SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

Ecosystem Coordination Update

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Senior Fishery Biologist, SAFMC

Joint Ecosystem-Based Management and Habitat and Environmental Protection Committees Meeting

December 3, 2012

Hilton Wilmington Riverside
301 North Water Street Wilmington, NC 28401
Wilmington, North Carolina

SOUTH ATLANTIC
LANDSCAPE CONSERVATION COOPERATIVE

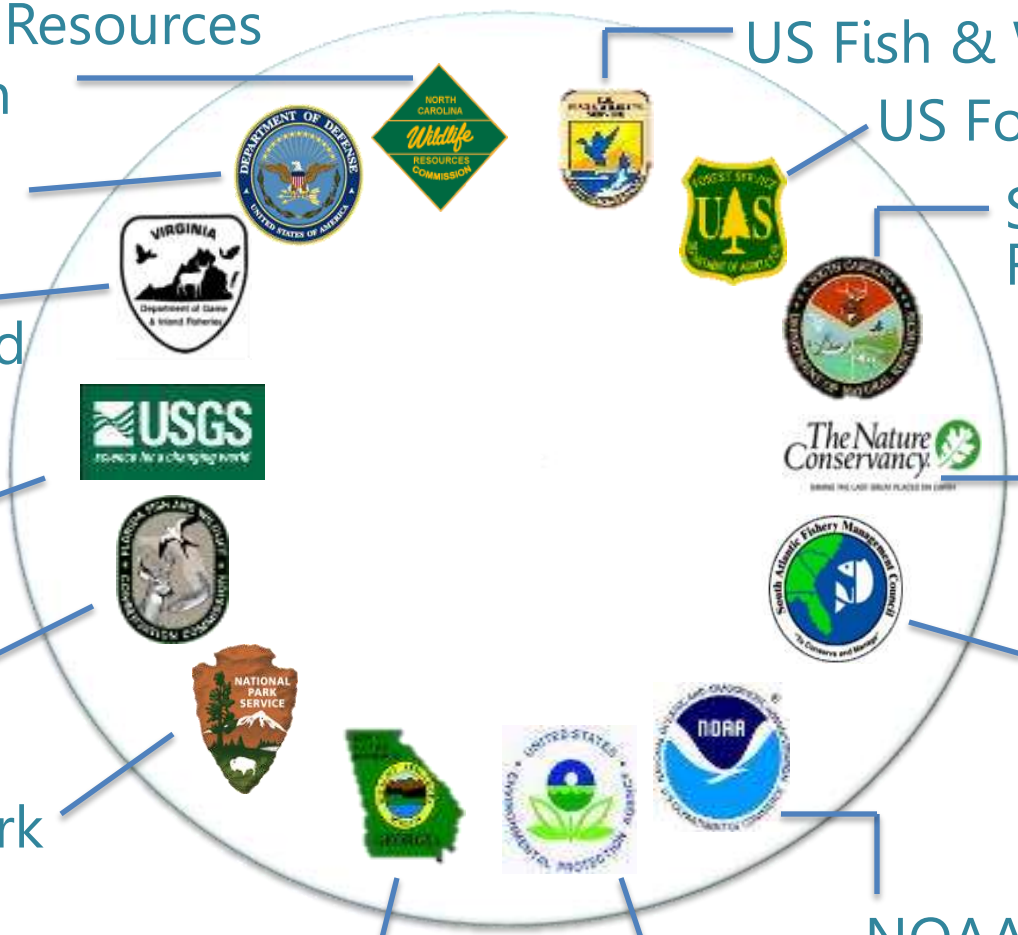
Setting a Course for a Sustainable Landscape

- a forum in which federal, regional and state agencies, non-profits, businesses and communities work together to **develop a shared vision** of landscape sustainability, **cooperate** in its implementation, **and** collaborate in its refinement.

SALCC

- **Mission**: Create a shared Blueprint for Landscape Conservation Actions that sustain natural and cultural resources.
- An interactive, living map that describes the places and actions needed to meet the SALCC's conservation priorities in the face of future change. Conservation Priority= Measurable indicators of success.

Steering Committee



NC Wildlife Resources Commission

DOD

VA Dept. of Game & Inland Fisheries

USGS

FL Fish & Wildlife CC

National Park Service

GA Dept. of Natural Resources

EPA

NOAA

South Atlantic Fishery Management Council

The Nature Conservancy

SC Dept. of Natural Resources

US Forest Service

US Fish & Wildlife Service

SALCC Goals

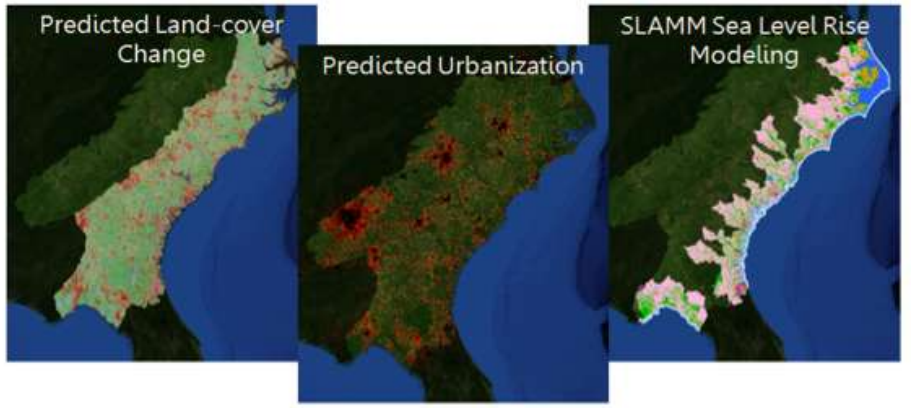
- Provide a shared vision and blueprint for enhancing South Atlantic conservation planning and investments
- Provide support for partners' conservation investment decisions
- Facilitate collaboration between interested South Atlantic partnership organizations to maximize conservation investment
- Promote data integration and sharing of landscape level data sets
- Evaluate and report progress toward creating a South Atlantic blueprint useful to partners

Examples of current work toward SALCC goals

Provide a shared vision and blueprint – Goal 1

Purpose: Build on existing planning efforts (SWAPs, OCS, etc.) to define measurable indicators of conservation success for the SALCC

Provide support – Goal 2



Deliver interim products to key partners

Partners Working Together to:

- Create a South Atlantic conservation blueprint
- Provide decision support to help partners align conservation investments with the blueprint
- Leverage public-private partnerships to maximize benefits of ongoing conservation investments
- Promote data integration to leverage existing information and fill gaps
- Deliver measurable results

Our eyes on the Southeast's ocean and coastal waters

SECOORA
Southeast Coastal Ocean Observing Regional Association

- SECOORA is the regional solution to integrating coastal and ocean observing data in the Southeast United States to inform decision makers and the general public. The SECOORA region encompasses 4 states, over 42 million people and spans the coastal ocean from North Carolina to the west Coast of Florida. We are creating customized products to address these thematic areas: Marine Operations; Coastal Hazards; Ecosystems, Water Quality, and Living Marine Resources; and Climate Change

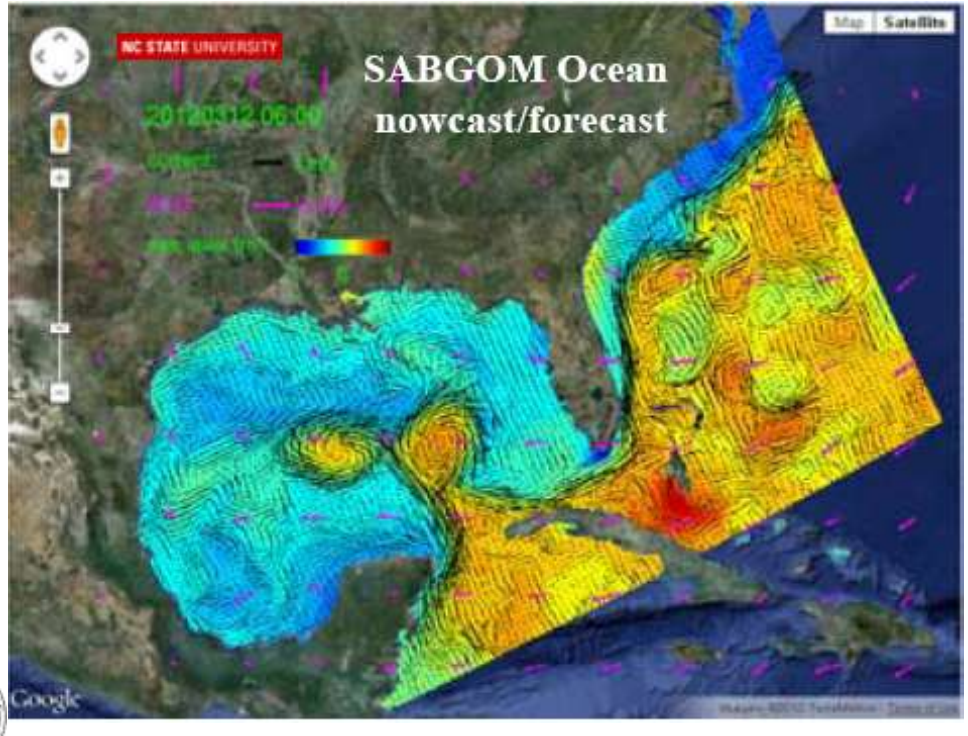
West Florida Shelf Modeling

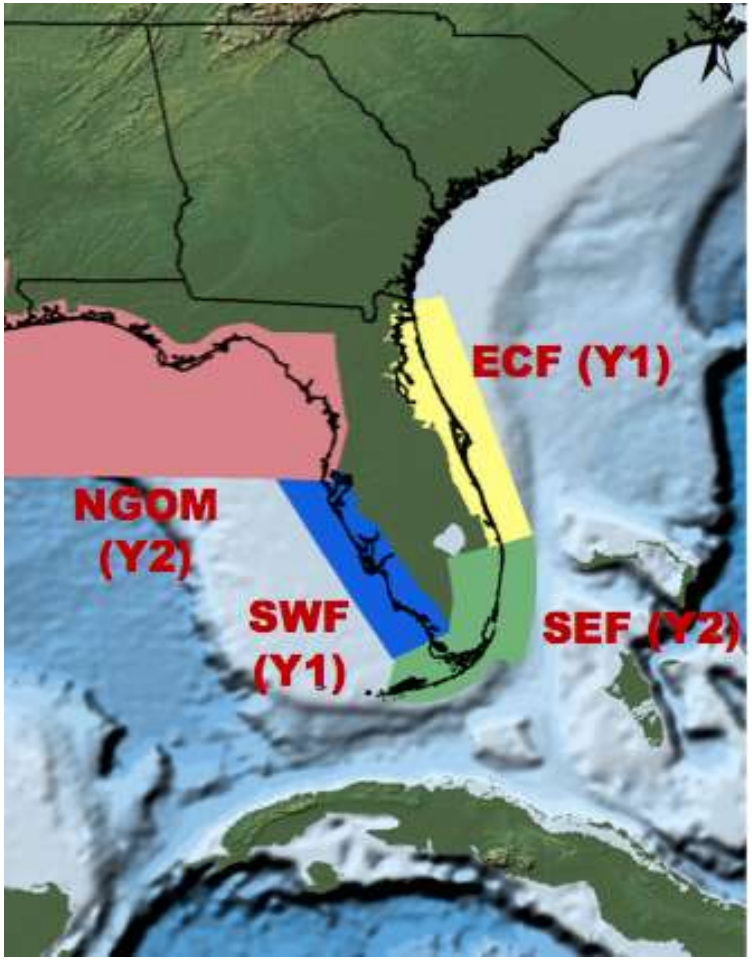
Surge Modeling

- Dr. Peter Sheng, UF

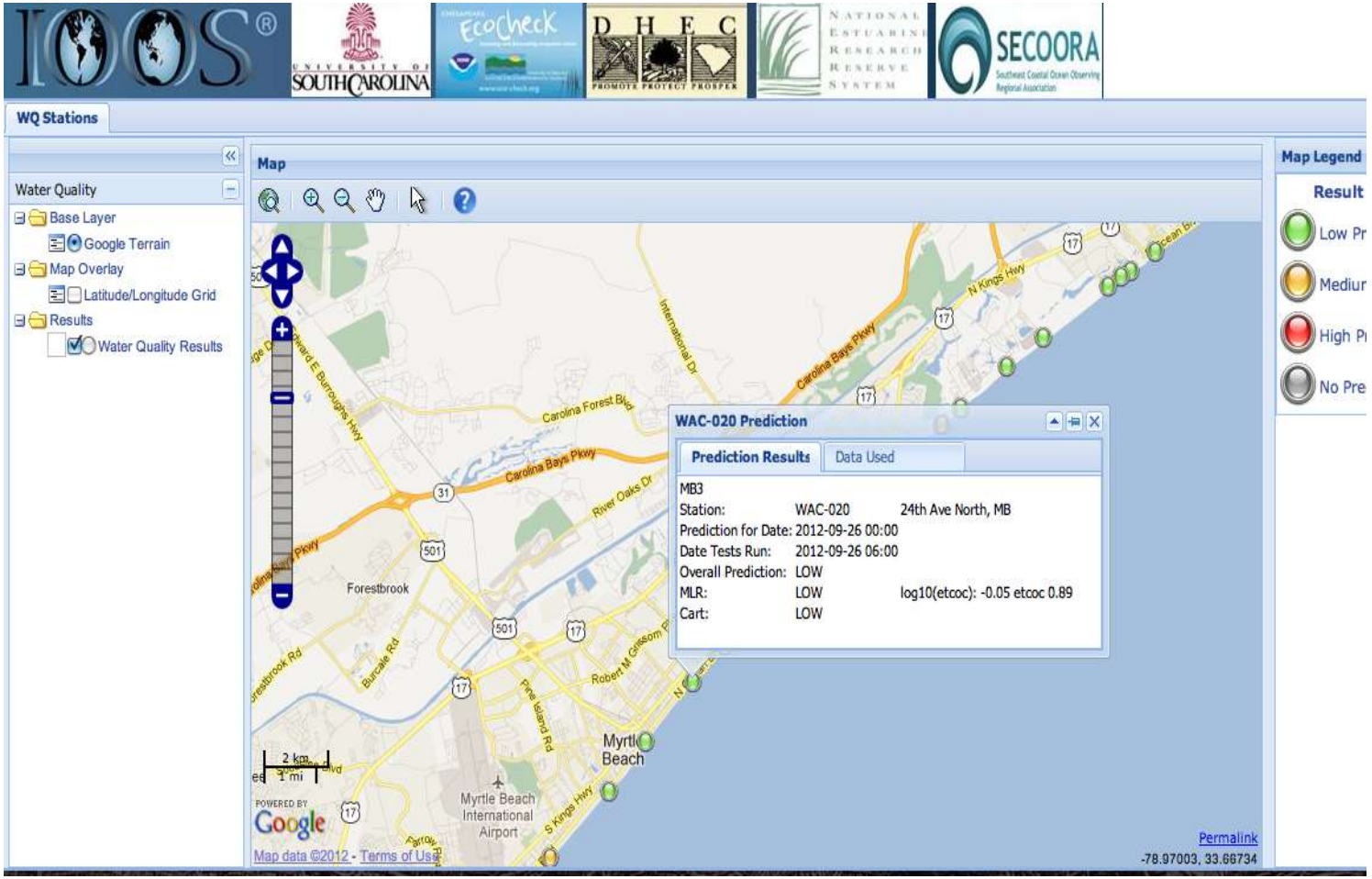
Regional SABCOM

- Dr. Ruoying He, NCSU





Beach Water Quality App



GSAA RIMS Project

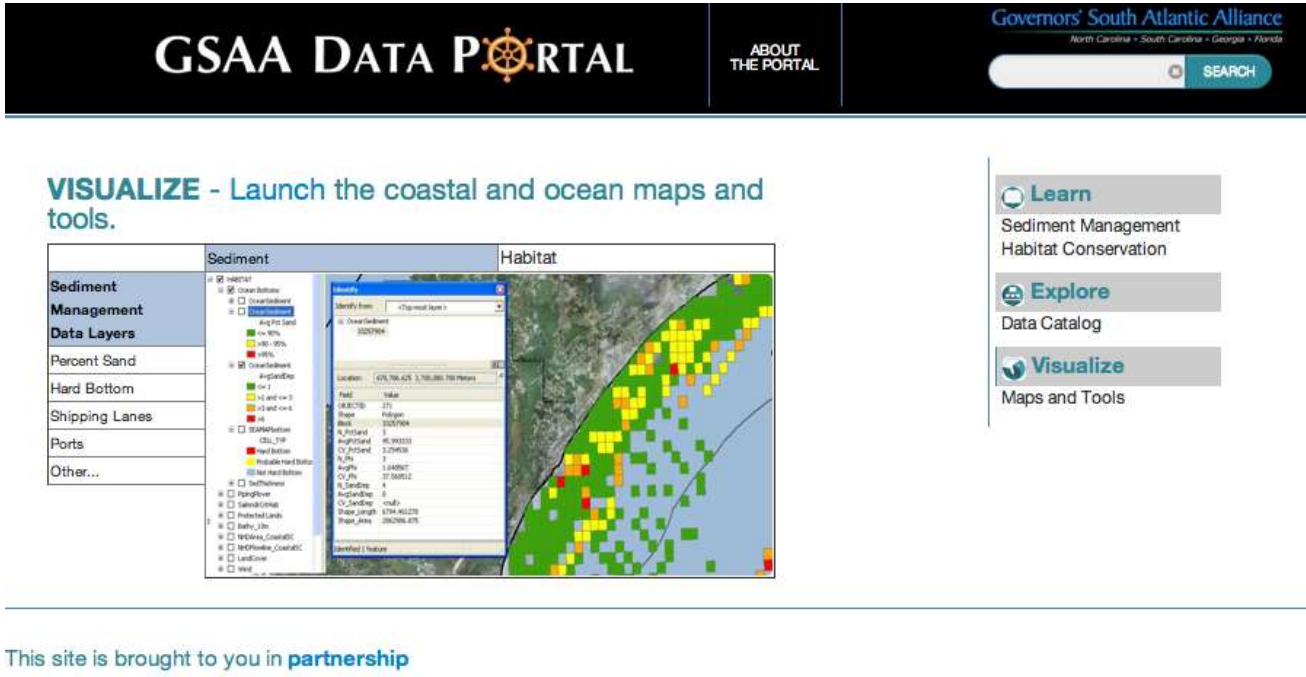
Year 1 Goal: Build a Regional Information Management System (RIMS) to support coastal & ocean planning & other information management needs

Obj. 1: Assessment of user needs

Obj. 2: Design the RIMS, identify data sets, and assess interoperability

Obj. 3: Develop a prototype RIMS

Obj. 4: Recommend Decision Support Tools

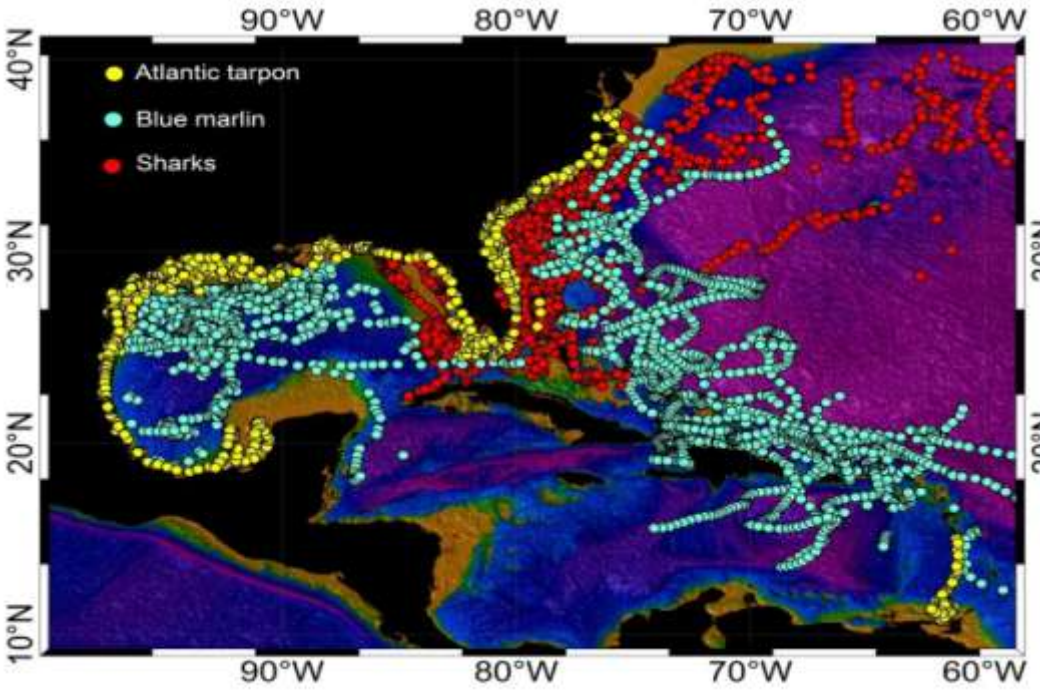


SECOORA Overview -Subcomponents

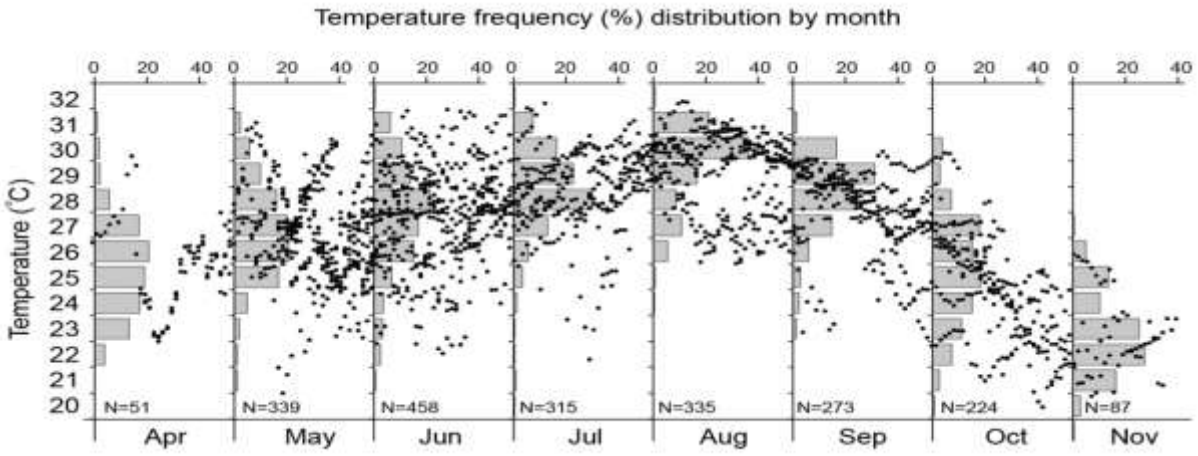
1. Monitoring and Observing (48%)
   - Moored (buoys) and Coastal Stations *(in situ)*
   - High Frequency Radar (HFR)
2. Modeling (15%)
   - Circulation
   - Fisheries management
   - Inundation, surge
   - Rip current prediction (planned)
   - Sea-level (planned)
   - Water Quality
3. Data Management and Communications (12%)
4. Product Development (5%)
5. Education and Outreach (10%)
6. Governance (regional coordination) (10%)

SECOORA Partner Research - Linking Fish Movement and Oceanography

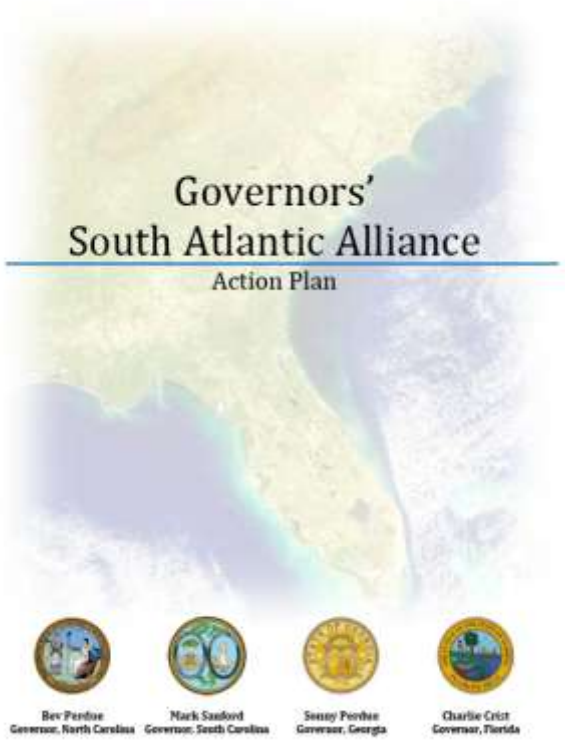
Tracks of tarpon, blue marlin, tiger sharks from 2001-2010 using PAT (Courtesy of J. Ault). Notice the fish tracks tend to be in coastal regimes and in the LC, FC and GS regimes-Improve OHC estimates?



Histograms and scatter show these species seek warm water especially T(z) of 26C or more. Adding S(z) on the CTD tags SMRU.



Governors' South Atlantic Alliance Status and Update



Governors' South Atlantic Alliance
Implementation Plan 2011

Implementation Plan Executive Summary

...rnors' South Atlantic Implementation Plan is a regional response to address key environmental, ...al defense, and cultural issue areas facing the Southeastern U.S. coasts and ocean. The Governors ...nated four priority issue areas that are of mutual importance to the sustainability of the Southeast U.S. ...: healthy ecosystems, working waterfronts, clean coastal and ocean waters, and disaster-resilient ...e Issue Area Technical Teams, guided by lead state mentors and the Executive Planning Team, with ...olders and other partners, will continue to develop this Implementation Plan to address objectives ...Alliance's Action Plan.

OSYSTEMS. Healthy ecosystems are the backbone of the Southeast's thriving coastal communities. ...enges of conserving the biological, economic and cultural diversity of the region, four objectives were ...ally-coordinated, compatible and sustainable ecosystem planning and management; assessment of ...present and climate change impacts on the structure and function of coastal habitats; development and ...cience-based land use, coastal, and ocean planning and management; and determination of long-term ...mediation strategies for invasive species.

...ntation steps for the first objective include analyses of existing habitat and marine resource mapping ...tion of gaps in those efforts, and development of a coordinated framework through which to map priority ...ata from existing monitoring programs will be collated and compared to identify resource measures of ... This information will be used to enhance, inform and coordinate ongoing coastal ecosystem ...atives.

...econd objective, implementation includes development of a list of anticipated climate change impacts on ...nd biological resources as well as vulnerability assessment maps that integrate those impacts for use in ...ing efforts. Other actions include evaluation of existing "indices of condition" (e.g., for habitats, ...n, community structure, etc.) to determine suitability for use at a regional scale. These efforts will ...opment of a methodology to forecast regional ecosystem "carrying capacity" that integrates climate ...dative impact assessments from coastal development.

...ntation actions to accomplish the third objective include identification and prioritization of resources in ...conservation that would benefit from regional coastal and marine spatial planning. The Alliance will ...se ecosystem-based land-use planning strategies that incorporate established methods and policies. ...nce will evaluate existing public education and outreach efforts regarding ecosystem health and develop ...rograms where necessary to target specific user groups or incorporate additional information for current ...

...rd to the fourth objective that addresses invasive species, implementation steps include evaluation and ...r necessary) of invasive species map products and compilation of state invasive species remediation plans ...hanisms to prevent future introductions. The identification and engagement of regional species experts ...formation and understanding of gaps in knowledge, surveillance, and alert systems must also be ...

...TERFRONTS. Growth, environmental degradation, and displacement are some of the issues facing ...ng waterfront communities along the southeastern U.S coastline. Robust working waterfronts that ...-dependent facilities and related shore-side infrastructure that offer access or support facilities for ...erce, research, and other public uses, including military operations and training, are essential to ...community well-being. Further, major port complexes in the Southeastern U.S. are of vital economic importance to the ...

July 6, 2011 South Atlantic Alliance Implementation Plan—a living, working document. Page 1

Action Plan Signed in December 2010

Implementation Plan agreed by Steering Group on June 30, 2011

Business Plan to be finalized in 2012

2nd Annual Governor's SAA Meeting Sept 6-7, Charleston, SC

- 75 participants from the NC, SC, GA, FL, federal agencies, and other partner organizations met to discuss progress over the past year
- Issue Area Technical Teams prioritized specific actions to be taken over next 12 months

2012 Prioritized Actions for the Governor's SAA

- Healthy Ecosystems
  - Map known distributions of key estuarine/marine habitats/land use cover
  - Marine spatial plan for location of key coastal /marine resources & activities for multi-use management decisions

- Working Waterfronts
  - Protect Military Waterfronts: Develop inventory/collect info
  - Develop Common Definitions for commercially, recreationally, culturally important, and historic waterfronts for regional inventory

2012 Prioritized Actions for the Governor's SAA

- Clean Coastal and Ocean Waters
  - Establish regional technical level work group for sharing watershed water quality improvement processes
  - Develop recommendations on processes & protocols to transfer knowledge/implement BMPs for point & non-point source controls

- Disaster-Resilient Communities
  - Evaluate nationwide Post-Disaster Redevelopment Planning initiatives to improve redevelopment options
  - Develop guidance to improve redevelopment considerations in hazard mitigation plans, & local comprehensive & growth management plans

SOUTHEAST AQUATIC RESOURCES PARTNERSHIP

SARP

SARP/NOAA Community-Based Restoration Program Partnership

- In 2007, NOAA's Community-based Restoration Program established a new grassroots partnership with SARP. Together, they have worked to fund, implement and monitor restoration projects in the nine Southeastern coastal states that border the Gulf of Mexico and Atlantic Coast.

NOAA HABITAT CONSERVATION | RESTORATION CENTER
NATIONAL MARINE FISHERIES SERVICE

Project Example: South Carolina Department of Natural Resources (DNR) - *Community-based and larger-scale oyster restoration in ACE Basin NERR Phase II*

- Create and protect intertidal oyster reefs and saltmarsh
- Create essential fish habitat within the Ashepoo-Combahee-Edisto (ACE) Basin National Estuarine Research Reserve in South Carolina

SARP/SALCC Advancing Instream Flow Science in the South Atlantic

SOUTHEAST AQUATIC RESOURCES PARTNERSHIP
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SOUTH ATLANTIC
LANDSCAPE CONSERVATION COOPERATIVE

Instream Flow Resources

- Hydrologic Foundation
- Ecological Databases
- Flow-ecology Literature Review
- Flow Alteration Assessment
- River Classification
- Aquatic Conservation Priorities

SARP Cooperation with the Southeast Watershed Forum

Mission is to assist communities and organizations to better protect their land and water resources through watershed-friendly growth.

Integrate Habitat Protection into Local Land Use Planning

- Review Impact of growth on natural resources
- Increase awareness of fish habitat, NFHAP, and conservation techniques
- Define green infrastructure and why it is important
- Integrate land use, water and habitat protection
- Map a green infrastructure network
- Identify strategies and tools for land conservation

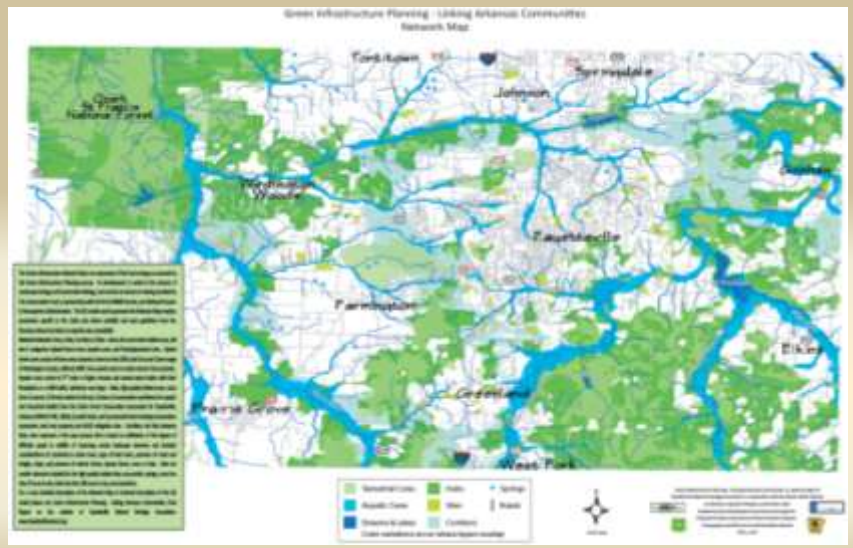
Mapping Exercise:

Identifying a Green Infrastructure Network

- Identify key elements of a green infrastructure network to meet community priorities

- Identify locations to be preserved that will:
  - Protect water quality
  - Preserve priority habitat
  - Maintain hydrologic functions
  - Attain other local priorities

GREEN INFRASTRUCTURE NETWORK



Ecosystem Tools Update
SAFMC Map Services

Essential Fish Habitat (EFH) – displays EFH and EFH-HAPCS for SAFMC managed species and NOAA Fisheries Highly Migratory Species

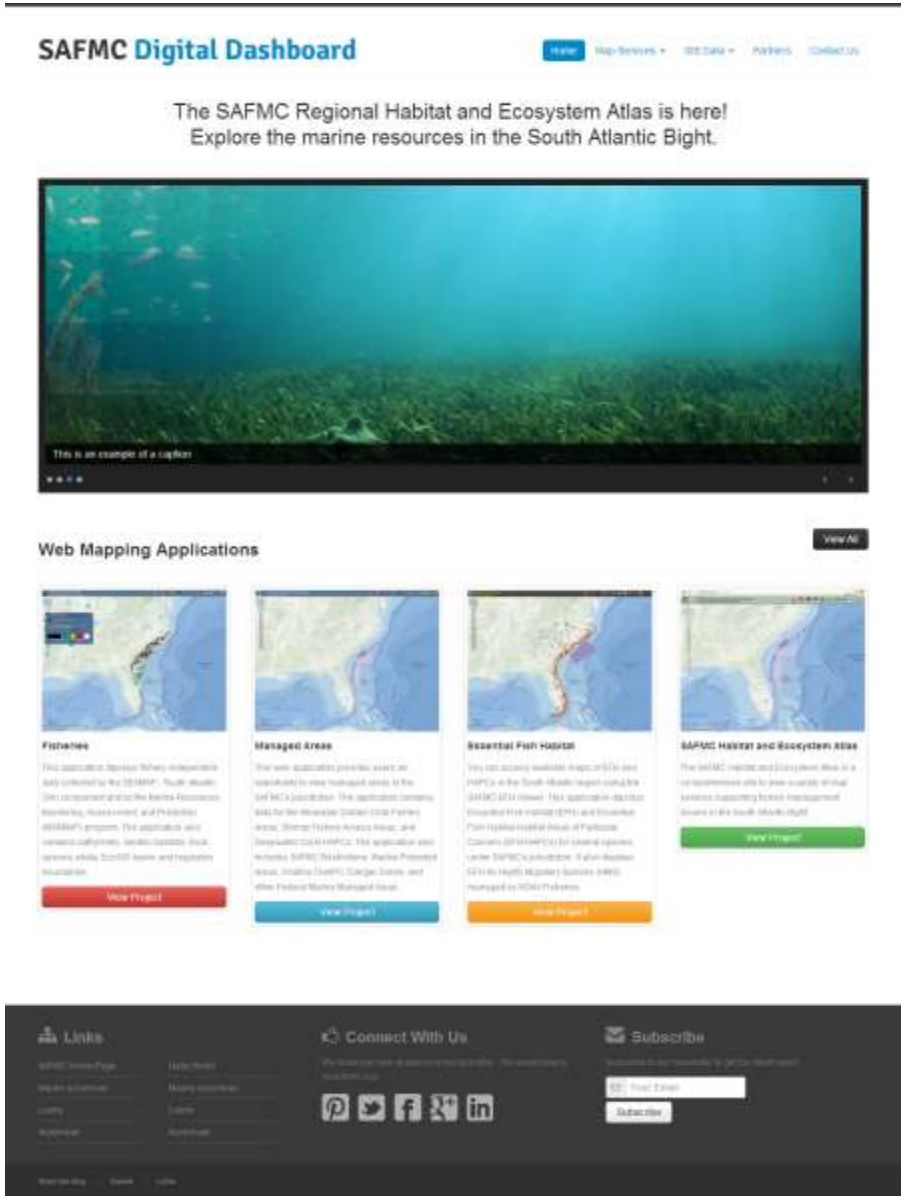
Fisheries - displays Marine Resources Monitoring, Assessment, and Prediction (MARMAP) and Southeast Area Monitoring and Assessment Program South Atlantic (SEAMAP-SA) data .

Managed Areas - displays a variety of regulatory boundaries (SAFMC and Federal) or management boundaries within SAFMC's jurisdiction.

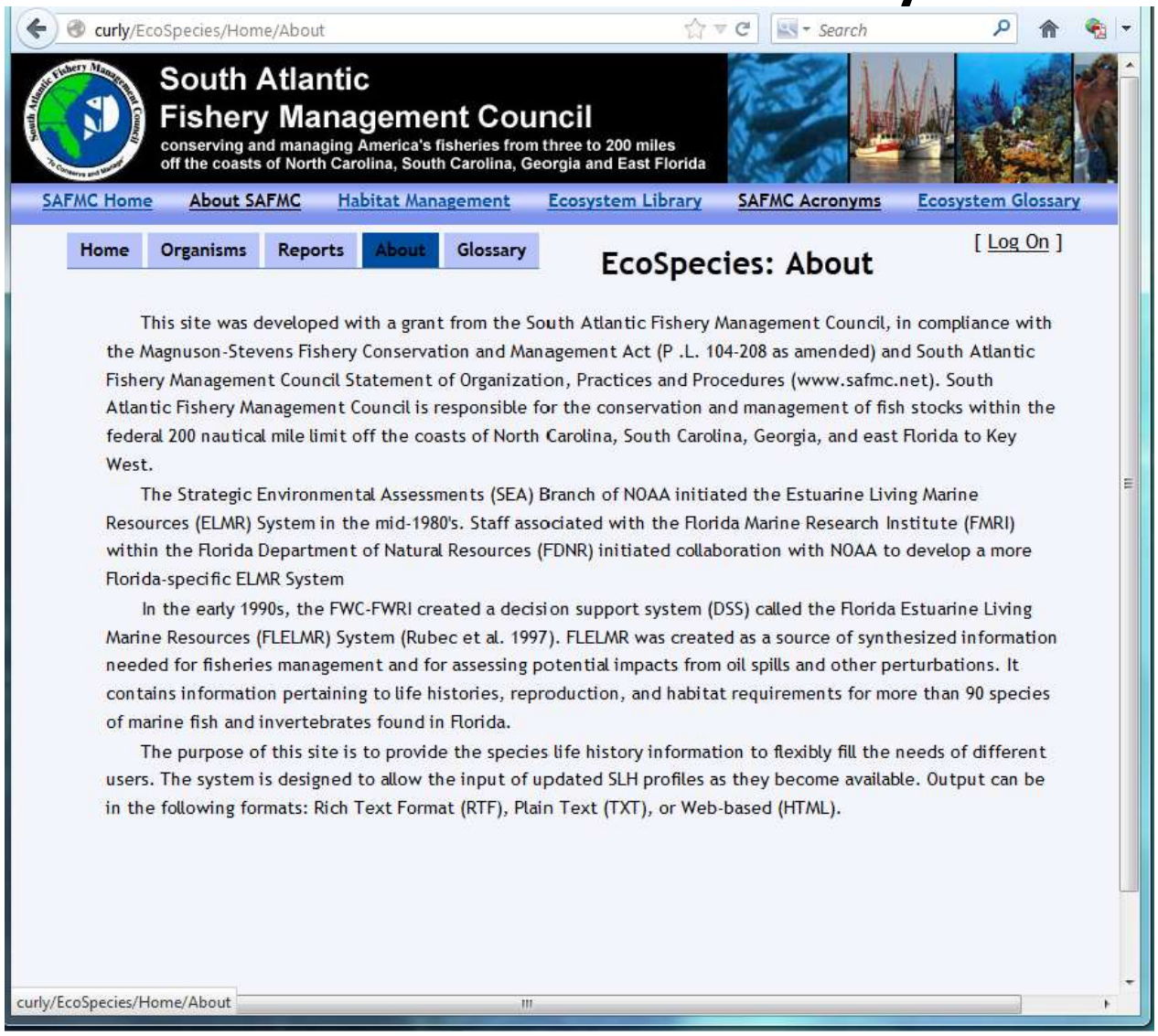
Habitat – displays habitat data collected by SEADESC, Harbor Branch Oceanographic Institute (HBOI) and Ocean Exploration dives, as well as the SEAMAP shallow and ESDIM deepwater bottom mapping projects, multibeam imagery, and scientific cruise data.

Multibeam Bathymetry - displays a variety of multibeam data sources and scanned bathymetry charts

Nautical Charts – displays coastal, general, and overview nautical charts for the SAFMC's jurisdictional area


SAFMC Digital Dashboard
The SAFMC Regional Habitat and Ecosystem Atlas is here!
Explore the marine resources in the South Atlantic Bight.
Web Mapping Applications
View All
Fisheries
Managed Areas
Essential Fish Habitat
SAFMC Habitat and Ecosystem Atlas
Links
Connect With Us
Subscribe

EcoSpecies : Online Life History and Habitat Information System



The Following Slides Provide Additional Information on The Regional Activities of SALCC, SECOORA, GSAA and SARP

SOUTH ATLANTIC
LANDSCAPE CONSERVATION COOPERATIVE

SECOORA
Southeast Coastal Ocean Observing Regional Association

Governors' South Atlantic Alliance
North Carolina • South Carolina • Georgia • Florida

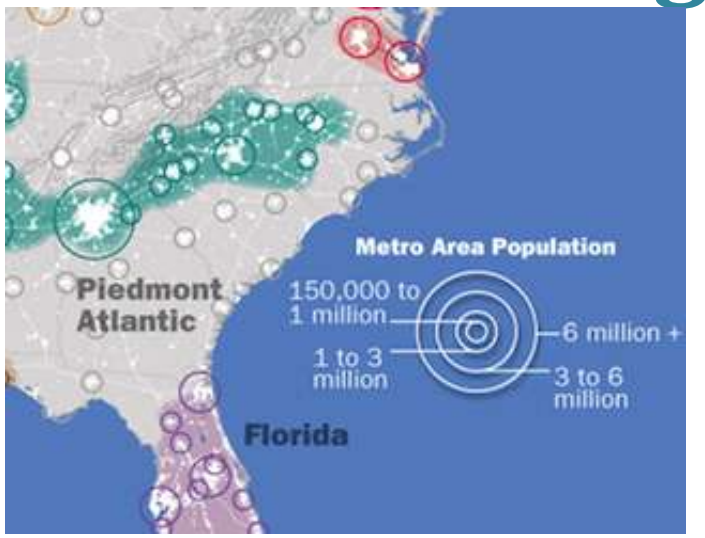
SOUTHEAST AQUATIC RESOURCES PARTNERSHIP
SARP

SOUTH ATLANTIC

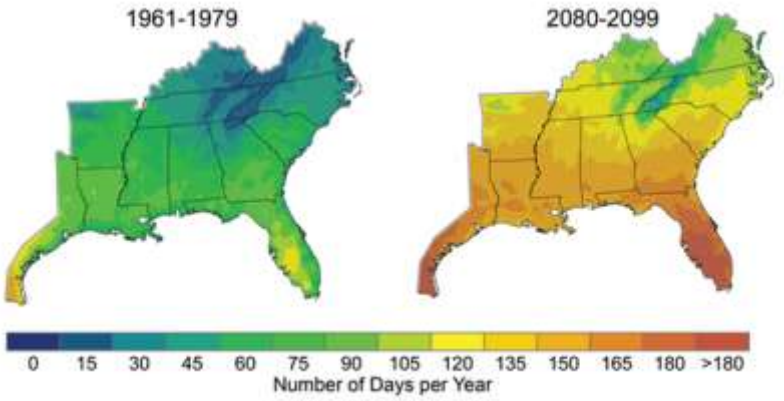
LANDSCAPE CONSERVATION COOPERATIVE

Landscape Conservation Cooperatives

Why does what SALCC is doing matters?



Days per year with peak temperature over 90° F



Over 89 million acres (terrestrial, freshwater, marine)
92% private land
120% increase in urban area by 2050

Examples of current work toward SALCC goals

Facilitate collaboration – Goal 3

Initiate focused dialogue with select stakeholder groups.

Priority: Private landowners.

Promote data integration and sharing – Goal 4

Working across LCC boundaries in the Southeast to create a Conservation Planning Atlas

Evaluate and Report Progress - Goal 5

- Annual Report
- Monthly Reports
- Web site
- Newsletter
- Web Forum

Partnership Committee

- Albemarle-Pamlico Natural Estuary Program
- Southeast Aquatic Resource Partnership
- Atlantic Coast Joint Venture
- Atlantic Coast Fish Habitat Partnership
- Southeast Partners in Amphibian and Reptile Conservation
- Eastern NC / SE Virginia Strategic Habitat Conservation team
- South Atlantic Alliance

A diversity of investors

- 6 staff positions funded by 4 agencies

- offices provided by NC Wildlife Resources Commission

- an active web community of almost 600 members from over 70 different organizations

SALCC Next Steps

- Establish conservation priorities
- Deliver and evaluate early products
- Align science investments with gaps in blueprint
- Broaden partnership
- Develop strategic conservation issues
- Link SALCC blueprint to other LCCs and partnerships

SECOORA

Southeast Coastal Ocean Observing Regional Association

What is SECOORA doing?

1. WFS
2. Beach Water Quality
3. Governors' South Atlantic Alliance
4. SECOORA Projects

Students from Beaufort High School, SC deploy a BOB.
Photo: Megan Treml, SECOORA

SECOORA 2012 Projects

SECOORA is one of 11 Regional Associations established nationwide through the US Integrated Ocean Observing System (IOOS). Our primary source of funding is via US IOOS through a 5-year cooperative agreement titled *Coordinated Monitoring, Prediction and Assessment to Support Decision-Makers Needs for Coastal and Ocean Data and Tools*, but we were recently awarded funding via a NOAA Regional Ocean Partnership grant through the Governors' South Atlantic Alliance (Alliance).

IOOS Funding

- The FY12 US IOOS funding supports a number of projects that fall within the five main goals below. A team of Principal Investigators (PIs) coordinates these efforts.

SECOORA 2012 Projects

Goal 1: Sustain SECOORA as a Regional Information Coordination Entity

- Ensure Stakeholders Inform RA Priorities and RCOOS Development and Implementation
- Coordinate and Implement a Conceptual Operations Plan for a Southeast (SE) RCOOS
- Mapping the Future of Observing in the Southeast

Goal 2: Sustain an Observing Subsystem for the SE

- Sustain Moored and Coastal Stations
- Ocean Observing Supports Recreational Opportunities at Local Florida Park
- Marine Weather Forecasting in the Carolinas
- Operate and maintain the priority HF Radars

SECOORA Projects

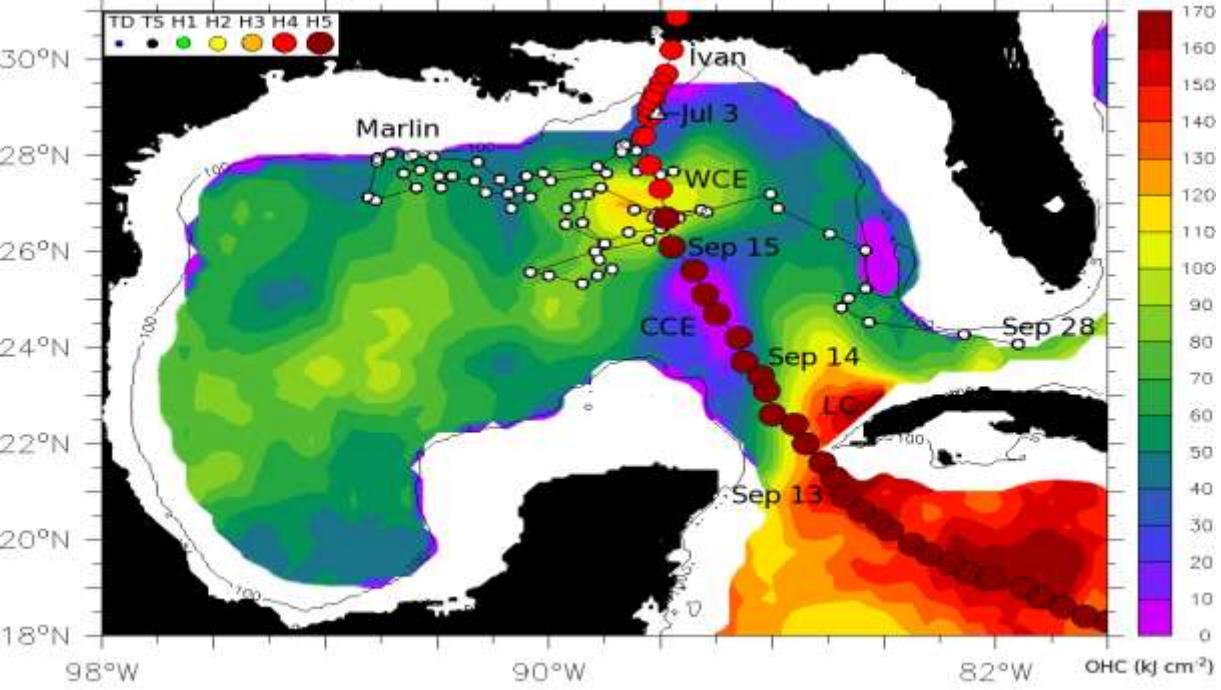
Goal 3: Support a Multi-Scale Multi-Resolution Modeling Subsystem

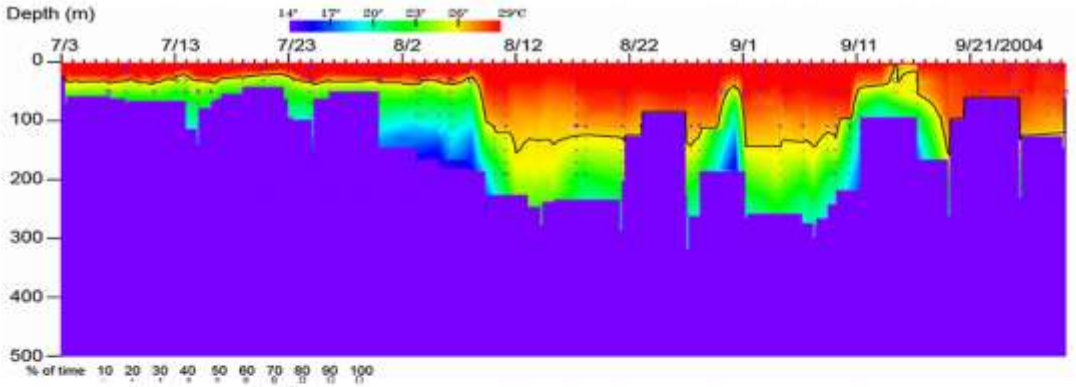
- Support Regional and South Atlantic Bight (SAB) Subregional Circulation Modeling
- Implement Forecasting of Storm Surge, Inundation, and Coastal Circulation
- Provide Species-specific Habitat Models that Integrate Remotely Sensed and In Situ Data to Enhance South Atlantic Fisheries Management Council (SAFMC) Stock Assessments
- Improve Beach/Shellfish Water Quality Advisories

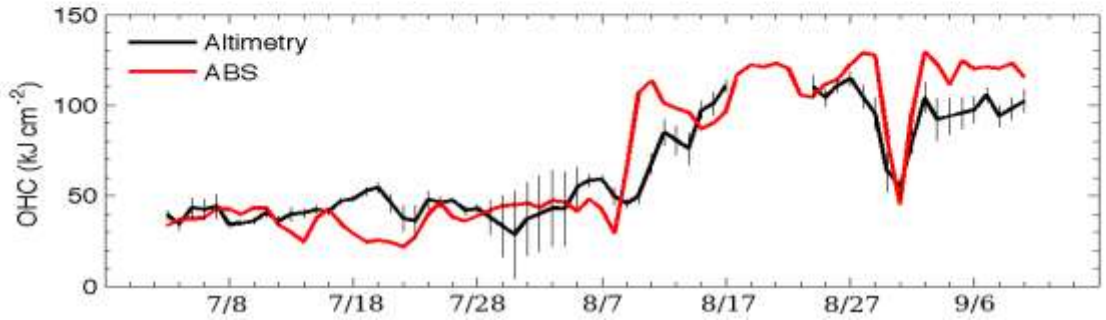
Goal 4: Enhance the Data Management and Communication (DMAC) Subsystem

- Service Data Providers and Capture Data
- Provide Information to Users and Stakeholders Rapidly and Effectively
- Coordinate/Collaborate data management efforts with U.S Integrated Ocean Observing System (IOOS®) on biological data services and SOS reference implementations
- Achieve Operational Status. (Limited implementation due to funding levels)

SECOORA Member Activities Linking Sattlelight Oceanographic Information and Fish Movement







Ivan (2004) track and intensity (colored circles) relative to OHC product using SMARTS and the track of a tagged blue marlin from 3 Jul to 29 Sept.

Blue marlin profiles of T(z) using a PAT (data courtesy of Ault and Luo UM) and Rooker (TAMU).

Comparison of OHC from altimetry and blue marlin in fish coordinate system.

SMRU CTD Tags Developed Under ONR Grant.

- Cost is $4K per tag (less for higher volumes).
- Up to 50,000 data transmissions over a year at 4-sec intervals.

High Resolution:

1. Temperatures: -5 to 35C; Accuracy 0.005C Precision 0.001C;
2. Conductivity: 0 to 80 mS/cm; 0.01 mS/cm; 0.002 mS/cm
3. Pressure: 0-2000 dBar; Accuracy 2dBar; Resolution 0.05 dBar

- Wet/dry sensor signals the tags to transmit via ARGOS GTS.
- Glider Cost O($100 to 200K) and 24/7 operations-Maintenance Costs are large-Avoid LC/GS complex.
- Floats lower cost ($40 to 80K), but have to avoid LC/FC/GS.
- AX……Require aircraft time (difficult to get time for full up ocean missions during hurricanes to resolve mesoscale ocean structures).
- **Note $400K yields 5M data points/profiles!**

Governors' South Atlantic Alliance

North Carolina • South Carolina • Georgia • Florida

Support for GSAA Activities

NOAA Regional Ocean Partnership Funding Program

- FY2011 Funding Competition
  - GSAA Proposal Package Submitted, December 2010
  - Two Grants Secured
    - Total = $1,062,431
    - Programmatic - Develop a multi-state and regional framework for CMSP in the Southeast U.S. ($784,431)
    - Administrative - Continued development of the GSAA ($278,827)
- FY2012 Funding Competition
  - GSAA Proposal Package Submitted, March 2012
  - One Grant Secured
    - Total = $276,00
    - Programmatic - Develop a multi-state and regional framework for CMSP in the SE U.S. (includes admin)

SOUTHEAST AQUATIC RESOURCES PARTNERSHIP

SARP

Friends of GTM Research Reserve - *GTMNERR Community Oyster Shell Recycling and Living Reef Construction Project*

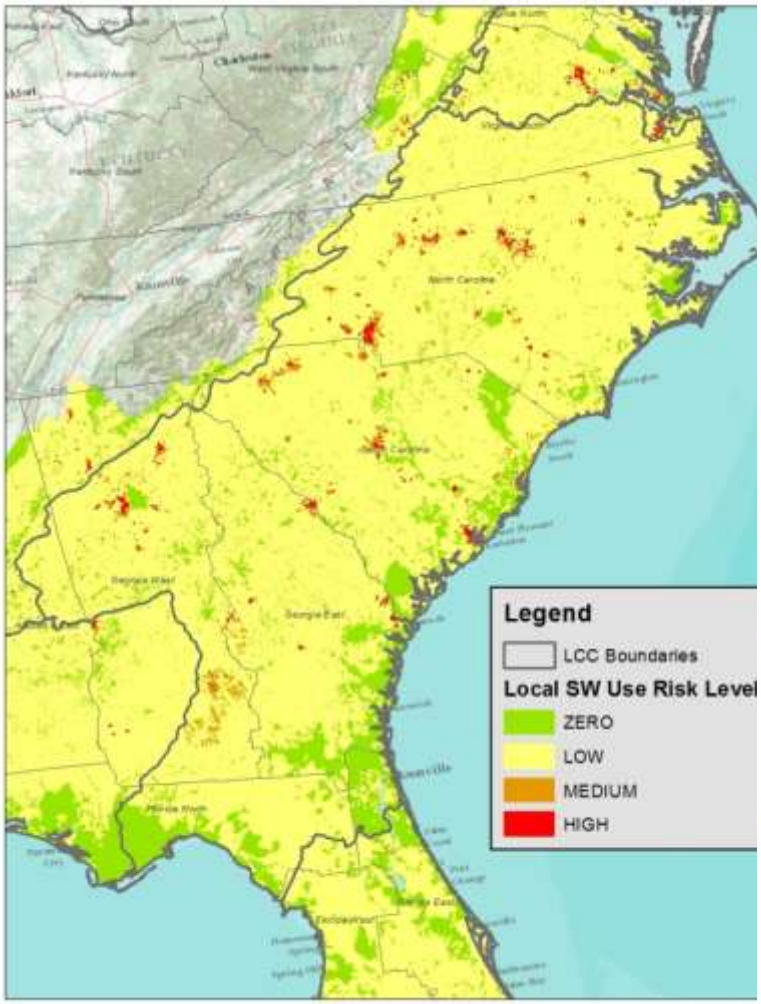
- Establish an oyster shell recycling program for St. Johns County, Florida
- Construct a living shoreline
- Plant spartina grass within the boundaries of the new reef to further protect the shoreline and provide nursery habitat for marine species at the Guana Tolomato Matanzas National Estuarine Research Reserve

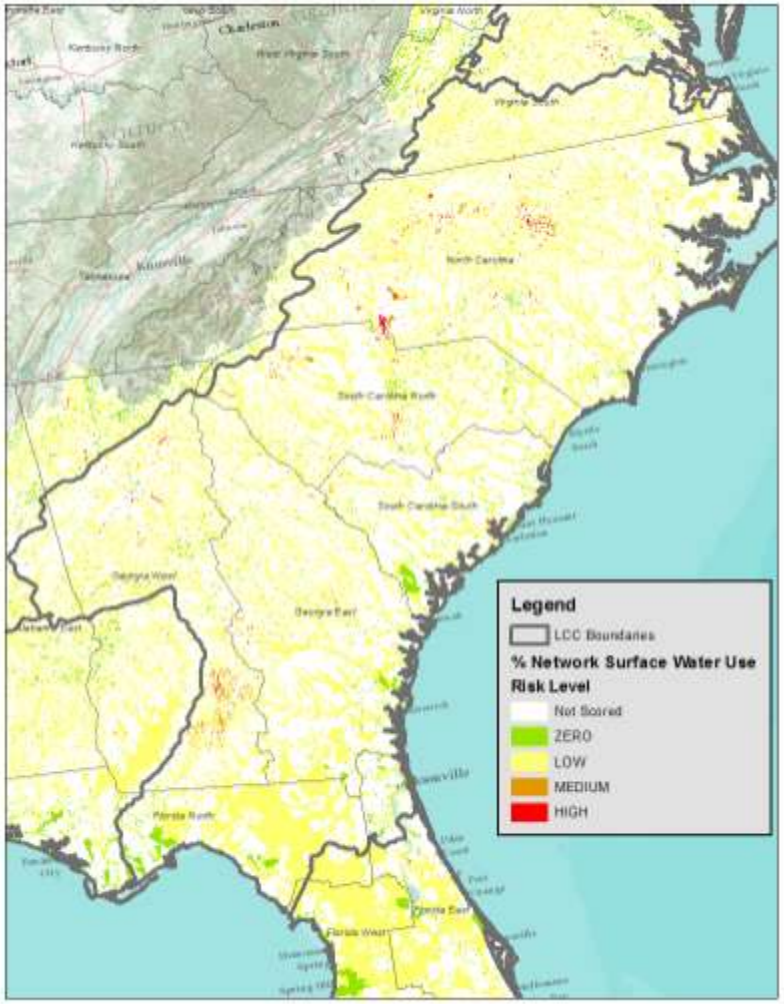
The Cape Fear River Partnership

Photo credit: NOAA

- NOAA and partners are working together to improve the health of the Cape Fear River for migratory fish
- They are developing an action plan that will:
  - Identify threats to healthy migratory fish populations
  - Outline actions to improve water quality, habitat conditions, and fish passage
  - Determine community and economic benefits of improved migratory fish populations
- Projects will implement the plan – dam removal projects, stream restoration projects (streambank and riparian buffers), easements, landowner incentive programs

Local and Network Risk of Flow Alteration from Surface Water Use





SARP/SALCC Instream Flow Resource Workshop

Held April 10-12, 2012 in Savannah, GA

Attended by 40 regional aquatic experts

Objectives:

1. Review Instream Flow Resources
2. Prioritize IF Research Needs

Outcomes:

1. SALCC Instream Flow Research Plan
2. Instream Flow Research Consortium

SALCC Instream Flow Research Plan

The twelve instream flow research priorities identified at the Savannah workshop give the SALCC a clear direction forward.

The top tier priorities called for more information about:

- **groundwater** interactions with surface water flows;
- **tools to communicate** the importance of instream flows;
- **tools to facilitate analysis of existing data** for flow-ecology relationships; and
- interactions of **stream temperature** with flow alterations in southern rivers.

The second tier of priorities showed the value of going deeper in the development of the instream flow resources for the region, particularly in the analyses of **impacts of dams and water use** on flows.

Ecosystem Tools - Links

- SAFMC Dashboard
  http://ocean.floridamarine.org/safmc_dashboard/
- SAFMC Fisheries
  http://ocean.floridamarine.org/SA_Fisheries/
- SAFMC EFH
  http://ocean.floridamarine.org/sa_efh/
- SAFMC Managed Areas
  http://ocean.floridamarine.org/safmc_managedareas/
- SAFMC Atlas
  http://ocean.floridamarine.org/safmc_atlas/