

Making the Most of Ocean Observations through Data Management Innovation: “Observations” from the Southeast

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Outline

- **Setting the stage**
- **Challenges and opportunities**
- **The DM infrastructure for coastal / ocean observing**
- **Examples of integrative efforts**
- **Outcomes of integrative efforts**
- **What next**

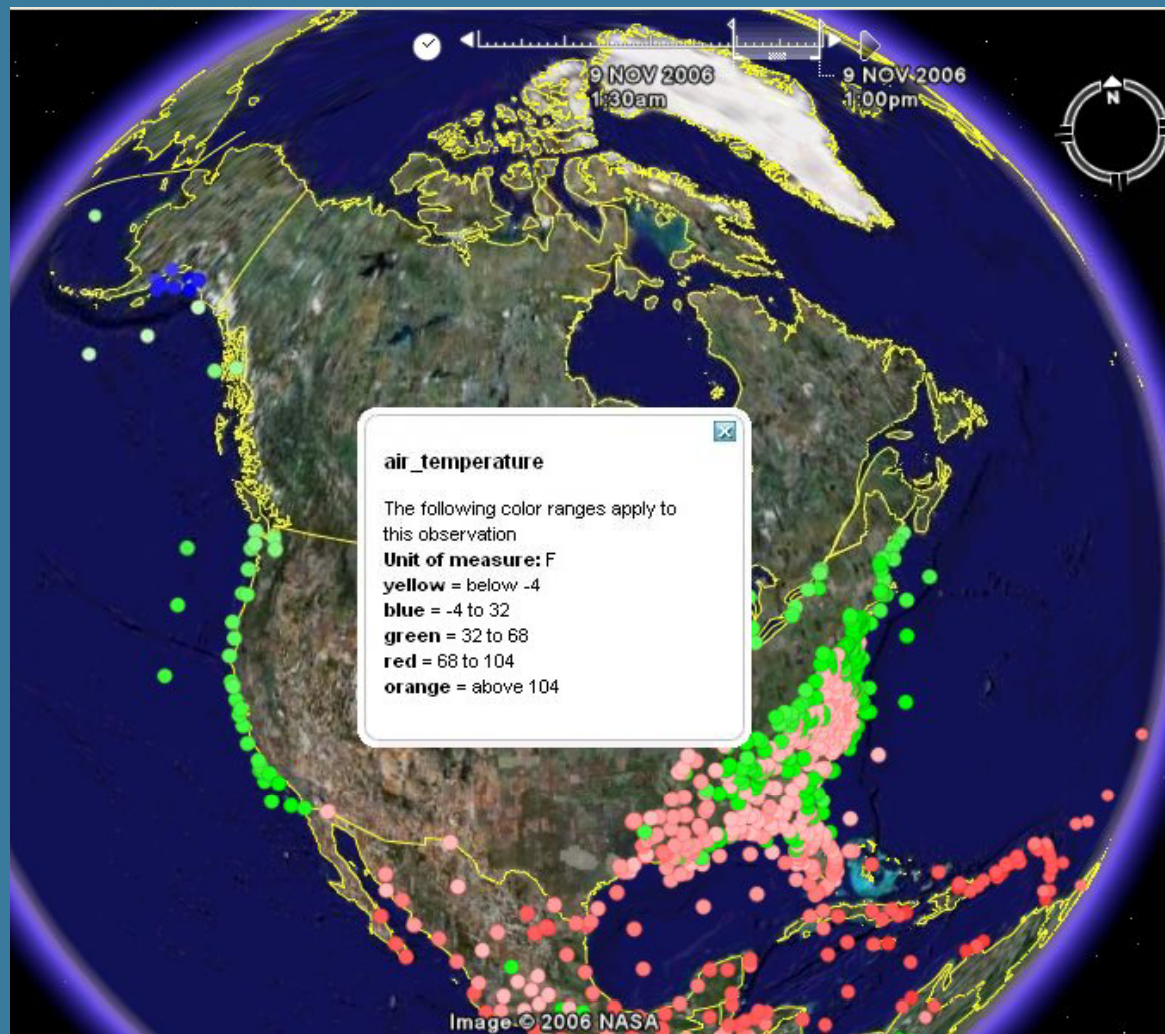
Setting the stage

From a DM / IT perspective, here is what we are hearing...

Coastal and ocean decision makers want to

- Develop decision support tools for
- Increase utility of existing federal and state observing system and remote sensing data
- Illustrate science – management application through integration of data

Setting the stage



Setting the stage

Super-National

Integrated Ocean Observing System®

National

NOAA NDBC Moored Buoys & C-MAN Stations

NOAA National Water Level Observation Network

NOAA NWS Network

NOAA NERRS System-wide Monitoring Program

USGS Stream Gauge Network



Setting the stage

Regional Association

SECOORA

Regional Monitoring Programs

Marine Resources Monitoring, Assessment & Pred.

Southeast Area Monitoring & Assessment Prgm.

Sub-regional Observing Systems

Carolinas RCOOS, COMPS

Challenges and opportunities

Major bottlenecks preventing integration of and utilization of existing data streams:

- **Access to data**
- **Insufficient density of appropriate data observations**
- **Inconsistent protocols and formats**
- **Turf (e.g. loss of identity)**

Challenges and opportunities

The issues become more complicated when data from multiple sources need to be aggregated

- Different standards
- Different applications
- Different cultures

How can we optimize the utility of information from multiple sources?

Challenges and Opportunities

Create interoperability among the many diverse, environmental coastal and ocean monitoring programs through adoption of:

- **Common standards**
- **Common processes/protocols**
- **Middleware for transferring information**

Challenges and Opportunities

Information management in the Southeast has evolved with increasing complexity and numbers of participants:

- Focused, program-specific capabilities were developed for localized observing sites and individual applications, **e.g. Caro-COOPS**
- Capabilities were expanded to include data reporting for larger regions and additional applications, **e.g. Carolinas RCOOS**
- Advanced developments enabled aggregation and presentation of data from multiple programs and partners, **e.g. SECOORA**

The DM infrastructure

Data Sources:

- Observations
- Remote Sensing
- Model Output

Standards



QA/QC

Functions:

- Aggregation
- Analysis
- Visualization
- Prediction
- Assimilation

Delivery
Interfaces

Products:

- Data
- Documentation
- User-defined Tools & Applications

Relationship between data sources, the different ways in which data can be processed or utilized, and types of information products available to users.

Examples

**A sub-regional example:
Carolinas Regional Coastal Ocean
Observing System (Carolinas RCOOS)**

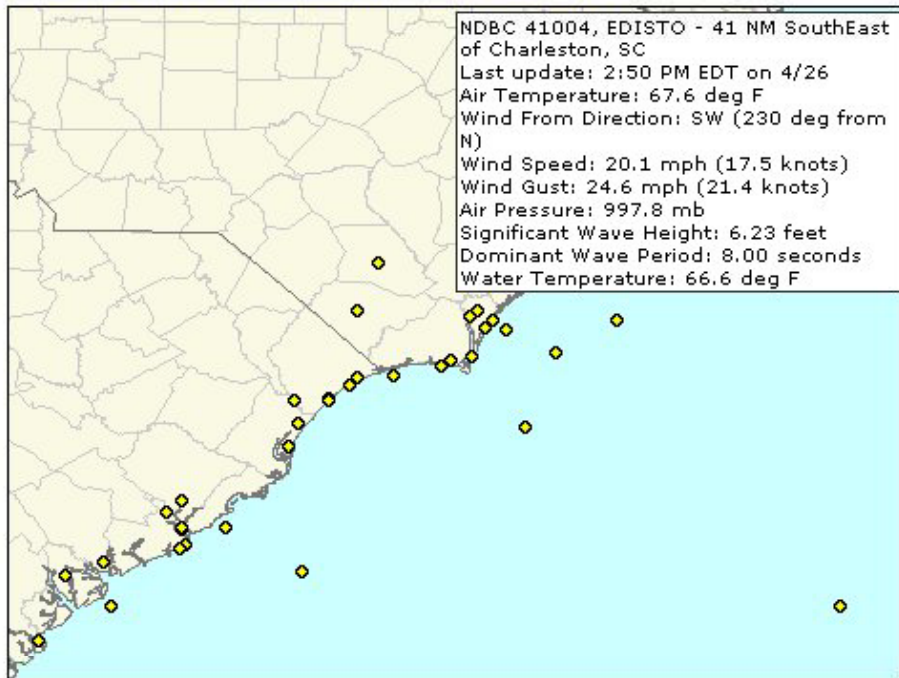


*Increasing our knowledge of the ocean
by observing the coastal Carolinas*



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The Carolinas RCOOS Observation Area



[Click here to submit feedback](#)

What's New
November 14, 2008: Carolinas RCOOS Website launched.
[Mooring Update](#)

Interactive Map





Carolinascroos
Regional Coastal Ocean
Observing System

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Real Time Map

Archive Map

Real Time Layers

- Base Layer
 - NOAA Chart Offshore
 - Google Hybrid
 - Google Terrain
- Map Overlay
 - Bathymetry
 - Latitude/Longitude Grid
- InSitu
 - SC DHEC Rain Gauges
 - Water Quality
 - Real Time Observations
- Recreational
 - Boat Ramps
 - Artificial Reefs
 - NOAA Wrecks and Obstr
- Composite
 - Interpolated Surface Temper
- Web Content
 - Wikipedia

Map



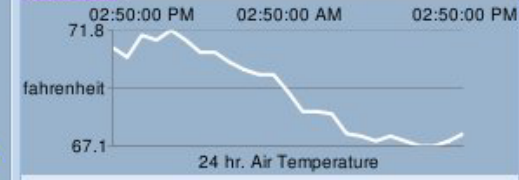
Feature Information

[NDBC 41004, EDISTO - 41 NM SouthEast of Charleston, SC](#)

Surface conditions as of 2:50 PM EDT on 4/26

Air Temperature	67.6 deg F
Wind From Direction	SW (230 deg from N)
Wind Speed	20.1 mph (17.5 knots)
Wind Gust	24.6 mph (21.4 knots)
Air Pressure	997.8 mb
Significant Wave Height	6.23 feet
Dominant Wave Period	8.00 seconds
Water Temperature	66.6 deg F

Data Query



[Permalink](#)

-75.78369, 35.37114

<http://carolinascroos.org/carolinascroos.html#>

[Terms of Use](#)





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Site: CAP2 CHANGE SITES: CaroCOOPs Station CAP2 - Capers Island Nearshore, SC



CaroCOOPs Station CAP2 - Capers Island Nearshore, SC
 Latitude: 32.8 Longitude: -79.62
 Start Operation: 2005-02-11
 Current Status: Operating
[Data Source](#)
[Compare with Other Stations](#)

View Graphics: [Last Day](#) [Last 3 Days](#) [Last Week](#)
 [Last Month](#) [Last Year](#)

Graph and View Data:

Data Type:

Start Date:

End Date:

TimeZone:

Sort Data: For View

Output: Unit:

Last 10 Reports from CAP2 (Left to right: time descending):

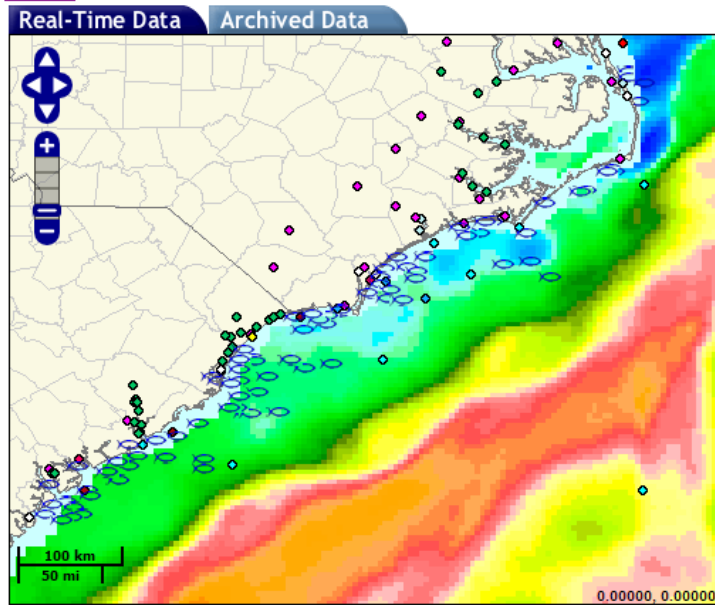
MM-DD-YY HH:MM (EDT)	04-26-10 14:00 PM	04-26-10 13:00 PM	04-26-10 12:00 PM	04-26-10 11:00 AM	04-26-10 10:00 AM	04-26-10 09:00 AM	04-26-10 08:00 AM	04-26-10 07:00 AM	04-26-10 06:00 AM	04-26-10 05:00 AM
Air Temperature (deg F)	70.00	70.30	70.30	70.00	69.40	69.10	68.50	68.40	68.90	68.50
Wind From Direction (deg from N)	214.00	217.00	218.00	245.00	235.00	234.00	248.00	258.00	260.00	236.00
Wind Speed (knots)	17.40	16.00	14.90	14.60	15.90	16.20	16.00	18.40	15.90	18.30
Wind Gust (knots)	21.40	18.40	16.80	18.40	17.70	19.50	18.00	21.10	20.10	20.40
Air Pressure (mb)	996.50	996.90	997.70	998.00	998.60	998.90	998.40	997.50	998.00	998.10
Relative Humidity (percent)	84.00	82.00	81.00	80.00	82.00	78.00	79.00	81.00	89.00	96.00
Water Temperature (deg F)	69.10	69.00	68.90	68.50	68.60	68.20	67.70	67.70	67.80	67.90
Salinity (psu)	33.28	33.32	33.34	33.39	33.26	33.59	33.86	33.80	33.66	33.53
Chlorophyll (ug/L)	56.54	50.69	46.67	45.23	43.23	44.14	39.06	36.47	35.44	34.80
MM-DD-YY HH:MM (UTC)	04-26-10 18:00 PM	04-26-10 17:00 PM	04-26-10 16:00 PM	04-26-10 15:00 PM	04-26-10 14:00 PM	04-26-10 13:00 PM	04-26-10 12:00 PM	04-26-10 11:00 AM	04-26-10 10:00 AM	04-26-10 09:00 AM



Interactive Regional Map

How to use this map:
Click the station to get the most recent data.
The data will appear in the far right panel.

[Permalink](#)



Base Maps and Layers

- [-] Base Maps and layers
 - [-] BaseMap
 - Base Map
 - NOAA Chart Offshore
 - [-] Composite
 - Interpolated Surface Temperature
 - [-] InSitu
 - Bathymetry
 - Real Time Observations
 - In-Situ Winds
 - Latitude/Longitude Grid
 - [-] Locations
 - Coastal Cities
 - [-] Recreational
 - NOAA Wrecks and Obstructions
 - SC Artificial Reefs
 - NC Artificial Reefs
 - SC Boat Ramps
 - NC Boat Ramps



Data Services for Carolinas RCOOS Data

Quick Links

- [Data Query Page](#)
- [DifSOS Page](#)
- [Email Alerts Page](#)

Platform Data Query



The data query page allows the user to select a platform, then choose the measurement and date/time range from which to retrieve data. The user can view/save the data in a columnar format as well as view a timeseries graph of the data.

- [Data Query Page](#)

Dif SOS



The NOAA IOOS [program](#) initiated development of a Data Integration Framework (DIF) to improve management and delivery of an initial subset of ocean observations.

- [Dif SOS Page](#)

Email Alerts



In an effort to push data to users, the Alerts Page allows users to choose a platform and then select one or more measurements (currently either Wind Speed and/or Wave Height) and set a notification limit. If the measurement on the platform goes over the user inputted limit, an email is sent to the user alerting them of the condition. The user can choose from any platform in the RCOOS region of interest. Currently this is an experimental page to gauge user interest.

- [Email Alerts Page](#)

Google

http://twitter.com/sun2RCOOS

Bookmark on Delicious My Delicious Other bookmarks

twitter Have an account? Sign in

Get short, timely messages from SUN2.

Twitter is a rich source of instantly updated information. It's easy to stay updated on an incredibly wide variety of topics. **Join today** and **follow @SUN2RCOOS**.

Get started now > Get updates via SMS by texting **follow SUN2RCOOS** to **40404** in the United States
Codes for other countries

SUN2RCOOS

Name SUN2
Location 33.83, -78.48
Web <http://carocoops.org/>
Bio <http://carolinascroos.org/>
I'm an offshore buoy

7 following 26 followers 2 listed

Tweets 5,585

Favorites

Following

RSS feed of SUN2RCOOS's tweets

Buoy Offshore Weather Air Temperature 69.6F Wind Direction 209.0 Wind Speed 21.3mph Water Temperature 67.3F Sunset , NC
17 minutes ago via API

Buoy Offshore Weather Air Temperature 69.6F Water Temperature 67.3F Wind Speed 21.3mph Wind Direction 209.0 Sunset , NC
about 1 hour ago via API

Buoy Offshore Weather Water Temperature 67.3F Wind Speed 16.3mph Wind Direction 202.0 Air Temperature 69.8F Sunset , NC
about 2 hours ago via API

mwp.ppt NEIEN_schema webina....ppt sccc_presentation_3Co...ppt Show all downloads...

Examples

Example of a federal government-
university partnership:
NWS Southeast Marine Weather Portal

http://129.252.139.110/wx/

Bookmark on Delicious My Delicious



National Weather Service

SE U.S., Gulf of Mexico Marine Portal



Home News Organization Search Enter Search Here Go

Local weather forecast by "City, St" or zip code
City, St

Current Hazards national

Satellite Imagery nationwide

Climate national

Tropical Weather Hurricane Center

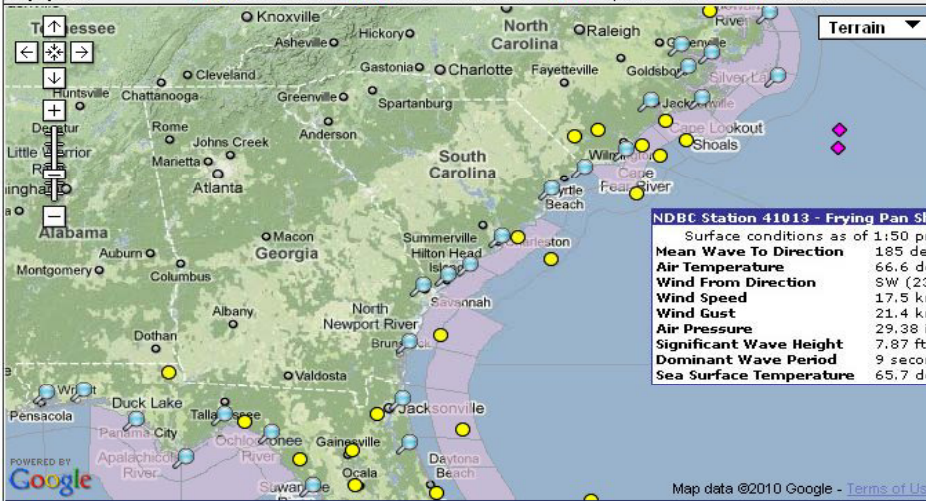
Weather Safety Storm Ready



Click here to learn how to use this map.

Background maps Hazards Winds Wave heights Water temp Radar Marine sites Bathymetry

Pop-up data Observations Observations with WL Ship observations Tide tables



NDBC Station 41013 - Frying Pan Shoals NC
 Surface conditions as of 1:50 pm EDT on 4/26
Mean Wave To Direction 185 deg from N
Air Temperature 66.6 deg F
Wind From Direction SW (230 deg from N)
Wind Speed 17.5 knots (20.1 mph)
Wind Gust 21.4 knots (24.6 mph)
Air Pressure 29.38 inches mercury
Significant Wave Height 7.87 ft
Dominant Wave Period 9 seconds
Sea Surface Temperature 65.7 deg F

English Metric Listen to NOAA weather radio Hazards opacity Radar opacity Wave ht opacity

3 min 52 sec refresh | [Obs KML](#) | [Ship KML](#) | [Tides KML](#) | [Permalink](#)

Special Marine warning Small craft advisory Small craft advisory for winds advisory

Select a term from the list for more information.
Oceanographic and Meteorological get info about... Hazards get info about...

US Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
1325 East West Highway
Silver Spring, MD 20910

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National Weather Service - Since 1870





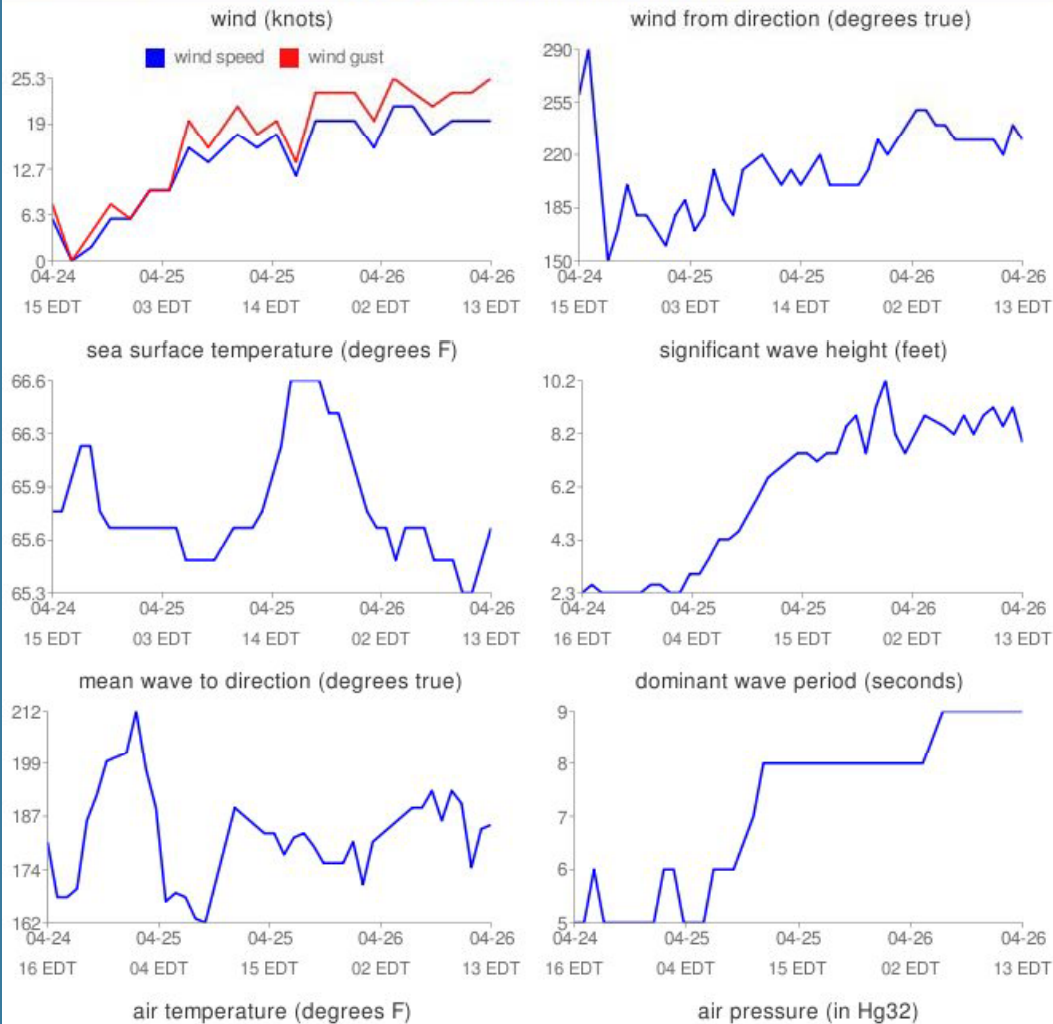
Weather observations for the past two days

www.srh.noaa.gov

NDBC Station 41013 - Frying Pan Shoals NC



[For more site and observation information click here.](#)





Your National Weather Service forecast

11NM ESE Cape Fear Sea Buoy Atlantic Ocean



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NWS Wilmington, NC

[Mobile Weather Information](#) | [Comments/Suggestions](#)

Marine Point Forecast 33.75°N 77.91°W

Last Update: 12:04 pm EDT Apr 26, 2010

Associated Zone Forecast which includes this point

Forecast Valid: 4pm EDT Apr 26, 2010-6pm EDT May 3, 2010

Forecast at a Glance

Tonight	Tuesday	Tuesday Night	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday	Friday Night
SW 21kt 4ft	W 21kt 4ft	W 18kt 3-4ft	NW 19kt↓ 2-3ft	W 12kt 2ft	NW 10kt 2ft	SW 10kt 2ft	↑SSW 15kt 2-3ft	S 15kt 3ft



Small Craft Advisory

Marine Point Forecast *

Hazardous marine condition(s):

Small Craft Advisory
Hazardous Weather Outlook

Synopsis...A COLD FRONT WILL CROSS THE WATERS EARLY TONIGHT. A SERIES OF DISTURBANCES WILL MOVE ACROSS THE CAROLINAS THROUGH TUESDAY. HIGH PRESSURE ALONG THE GULF COAST WILL BUILD INTO THE AREA WEDNESDAY THROUGH FRIDAY.

Tonight: SW wind 17 to 21 kt becoming W after midnight. Scattered sprinkles between 7pm and 9pm. Seas around 4 ft.

Tuesday: W wind 17 to 21 kt. A slight chance of showers after 2pm. Seas around 4 ft.

Tuesday Night: W wind 15 to 18 kt becoming NW after midnight. A slight chance of showers before 2am. Seas 3 to 4 ft.

Wednesday: NW wind 16 to 19 kt decreasing to 11 to 14 kt in the morning. Sunny. Seas 2 to 3 ft.

Select Another Point

[\[Move Down\]](#)

[Click Map for Forecast](#)

[Disclaimer](#)



Lat/Lon: 33.75°N 77.91°W Elevation:0 ft



XML



Outcomes

- Improving understanding of the role of technologies in addressing priority issues
 - Maintained / enhanced infrastructure of additional real-time, continuous observations
 - Improved knowledge of the data that exist to address issues in the region
 - Rapid access to local data for managers, researchers, and the public via multiple channels
-
- Development of inter-agency “rapid response” efforts addressing priority management issues
 - Improved coordination and communication among diverse, complimentary group of coastal entities supporting proactive efforts rather than reactive response

What next

There are many still many coastal and ocean databases largely confined to original purposes. Therefore, we need to:

- **Work towards interoperability for existing databases**
- **Identify optimum database infrastructure options before initiating new monitoring programs**

Critical Participants

- USC: Jeff Jefferson, Susannah King, Payne Seal, Hanna Habashi, Monisha Kanoth, Charlton Purvis
- UNC-Wilmington: Lynn Leonard, Jennifer Dorton, Xiaoyan Qi, Walter Tenney
- UNC-CH: Harvey Seim, Jesse Cleary, Sara Haines, Chris Calloway
- USF: Vembu Subramanian, Jeff Donevan
- U Miami: Ed Kearns, Liz Williams
- SkIO: Trent Moore
- SECOORA: Megan Treml, Sam Walker
- FWRI: Kathleen O'Keife