Email alerts of unusual conditions will trigger rapid response sampling plan

SECOORA-funded Hypoxia Study

1) **Compile "information inventory" for Long Bay**
   - **Data aggregation and gap analysis**
   - **"Long Bay Ecosystem Management" Website**

2) **Develop "Sampling Response Plan" for any future hypoxia events…**
   - **Points of contact, available equipment, etc.**
   - **Informational flyer developed and distributed.**
   - **USC to serve as central contact and help coordinate interagency sampling response**

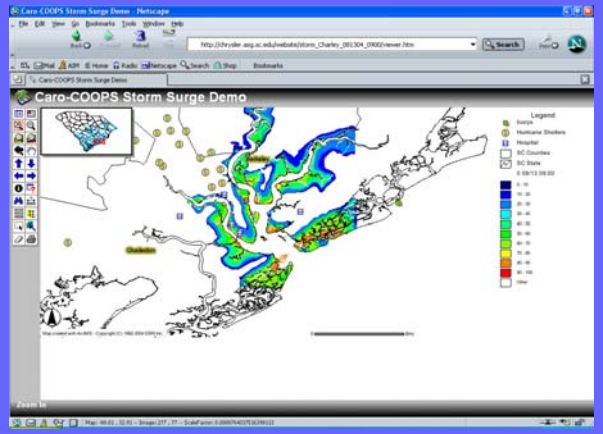
Caro- COOPS: Storm Surge Output Products

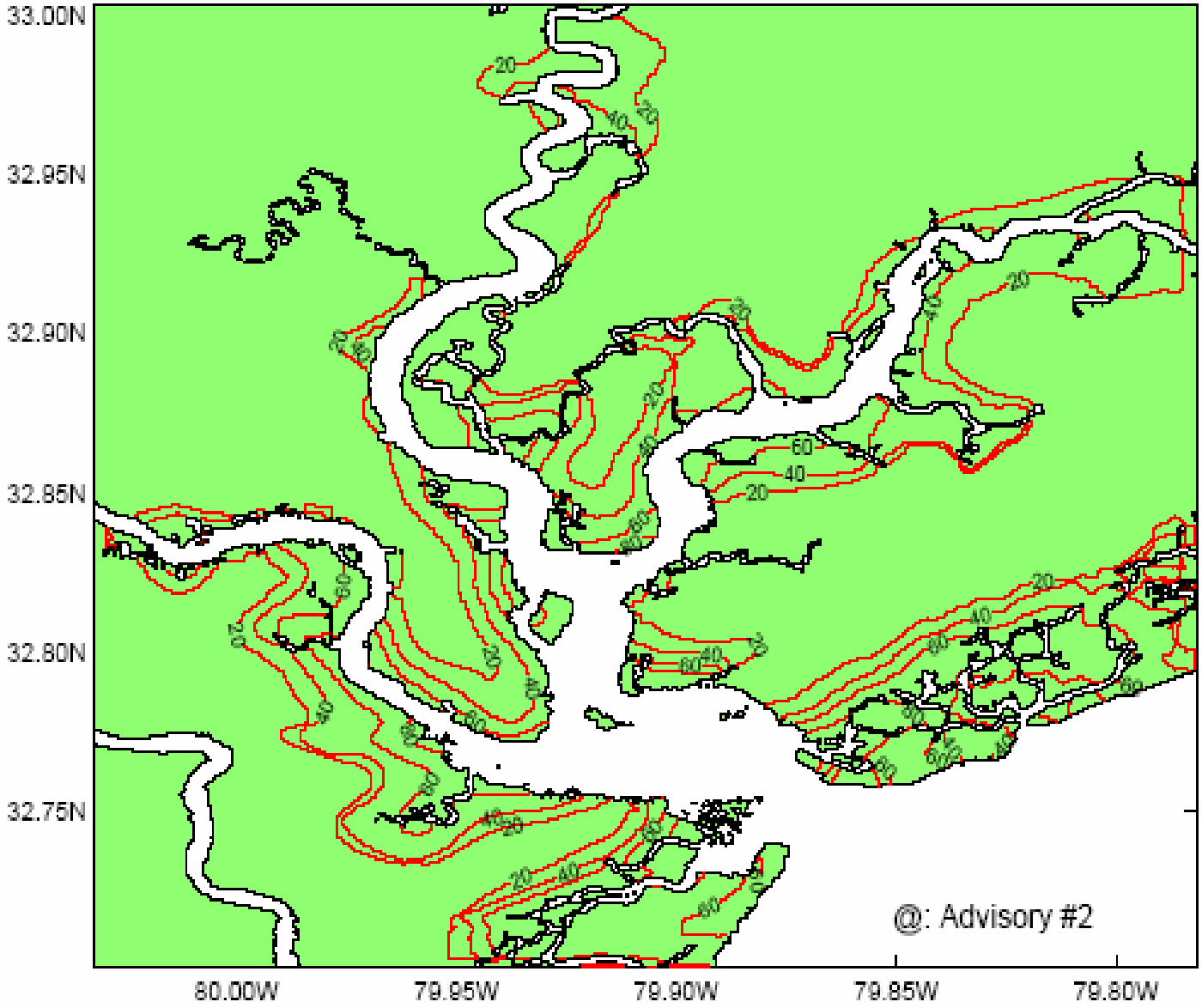
- Computer driven models to predict and describe flooding dynamics of the Carolinas' coastal region during hurricanes, nor'easters, and extra-tropical cyclones. This is a primary focus of Caro-COOPS.

- Ultimate goal is development of real-time computer driven analyses of storm surge and flooding before, during, and after storm landfall.

- Models have been developed for Charleston Harbor, the Hilton Head, Myrtle Beach, and Wilmington areas.

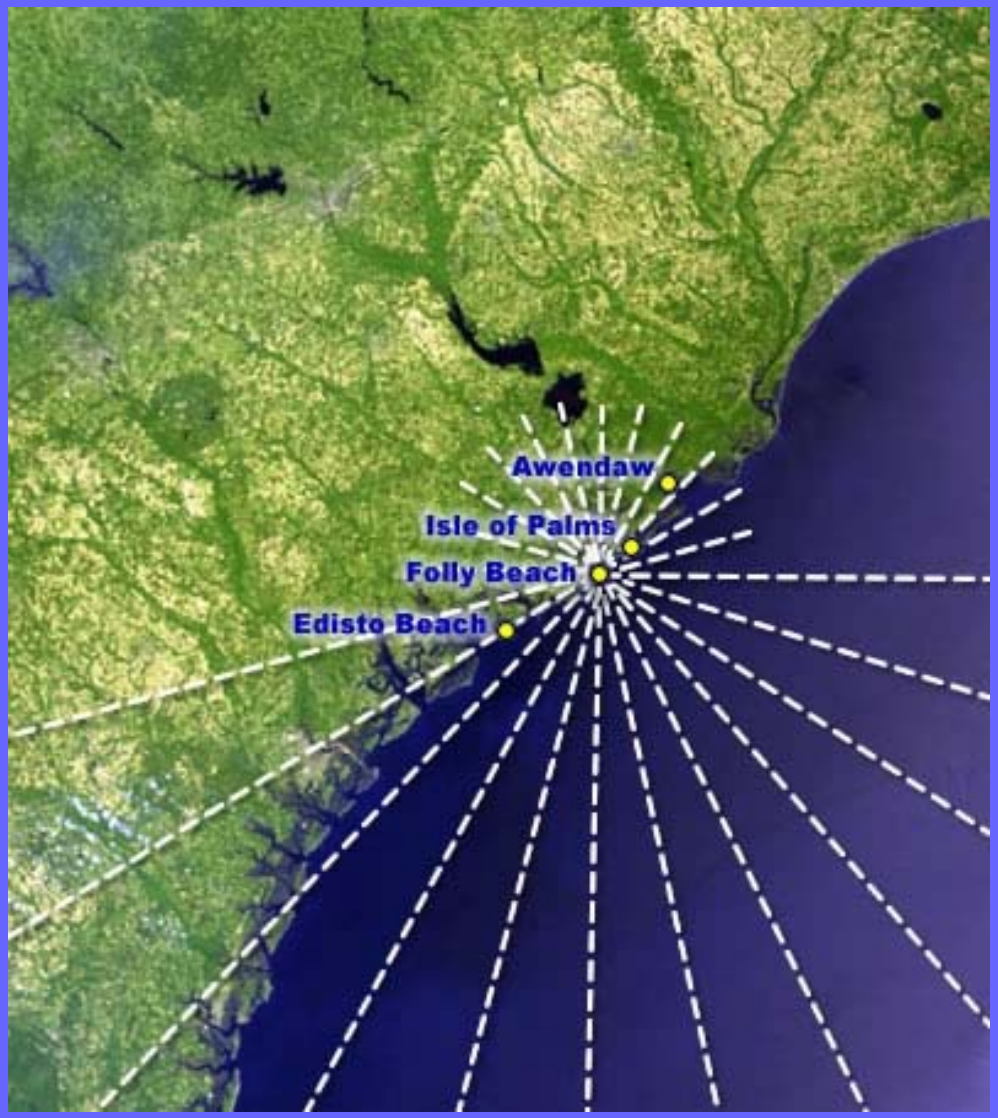
Caro-COOPS has a direct working relationship with the SC Emergency Management Division to develop protocols for using storm surge model output and real time coastal ocean measurements during hurricane events.





Percent probability inundation map provided to SCEMD in five days advance of Hurricane Charley in 2004.

But levels of possible flooding are often needed well in advance of landfall -- led to development of portfolio of scenarios.



Model was run to produce a range of scenarios with 4 landfall locations, 12 landfall angles, 3 predetermined forward velocities, and 4 storm categories.

Caro-COOPS
Carolinas Coastal Ocean Observing and Prediction System

http://carocoops.org/carocoops_website/surge/image_top_89.gif - Microsoft Internet Explorer provided by AT&T WorldNet Service

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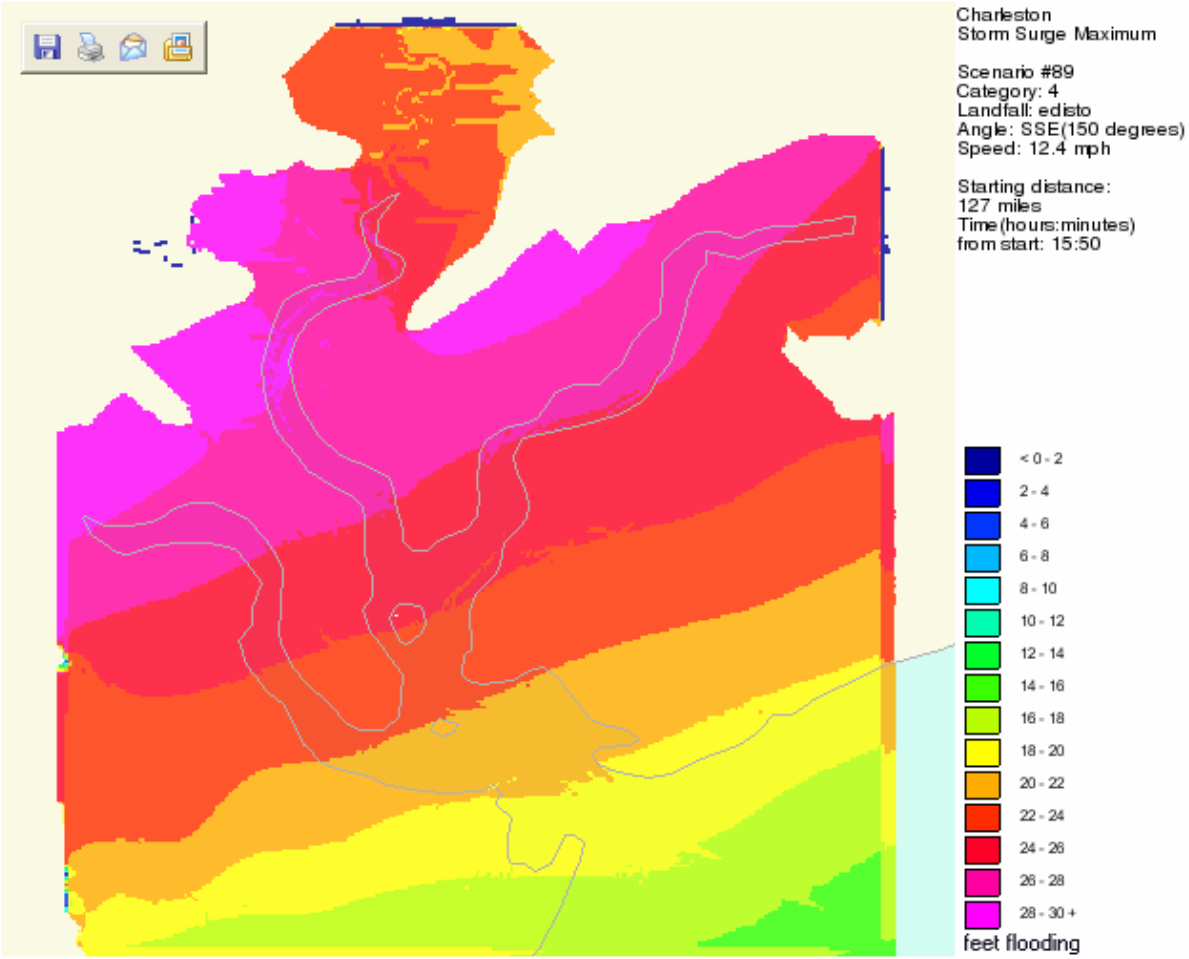
Back Search Favorites

Address http://carocoops.org/carocoops_website/surge/image_top_89.gif Go Links Norton AntiVirus



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Google Earth

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Fly To | Local Search | Directions

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Search

Places

- My Places
- Temporary Places
  - Charleston Track 111 Hour 16
  - Seacoos Southwest

Layers

- Layers
  - Keyhole Community BBS
  - User-Supplied Collections
  - Dining
  - Lodging
  - Banks/ATMs
  - Bars/Clubs
  - Coffee Houses
  - Malls/Shopping Centers
  - Major Retail
  - Movie Rentals
  - Grocery Stores
  - Pharmacy

Image © 2005 EarthSat
Image © 2005 DigitalGlobe

Pointer 32°41'55.49" N 79°51'24.34" W elev 0 ft Streaming |||||||||| 100% Eye alt 45873

Lodging | Dining
Roads | Borders
Terrain | Buildings

Google Earth

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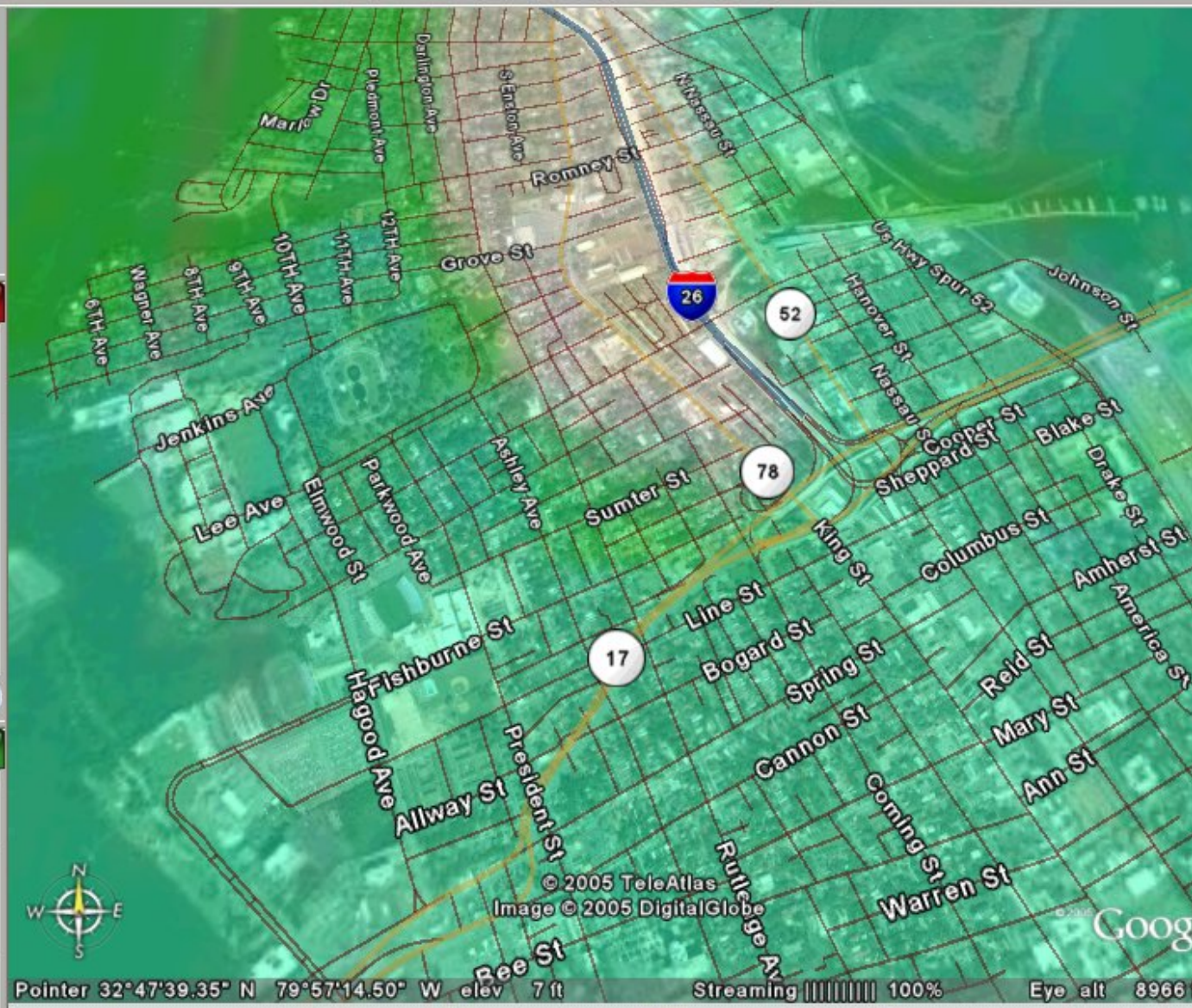
Layers

- Coffee Houses
- Malls/Shopping Centers
- Major Retail
- Movie Rentals
- Grocery Stores
- Pharmacy
- Gas Stations
- Golf
- Stadiums
- Parks/Recreation Areas
- Fire/Hospitals
- Schools



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Lodging | Dining | Roads | Borders | Terrain | Buildings

Next Steps

- Drilling down to understand needs
  - Market approach to defining products
  - Drive system design and regional priorities
- Collaborative demonstration projects
- Continue to engage managers
- Managing expectations