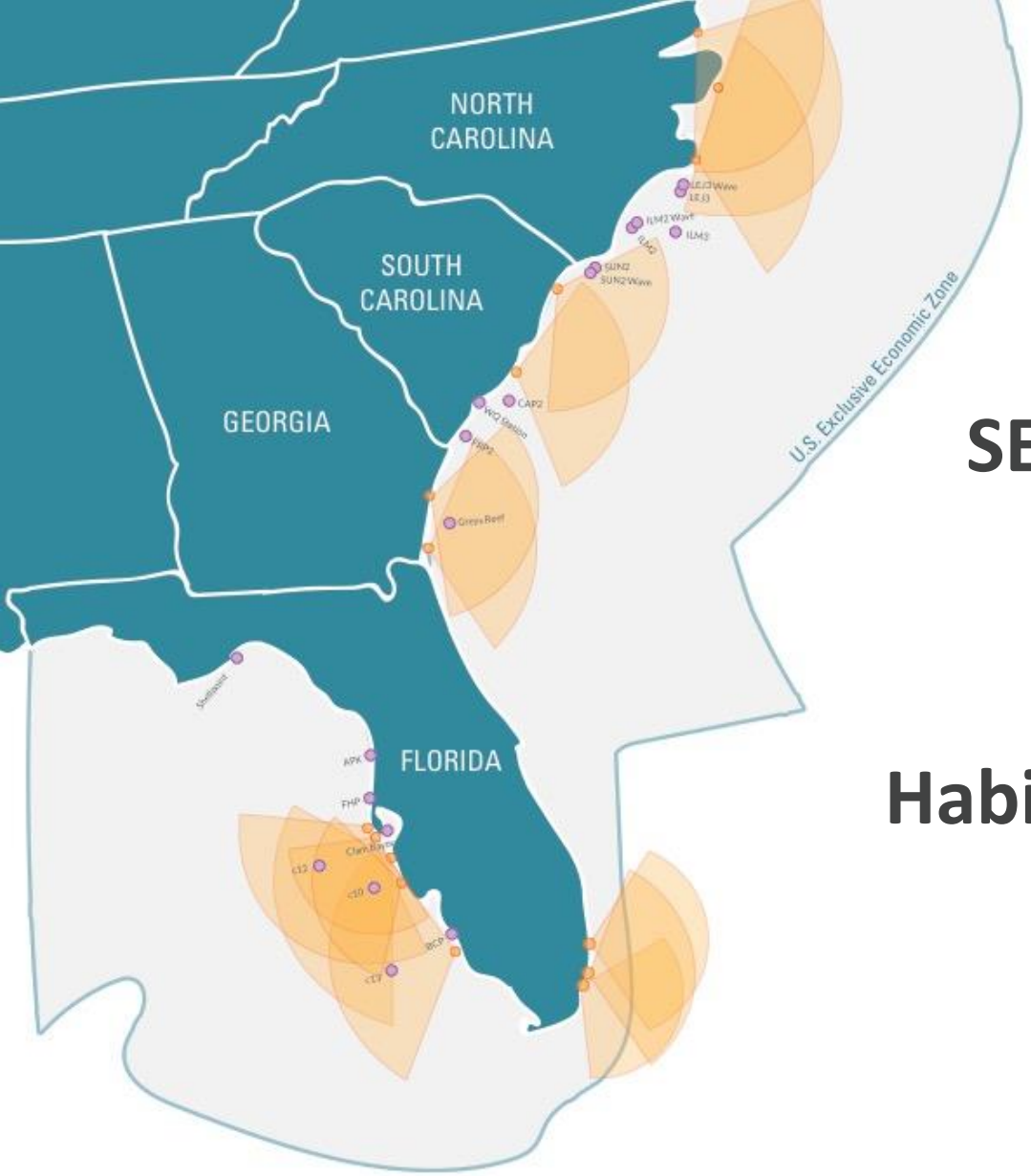


SECOORA

SECOORA Briefing

SAFMC
Habitat Advisory Panel
May 15, 2018

Debra Hernandez
Executive Director

IOOS Integrated Ocean Observing System

What we do …

SECOORA's MISSION

Observe, understand, and increase awareness of our coastal ocean - promoting knowledge, economic and environmental health through strong regional partnerships.

www.secoora.org

SECOORA Strategic Plan 2016-2020

MISSION

SECOORA's mission is to observe, understand, and increase awareness of our coastal ocean; promoting knowledge, economic and environmental health through strong regional partnerships.

5 YEAR VISION

SECOORA is the recognized leader, valued partner, and go to source for coastal ocean information in the southeast.

CORE VALUES

We believe in...

Scientific integrity, technical excellence, and innovation

Inclusive and **collaborative partnerships**

Active stewardship of coastal ocean ecosystems

Accessible useful information for addressing societal needs

Leadership in coastal ocean science

Science based discovery and decision-making

Positive and supportive SECOORA working environments

STRATEGIC GOALS

1 Increase exposure and broaden usage of SECOORA's information and products

Strategies:

- Improve web-based information system and web presence.
- Provide state of the art tools, including phone apps, data analysis tools and decision support tools, and information on how to use the tools
- Implement an effective outreach strategy to reach priority user groups, such as mariners, fisheries managers, marine planners, etc.

2 Utilize a prioritized science-justified ocean observing system plan to guide and inform decision making and implementation

Strategies:

- Regularly review status of Coastal Ocean Observing System technologies and advancements
- Develop agreement on the Regional Coastal Ocean Observing System Plan utilizing existing proposal, plans and documents
- Utilize the RCOOS plan for funding opportunities

3 Expand partnerships – including membership and stakeholders

Strategies:

- Outreach to currently under-represented sectors to participate in SECOORA activities and initiatives
- Develop new services, and better market current services, including benefits for members
- Identify and promote opportunities for potential partners (non-members) to engage in SECOORA activities and initiatives

4 Engage and inform students and the public in ocean observing

Strategies:

- Support citizen-science opportunities
- Engage students in problem solving using ocean observing data
- Establish our researchers and program managers as resources for students and the general public
- Identify and pursue cooperative educational funding opportunities

5 Improve SECOORA's organization capabilities

Strategies:

- Expand & diversify funding that advances SECOORA's mission
- Ensure SECOORA's operational & gov-ernance structure enables us to achieve our vision
- Have an effective marketing and out-reach strategy
- Ensure effective implementation of all grants, including the IOOS grant

Who is SECOORA?

Leaders in the coastal ocean sciences

SECOORA Members

ROSENSTIEL SCHOOL of MARINE & ATMOSPHERIC SCIENCE
MIAMI

MOTE MARINE LABORATORY

FLORIDA INSTITUTE OF TECHNOLOGY

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

Surfline KNOW BEFORE YOU GO

FAU FLORIDA ATLANTIC UNIVERSITY

UNIVERSITY OF SOUTH CAROLINA Arnold School of Public Health

Duke NICHOLAS SCHOOL OF THE ENVIRONMENT DUKE UNIVERSITY MARINE LAB

South Atlantic Fishery Management Council "To Conserve and Manage"

STATE OF FLORIDA FIO INSTITUTE OF OCEANOGRAPHY

SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

GEORGIA AQUARIUM

RDSEA INTERNATIONAL

FLORIDA STATE UNIVERSITY 1851

ATLANTIC OCEANOGRAPHIC & METEOROLOGICAL LABORATORY NOAA

GeoOptics

USF UNIVERSITY OF SOUTH FLORIDA COLLEGE OF MARINE SCIENCE

NOAA in the Southeast and Caribbean Region

USGS science for a changing world

Dialytics

Coastal Studies Institute

ECU

WeatherFlow Better Data. Better Decisions.

Skidaway Institute of Oceanography

NORTH CAROLINA STATE UNIVERSITY

OCEAN TRACKING NETWORK

FATHOM SCIENCE UNDERSTANDING THE DEPTHS

Marine Science RESEARCH INSTITUTE JACKSONVILLE UNIVERSITY

OAP NOAA OCEAN ACIDIFICATION PROGRAM

HARBOR BRANCH FLORIDA ATLANTIC UNIVERSITY

UNIVERSITY OF SOUTH CAROLINA College of Arts and Sciences

National Marine Sanctuaries — Southeast, Gulf of Mexico, and Caribbean Region of the Office of the National Marine Sanctuaries

ROFFS Roffer's Ocean Fishing Forecasting Service Inc.

SRI International

UNCW

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

OTT Hydromet

Kennesaw State University

MIAMI-DADE COUNTY

UF UNIVERSITY of FLORIDA

RPS Evans-Hamilton

Sea Grant S.C. Sea Grant Consortium

FATHOM SCIENCE UNDERSTANDING THE DEPTHS

Governance

Structure

- 501(c)3 nonprofit
- 17 Member Board
  - Geographic distribution
  - Sector distribution
  - Conflict of interest policy
- Staff
  - Executive Director
  - RCOOS Manager
  - Business Manager
    - Part-time bookkeeper
    - Auditor (contractor)
  - Communications Director

Membership

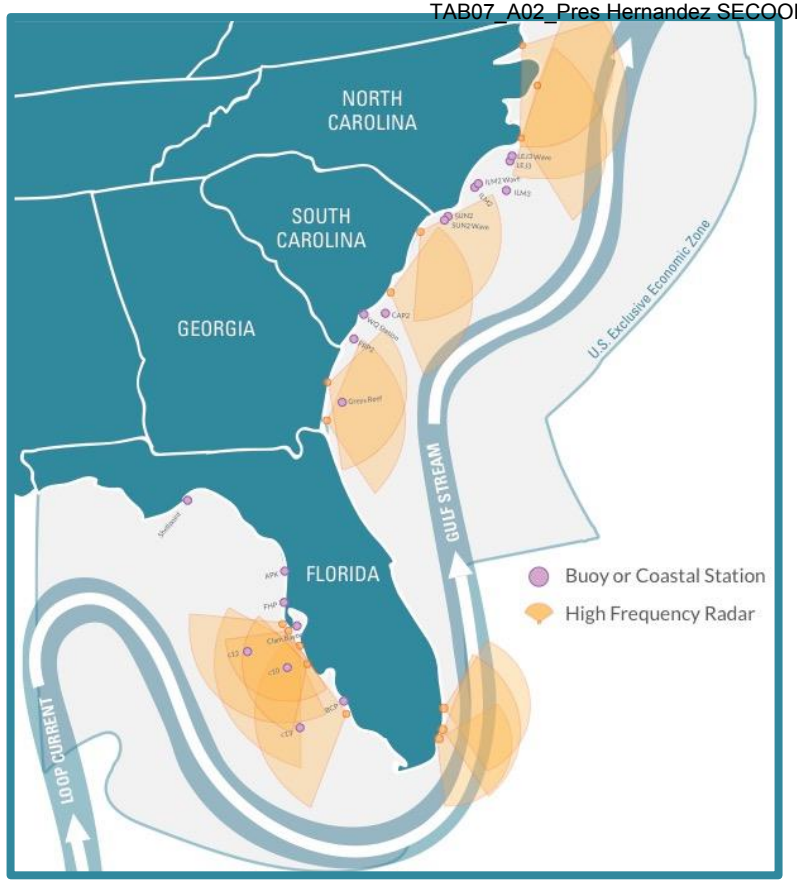
- Dues:
  - Sustaining: $3000 annual
  - Institutional: $1000 annual
  - Individual: $250
  - Student: TBD
- Sectors:
  - Academic
  - Private sector
  - Other
    - Nonprofits
    - State & local agencies

Funding: Primary source – 5-year NOAA IOOS Cooperative Agreement
Nonprofit – able to receive money from multiple sources

13 HF RADARS

13 BUOYS

6 COASTAL STATIONS

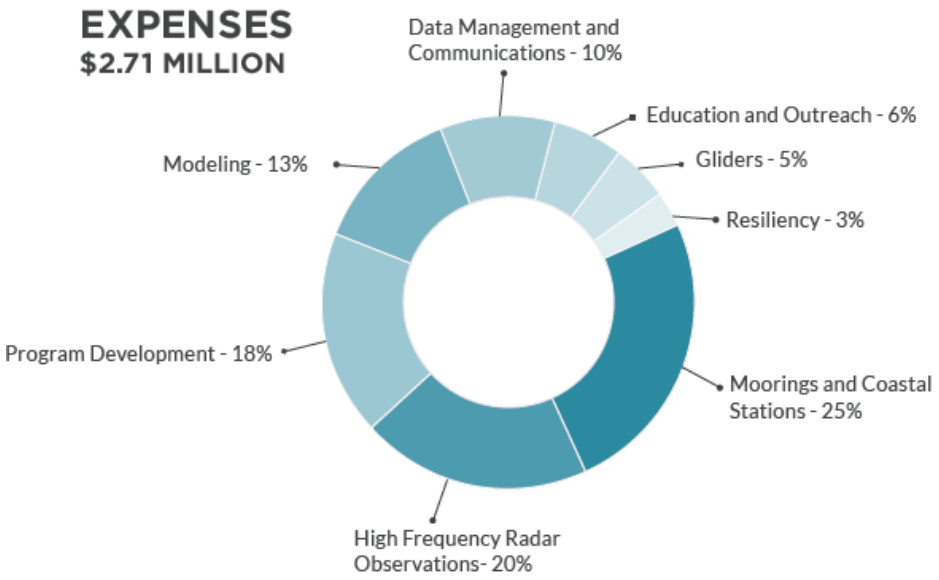


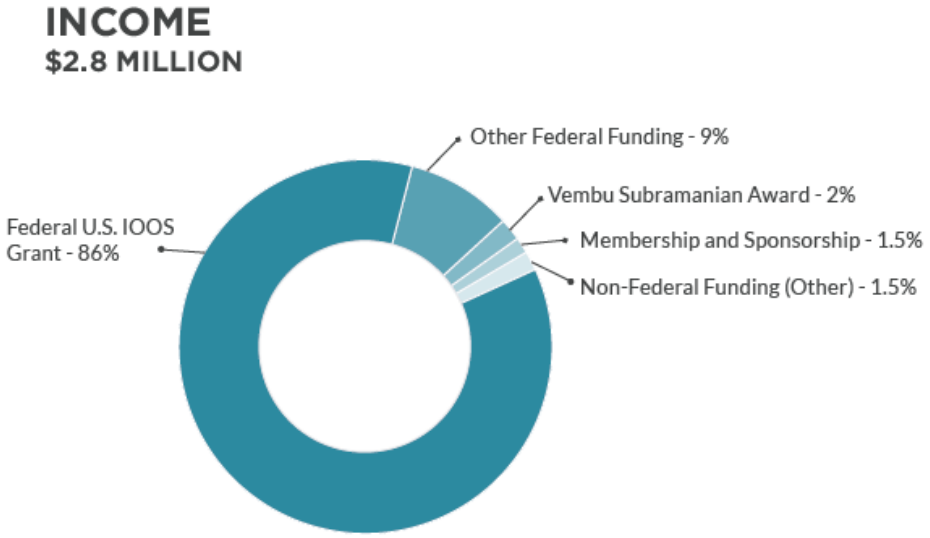
6 GLIDER DEPLOYMENTS A YEAR

Sustained Observations

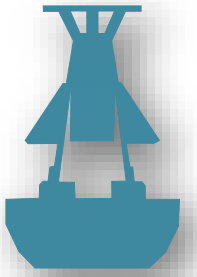
10-20 year data records (except gliders)

Annual Investment (2017 Numbers)

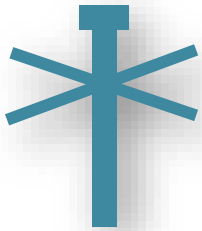




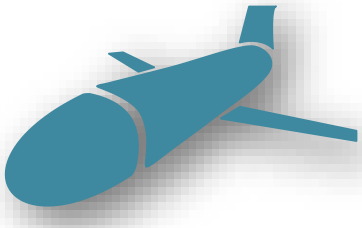
73% of budget is for observing, modeling and data management



25%: Buoys & Coastal Stations



20%: High Frequency Radars



5%: Glider Observatory

23%: Data Management / Products and modeling

Budget Outlook

- IOOS Regional funding:
  - FY17: $30.7M
  - FY18: $35M
    - 14% increase … pending ($4.3M)
- Gaps campaign
  - High frequency radar
  - Glider missions

Southeast: Saving Lives, Supporting Fisheries and Detecting HABs

Information gathered from gliders along the Southeast coast is critical for predicting riptides, optimizing fisheries management models, improving hurricane intensity forecasts and detecting marine mammals and HABs.

Certification & Data Management

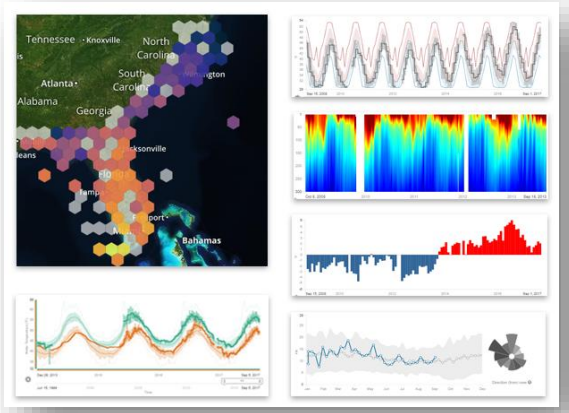
SECOORA
meets federal standards:

- data gathering,
- management and
- long-term archiving

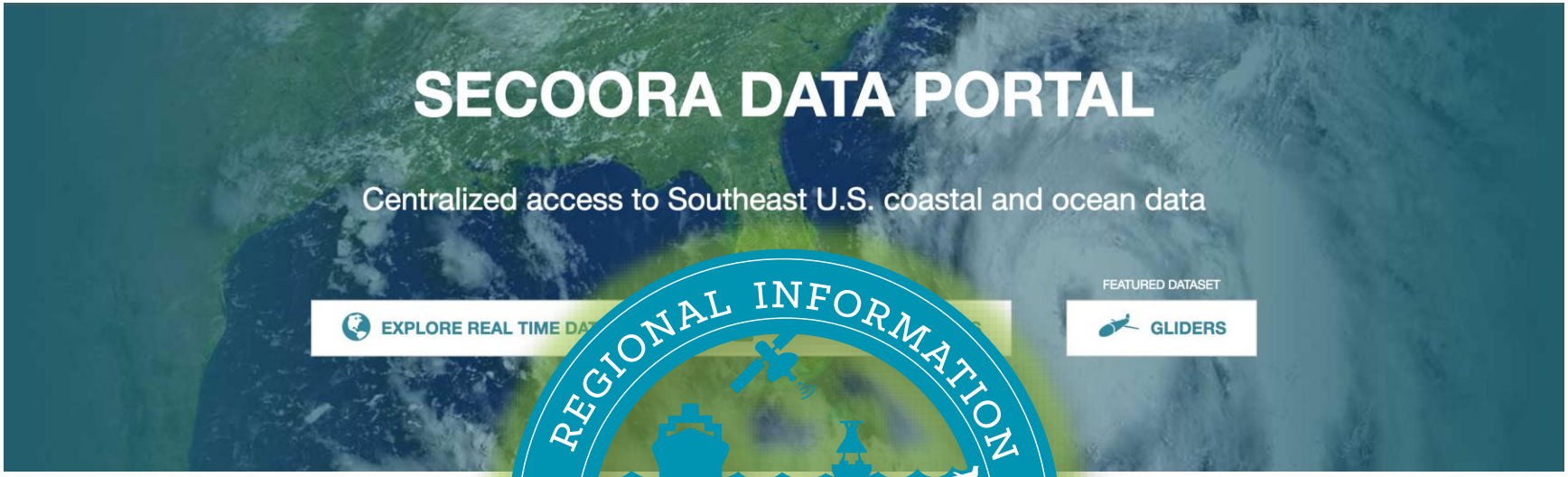
Operate:

- inclusively,
- transparently, and by
- soliciting input.

Axiom Data Science maintains SECOORA's data management and data assembly centers (DACs). The DACs are highly redundant to support recovery in the event of a failure.



Data Management & Communication (DMAC)



REGIONAL INFORMATION COORDINATION ENTITY
CERTIFIED
INTEGRATED OCEAN OBSERVING SYSTEM
2017

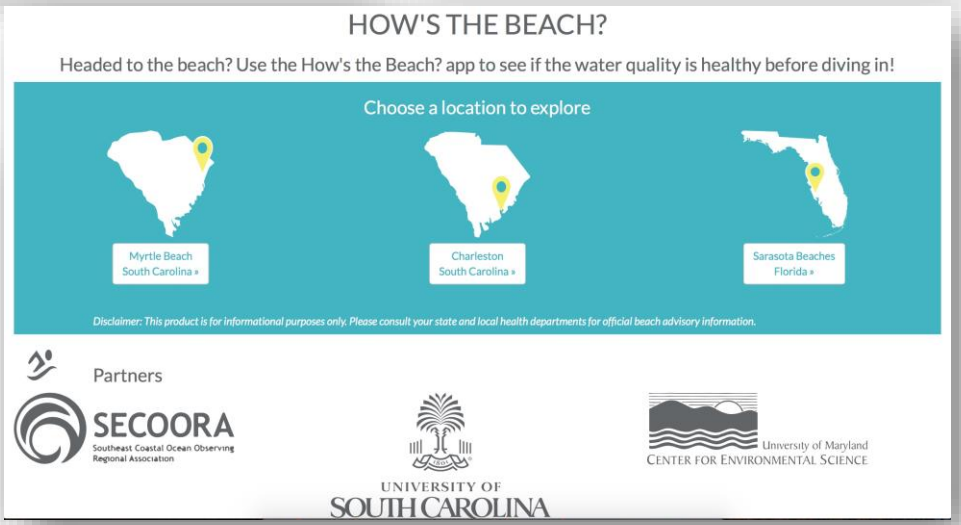
Gulf of Mexico Investment

30% of observing budget

- 5 high frequency radar
- 5 coastal stations
- glider obs support
- 3 buoys
- 2 non real-time subsurface stations
- 1 coastal tower

~ 30% overall: $800,000

- models
- data management
- governance, development, outreach



Near-term Priorities

- Hurricane recovery
- Acoustic sensors
  - Big Carlos Pass
  - Added to 4 buoys off Carolinas
- Filling radar gaps
- Increasing the number and utility of glider missions
- Adding OA sensors
- Student opportunities

Hurricanes Irma and Maria: $1M

Non-operational or damaged:

9 of 13

High Frequency Radars are damaged or destroyed

9 of 18

Buoys and Coastal Stations are damaged or destroyed

Capers Nearshore (CAP2) (NBDC 41029)
55 mph
Offshore 15 miles, NE of the Charleston Harbor Entrance
September 11, 2017 1:00 PM EDT
UNCW CORMP / SECOORA / US IOOS

Fripp Nearshore, SC (FRP2) (NBDC 41033)
54 mph
Offshore 8.5 miles, SE of Fripp Inlet, South Carolina
September 11, 2017 8:00 AM EDT
UNCW CORMP / SECOORA / US IOOS

Greys Reef NMS (NBDC 42013)
60 mph
Offshore 46 miles, SE of Savanah, Georgia
September 11, 2017 4:50 AM EDT
UGA / NBDC / SECOORA / NOAA OAP

Shell Point Coastal Station
56 mph
Shell Point, FL
September 11, 2017 8:00 AM EDT
USF CMS COMPS / SECOORA / US IOOS

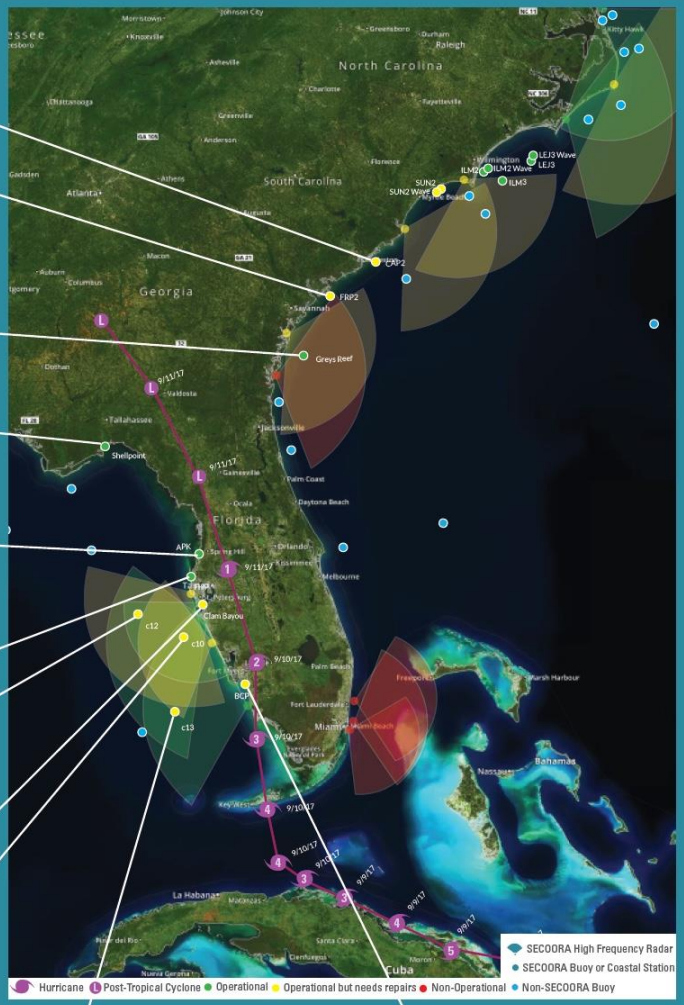
Aripeka Coastal Station
45 mph
Aripeka, FL
September 11, 2017 5:54 AM EDT
USF CMS COMPS / SECOORA / US IOOS

Fred Howard Park Coastal Station
84 mph
Fred Howard Park - Tarpon Springs, FL
September 11, 2017 1:18 PM EDT
USF CMS COMPS / SECOORA / US IOOS

C12 Buoy (NBDC 42022)
71 mph
Offshore 70 miles, SW of St. Petersburg, Florida
September 11, 2017 1:00 AM EDT
USF CMS COMPS / SECOORA / US IOOS

Clam Bayou Coastal Station
52 mph
Clam Bayou – Gulfport, FL
September 11, 2017 1:00 AM EDT
USF CMS COMPS / SECOORA / US IOOS

C10 Buoy (NBDC 42013)
81 mph
Offshore 27 miles, SW of Sarasota, FL
September 11, 2017 2:00 AM EDT
USF CMS COMPS / SECOORA / US IOOS



C13 Buoy (NBDC 42023)
67 mph
Offshore 86 miles, SW of Fort Myers, Florida
September 10, 2017 4:30 PM EDT
USF CMS COMPS / SECOORA / US IOOS

Big Carlos Pass
115 mph
Big Carlos Pass, FL
September 10, 2017 6:00 PM EDT
USF CMS COMPS / SECOORA / US IOOS

Student Opportunities

Clam Bayou Outreach and Education

200+ Undergraduate Students

14 Lab visits 2014-2018

YSI a xylem brand

COMPS Coastal Ocean Monitoring and Prediction System

USF University of South Florida College of Marine Science

Vembu Subramanian Scholarship

SECOORA is continuing Vembu's mentoring legacy and helping the next generation of ocean experts by **sponsoring an annual award of up to $2500.**

This annual award can support one undergraduate student, graduate student, or early career professional for a research project or to present at a professional meeting in a marine or computer science field relevant to SECOORA.

SECOORA Data Challenge – 2017 Winners

Undergraduate Category

SPLASSH into OA (Ocean Acidification) with SECOORA's pH Data

John Mwaniki,
Computer Science, KSU

Graduate Category

The Economics and Spatial Flexibility of Fisheries and Recreational Water Operations in Biscayne Bay, Florida

Samantha Dowdell,
University of Miami

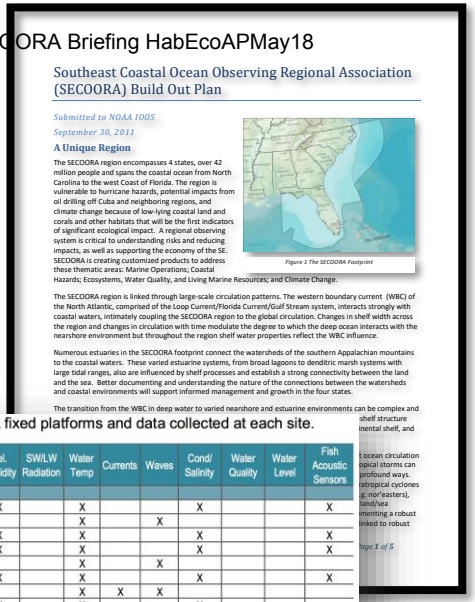
Other Category

Development of a 5-Year Daily, Cloud-Free Sea Surface Temperature (SST) and Chlorophyll-a Reconstruction Dataset Using the Data Interpolating Empirical Orthogonal Functions (DINEOF) Method

Joseph B. Zambon, Ph.D.

Observation Plans

- 10-year Build-out Plan (2011)
- BOP Amendment (2017)
- "Technology plans" (2018)
  - High frequency radar
  - Moorings and coastal stations



Southeast Coastal Ocean Observing Regional Association (SECOORA) Build Out Plan

Submitted to NOAA IOOS
September 30, 2011

A Unique Region

The SECOORA region encompasses 4 states, over 42 million people and spans the coastal ocean from North Carolina to the west Coast of Florida. The region is vulnerable to hurricane hazards, potential impacts from oil drilling off Cuba and neighboring regions, and climate change because of low-lying coastal land and corals and other habitats that will be the first indicators of significant ecological impact. A regional observing system is critical to understanding risks and reducing impacts, as well as supporting the economy of the SE. SECOORA is creating customized products to address these thematic areas: Marine Operations; Coastal Hazards; Ecosystems, Water Quality, and Living Marine Resources; and Climate Change.

Figure 1 The SECOORA Footprint

The SECOORA region is linked through large-scale circulation patterns. The western boundary current (WBC) of the North Atlantic, comprised of the Loop Current/Florida Current/Gulf Stream system, interacts strongly with coastal waters, intimately coupling the SECOORA region to the global circulation. Changes in shelf width across the region and changes in circulation with time modulate the degree to which the deep ocean interacts with the nearshore environment but throughout the region shelf water properties reflect the WBC influence.

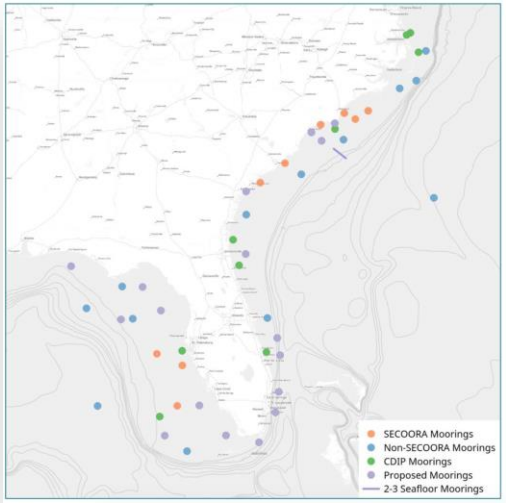
Numerous estuaries in the SECOORA footprint connect the watersheds of the southern Appalachian mountains to the coastal waters. These varied estuarine systems, from broad lagoons to dendritic marsh systems with large tidal ranges, also are influenced by shelf processes and establish a strong connectivity between the land and the sea. Better documenting and understanding the nature of the connections between the watersheds and coastal environments will support informed management and growth in the four states.

The transition from the WBC in deep water to varied nearshore and estuarine environments can be complex and

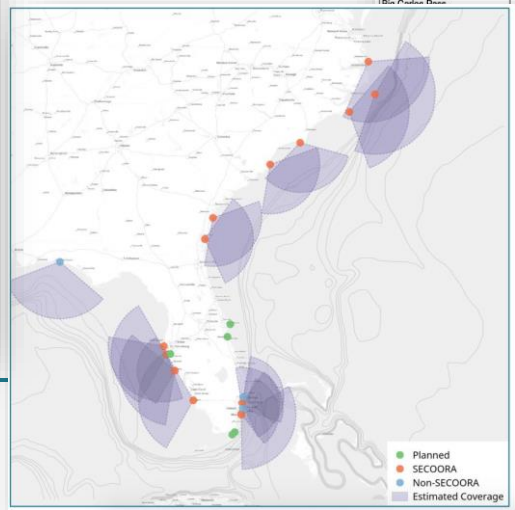
Table 2 provides a list of the 22 SECOORA fixed platforms and data collected at each site.

	Wind Spd, Gust, Dir.	Air Temp	Barometric Pressure	Rel. Humidity	SW/LW Radiation	Water Temp	Currents	Waves	Cond/ Salinity	Water Quality	Water Level	Fish Acoustic Sensors
UNCW Moorings												
LEJ3 - Outer Onslow Bay	X	X	X	X		X			X			X
LEJ3Wave						X		X				
ILM3 - Outer Onslow Bay	X	X	X	X		X			X			X
ILM2 - Inshore Onslow Bay	X	X	X	X		X			X			X
ILM2Wave						X		X				
SUN2 - Northern Long Bay	X	X	X	X		X			X			X
SUN2Wave						X	X	X				
CAP2 - Inshore Capers Island	X	X	X	X		X			X			
FRP2 - Inshore Fripp Island	X	X	X	X		X			X			
SC DNR Mooring												
Charleston Harbor Station*						X			X	X		
UGA OA Moorings												
OA sensor suite** on 41008	X	X	X			X		X	X			
USF Moorings												
C10 - WFS Central nearshore	X	X	X	X	X	X	X		X			
C12 - WFS Central offshore	X	X	X	X		X	X		X			
C13 - WFS South	X	X	X	X		X	X		X			
C11 - WFS Subsurface***						X	X	X				
C15 - WFS Subsurface***						X	X	X				
C21 - Tower	X	X	X	X		X	X	X	X			
USF Coastal Stations												
Shell Point	X	X	X	X		X					X	
Aripeka	X	X	X	X		X					X	
Fred Howard State Park	X	X	X	X							X	
Clam Bayou	X	X	X	X		X			X		X	
[illegible]	X	X	X	X		X			X		X	X

…ity, chlorophyll, FDOM, and water depth
…s Reef NMS. NDBC maintains buoy and UGA maintains OA and water quality sensors.
…pH, dissolved oxygen, turbidity, chlorophyll, water temp., and salinity



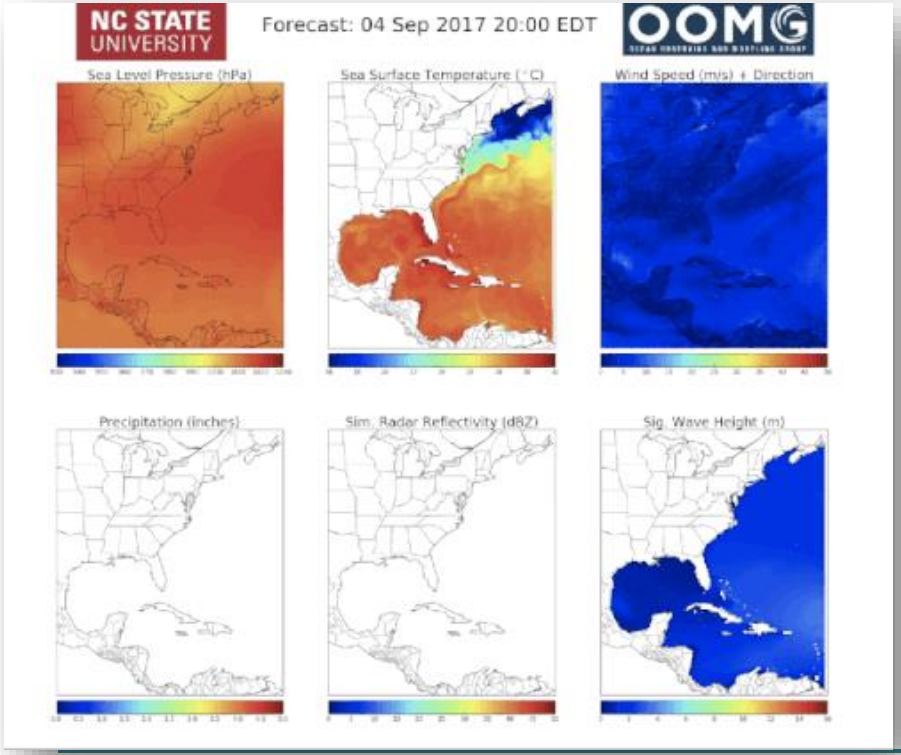
Map 2. Orange dots represent SECOORA funded coastal and offshore buoys. Green dots are CDIP WaveRider buoys deployed in the SECOORA region. Blue dots are non-SECOORA funded buoys (e.g. NOAA NDBC). Purple dots represent potential mooring locations identified and prioritized at the 2017 SECOORA annual meeting by members and stakeholders. The purple line off the coast of SC indicates the potential location for 2-3 non real-time sub-surface C-PIES which will help track the Gulf Stream.

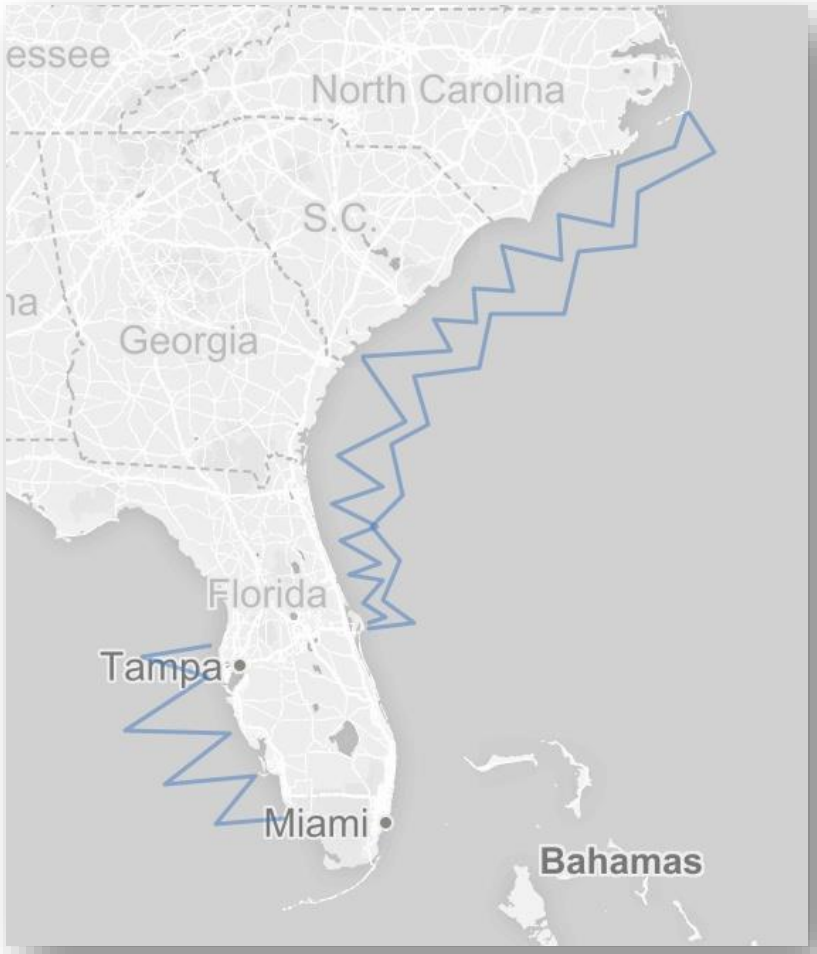


Map 1. High Frequency Radar within SECOORA domain. Green dots denote planned HFR deployment locations. Orange dots represent SECOORA funded HFR. The blue dots are non-SECOORA funded HFR operating in the region.

Technology Plans (continued)

- Gliders
- Models





Wednesday May 23, 2018

Supporting the Blue Economy: SECOORA Stakeholder Annual Meeting: 9:45 – 5:00 PM

1:30 – 2:45 PM	**Blue Economy Panel II: Fisheries Collaboration – Stories from the Field** *Objective: Highlight integrated physical oceanographic and biological research that supports fisheries management.* • Dr. John Quinlan, NOAA's Southeast Fisheries Science Center • Lad Akins, Reef Environmental Education Foundation • Ben Hartig, Commercial Fisherman and Former Chairman of South Atlantic Fishery Management Council

Thursday May 24, 2018

Data Access for Coasts and Oceans Workshop: SECOORA Public Data Portal, Analysis Tools and Practical Applications: 8:30 AM – 12:00 PM

Opportunities for Collaboration

- Ongoing … but room for improvement
  - Data sharing
  - Modeling
- Additional opportunities
  - Glider mission planning
  - High frequency data applications
    - Larval fish transport

Another Resource

What is it?

If we're going to make smarter decisions about how we use our oceans, we need to know more about them. That's the core idea behind The Nature Conservancy's South Atlantic Bight Marine Assessment (SABMA), a regional mapping product developed with the help of more than 40 marine conservation and spatial analysis experts.

What's in it?

- Regional baseline data on the distribution and condition of coastal wetlands, seagrass beds, oyster reefs, live hard-bottom habitats, bathymetry, sediment, sea turtles and marine mammals
- A combined "portfolio" that highlights areas where significant species, natural communities and ecological processes hold the greatest promise for conservation success
- Maps designed to serve a variety of users and uses, including to support decisions about conservation and resource use

Where is it?

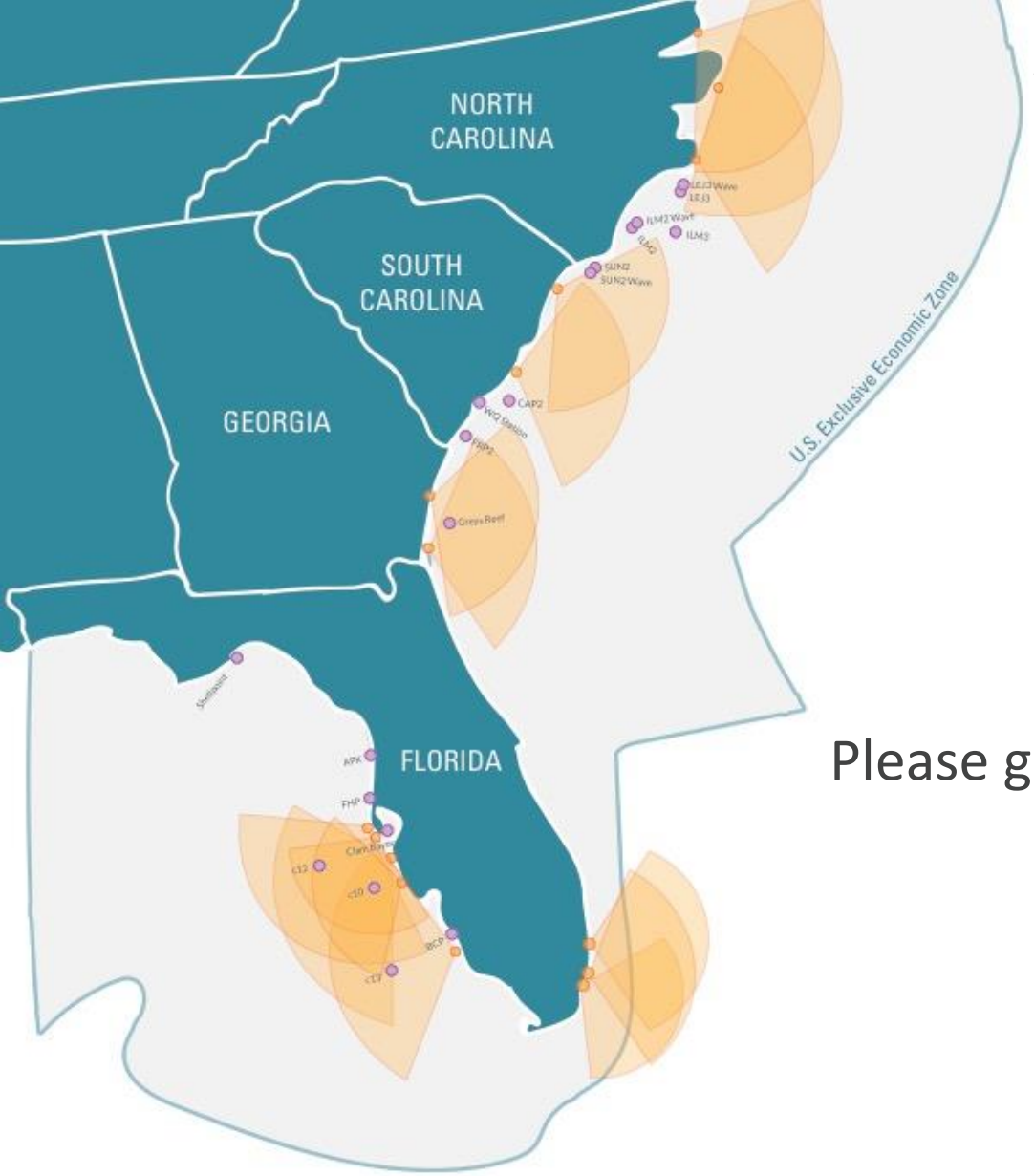
The full report, data and associated materials are available through the Conservancy's Conservation Gateway site:

http://nature.ly/marineSAtlanticBightERA

Financial support for SABMA was generously provided by the South Atlantic Landscape Conservation Cooperative and Southeast Coastal Ocean Observing Regional Association.

Contact Mary Conley at TNC

SECOORA



Website

Please go www.secoora.org on your phone!

IOOS Integrated Ocean Observing System

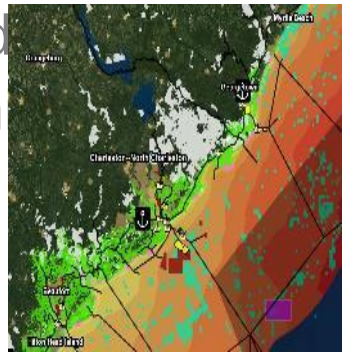
BACK UP SLIDES

South Atlantic Bight Marine Assessment (SABMA)

Opportunity to update existing information with **new data** and **improved analysis** that is **easily digestible** and can be used to **inform marine conservation work**.

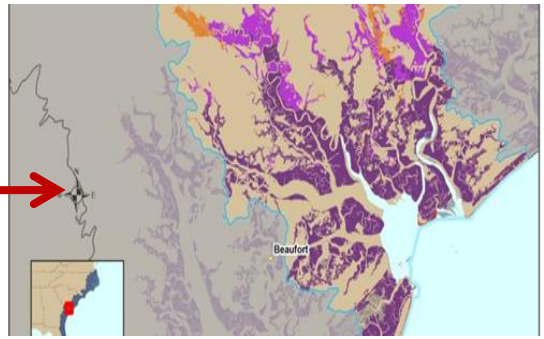
Science-based maps provide a backbone for all TNC strategies:

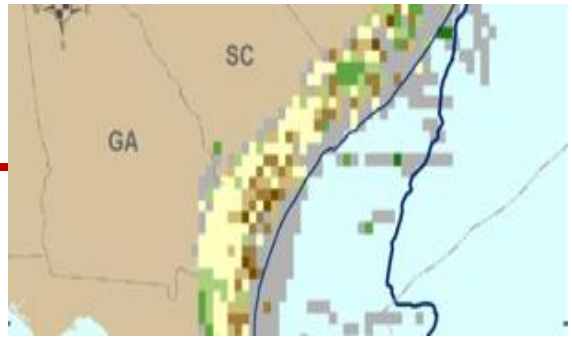
Oyster and Coral Reef Conservation and Restoration

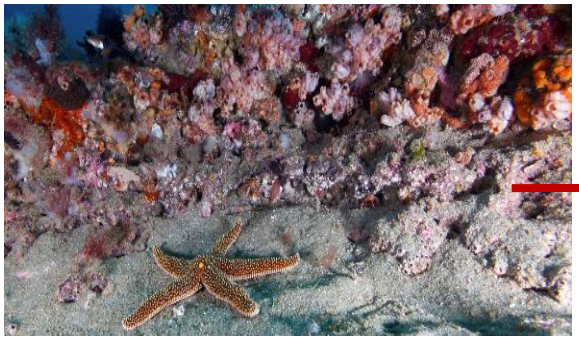


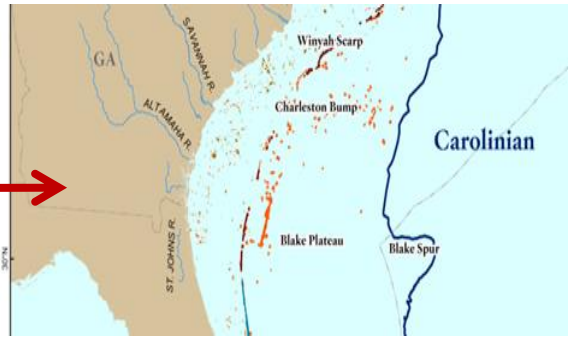
Three Primary Resource Areas:

COASTAL ECOSYSTEMS, MIGRATORY SPECIES, SEAFLOOR HABITATS









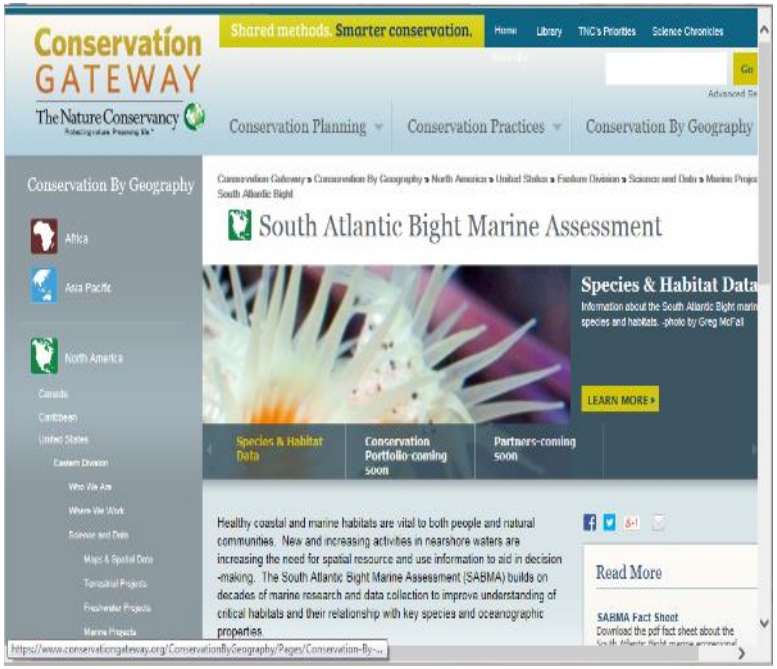
Accessing the SABMA Data and Report

The report, geodatabases, and metadata are available through the Conservation Gateway:

http://nature.ly/marineSAtlanticBightERA

Resources include:

- Final Report
- Geodatabases
- Story Maps
  - SABMA 101
  - Putting SABMA to Use



Science Needs

Formal Activities

- User Assessment (5-year cycle)
- Host stakeholder groups
  - FACT Animal Telemetry Network
  - Southeast Ocean & Coastal Acidification Network
  - Southeast Disaster Recovery Partnership
  - Governors' South Atlantic Alliance archive
- Membership
- Host workshops

Informal Activities

- Listen
- Sponsor meetings
- Participate
  - MTS
  - AGU
  - NAS

SECOORA Focus Areas

SECOORA provides:

- coastal and ocean data,
- tools, and
- services.

Four themes, correspond with U.S. IOOS societal goals, and are important to Southeast stakeholders.

Stakeholders include members, partners, and data users.

Marine Operations

- Safety, including support of Search and Rescue operations
- Marine Weather Forecasting
- Offshore Energy

Coastal Hazards

- Inundation
- Rip Currents

Ecosystems, Living Marine Resources and Water Quality

- Fish
- Water quality, including beach advisories and harmful algae blooms

Climate Variability

- Long-term data collection and analysis
- Ocean Acidification

Details: Hurricane damage

Tier 2 SECOORA Damages: Irma and Maria								
Lead Org	Station Name	Location	GPS Location	Station Type	Status Pre Irma	Lead	Status Post Irma & Maria	Total Cost to Repair/Replace
UNCW	LEJ3	NC	34.2073°N 76.9488°W	Buoy	Operational	Lynn Leonard	Fully Operational	$ [redacted]
UNCW	LEJ3Wave	NC	34.2073°N 76.9488°W	Waverider Buoy	Buoy removed for service prior to storms	Lynn Leonard	N/A	$ [redacted]
UNCW	ILM3	NC	33.9877°N 77.3617°W	Buoy	Operational	Lynn Leonard	Fully Operational	$ [redacted]
UNCW	ILM2	NC	34.1445°N 77.7183°W	Buoy	Operational	Lynn Leonard	Fully Operational	$ [redacted]
UNCW	ILM2Wave	NC	34.1445°N 77.7183°W	Waverider Buoy	Operational	Lynn Leonard	Fully Operational	$ [redacted]
UNCW	SUN2	NC	33.8373°N 78.4768°W	Buoy	Operational	Lynn Leonard	Partially Operational	$ [redacted] 2,825.37
UNCW	SUN2Wave	NC	33.8373°N 78.4768°W	Buoy	Operational	Lynn Leonard	Partially Operational	$ [redacted] 9,877.56
UNCW	CAP2	SC	32.8033°N 79.6238°W	Buoy	Operational	Lynn Leonard	Partially Operational	$ [redacted] 8,493.62
UNCW	FRP2	SC	32.2745°N 80.4187°W	Buoy	MET data reporting; CTD operational but internally logging	Lynn Leonard	Partially Operational; cables and potentially solar panels damaged	$ [redacted] 2,602.61
UGA	OA Sensors on mooring 41008	GA	31°24'0"N 80°52'5"W	Buoy	Operational	Scott Noakes	Operational	$ [redacted]
USF	C10	FK	27°10'22.80"N 82°55'26.40"W	Buoy	Operational	Robert Weisberg	Partially Operational	$ [redacted] 1,449.96
USF	C12	FL	27°30'18.00"N 83°44'27.60"W	Buoy	Operational	Robert Weisberg	Partially Operational	$ [redacted] 4,937.60
USF	C13	FL	26°0'36.00"N 83°5'9.60"W	Buoy	Operational	Robert Weisberg	Partially Operational	$ [redacted] 1,449.97
USF	Shell Point	FL	30°3'28.80"N 84°17'24.00"W	Shorebased Tower	Operational, CTD	Mark Luther	Operational	$ [redacted]
USF	Aripeka	FL	28°25'58.80"N 82°40'1.20"W	Shorebased Tower	Operational	Mark Luther	Operational	$ [redacted]
USF	Fred Howard Pa	FL	28°9'10.80"N 82°48'3.60"W	Shorebased Tower	Operational	Mark Luther	Operational	$ [redacted]
USF	Clam Bayou	FL	27°44'9.60"N 82°41'9.60"W	Shorebased Tower	Operational	Mark Luther	Partially Operational	$ [redacted] 9,514.86
USF	Big Carlos Pass	FL	26°24'14.40"N 81°52'51.60"W	Shorebased Tower	Operational	Mark Luther	Partially Operational	$ [redacted] 4,048.17
UNC Chapel Hill	HATY	NC	Cape Hatteras, NC	HFR CODAR	Operational	Harvey Seim	Partially operational	$ [redacted] 8,887.92
UNC Chapel Hill	DUCK	NC	Duck, NC	HFR CODAR	Operational	Harvey Seim	Operational	$ [redacted]
UNC Chapel Hill	CORE	NC	Core Banks, NC	HFR CODAR	Operational	Harvey Seim	Operational	$ [redacted]
USC	CSW	NC	Caswell Beach, NC	HFR WERA	Operational	George Voulgaris	Operational, needs repairs	$ [redacted] 8,606.61
USC	GTN	SC	Georgetown, SC	HFR WERA	Operational	George Voulgaris	Operational, needs repairs	$ [redacted] 8,522.17
SkIO	CAT	GA	St. Catherine's GA	HFR WERA	Operational	Dana Savidge	Operational, needs repairs	$ [redacted] 6,692.86
SkIO	JEK	GA	Jekyll Island, GA	HFR WERA	Operational	Dana Savidge	Non-operational	$ [redacted] 8,885.92
Univ. of Miami	STF	FL	Dania Beach, FL	HFR WERA	Operational	Nick Shay	Non-operational	$ [redacted] 72,760.91
Univ. of Miami	VIR	FL	Virginia Key, FL	HFR WERA	Operational	Nick Shay	Non-operational	$ [redacted] 52,760.92
Univ. of Miami	CDN	FL	Crandon, FL	HFR WERA	Operational	Nick Shay	Non-operational	$ [redacted] 52,760.91
USF	RDSR	FL	Redington Shores, FL	HFR CODAR	Operational	Cliff Merz / Robert Weisberg	Operational, repairs needed	$ [redacted] 29,581.22
USF	FDS	FL	Ft. DeSoto, FL	HFR WERA	Operational	Cliff Merz / Robert Weisberg	Operational	$ [redacted]
USF	VEN	FL	Venice, FL	HFR WERA	Operational	Cliff Merz / Robert Weisberg	Operational	$ [redacted]
USF	VENI	FL	Venice, FL	HFR CODAR	Operational	Cliff Merz / Robert Weisberg	Operational, repairs needed	$ [redacted] 25,597.04
USF	NAPL	FL	Naples, FL	HFR CODAR	Operational	Cliff Merz / Robert Weisberg	Operational	$ [redacted]
SECOORA Tier 2 Damage Estimates								$ [redacted] 1,010,256.17