

# Background:

- Clemson University, South Carolina, 2008 - 2011
- Southeast Climate Consortium (SECC) – *AgroClimate*
- *AgroClimate* covered FL, GA, AL, and NC
- Worked with *AgroClimate* team to include SC

# Outline

- Introduce Southeast Climate Consortium (SECC) Hamid
- SECC Tools - *AgroClimate* Clyde  
Vision, Development , Components, Utility, Demo
- *AgroClimate* Data Requirement Hamid  
South Carolina Example



*Climate Change/Variability*  
*Hotter and Drier*

*'Increase in heat waves very likely (IPCC)'*

*CNN, Nov 18, 2007*

July 16, 2012:

Corn is torched in parts of Illinois  
and many other places due to  
Drought and Heat.



Corn in Farmingdale, Illinois; (AP Photo)

# Nation's Widest Drought in Decades

Worst drought since 1950s

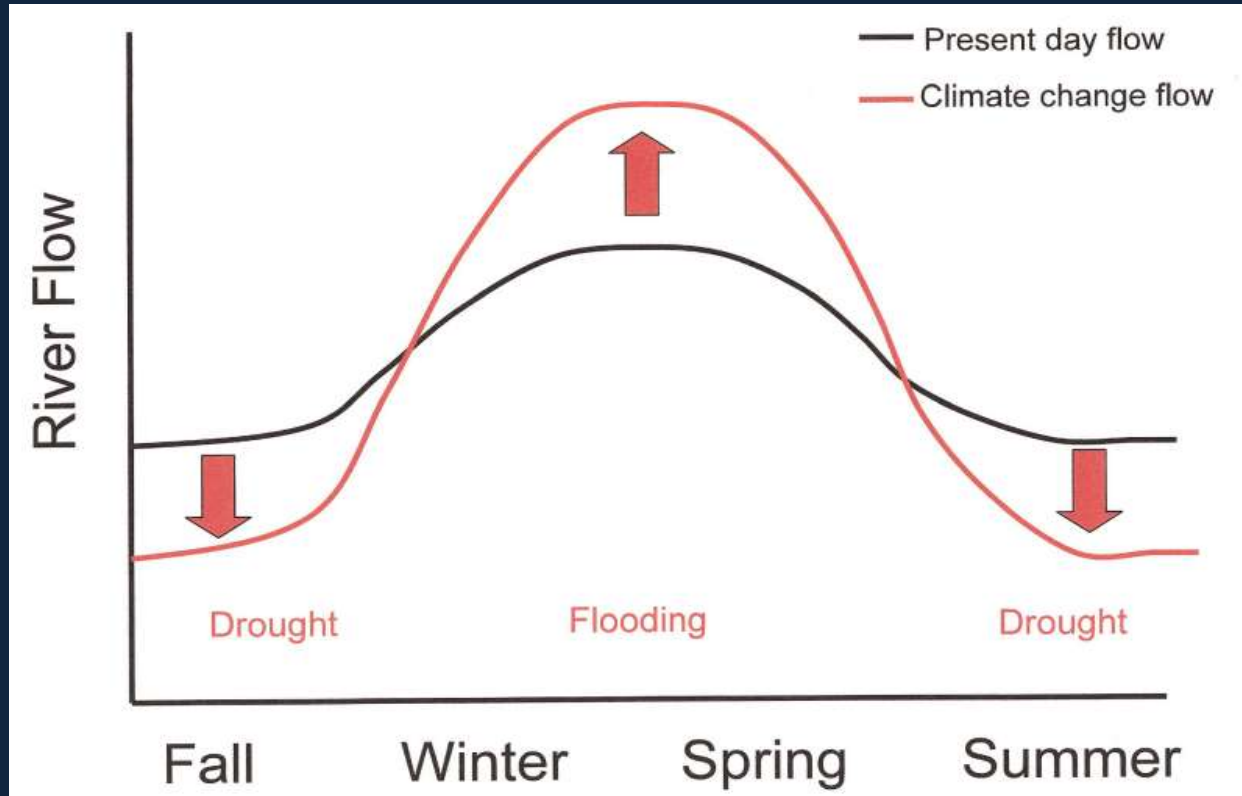
Epicerter: Springfield, Illinois

More than half of the continental U.S. is now in some stage of drought, and most of the rest is abnormally dry.



The screenshot shows a news article from the Chicago Sun-Times. At the top left is the newspaper's logo. To the right, a weather widget displays '97°F Partly Sunny' and 'Good Evening Tuesday, July 17, 2012'. The main headline reads 'Drought worsens as crops weaken in Illinois and much of U.S.' with a sub-headline 'BY EMILY MORRIS Staff Reporter July 16, 2012 7:24PM'. Below the headline are social media sharing buttons for +1, Like, Tweet, and Share. A photograph shows withered, brown corn stalks in a field. A caption below the photo states: 'Corn stalks struggling from lack of rain and a heat wave covering most of the country are seen Monday, July 16, 2012 in Farmingdale, Ill. The nation's widest drought in decades is spreading. More than half of the continental U.S. is now in some stage of drought, and most of the rest is abnormally dry. (AP Photo/Seth Perlman)'. To the right of the photo is an 'Updated: July 17, 2012 2:17AM' timestamp and a text block: 'The ferociously hot, dry summer is killing crops here and across the Midwest, government reports showed Monday. And the forecast calls for more hot, dry weather the next two weeks.' Below this is an 'Ads by Google' section with a headline 'Coming Crude Oil Disaster' and a sub-headline 'The Financial Meltdown Was Big... The Coming Oil Crisis - Even Bigger', with a link to 'MoneyMorning.com/Crude Oil Crisis'. At the bottom left, there is an 'ARTICLE EXTRAS' section with a small image and a 'View Gallery' button. At the bottom right, a text block states: 'All of Illinois and more than half of the continental United States now faces drought conditions, according to information released Monday by the National Climatic Data Center. The percentage of land affected is the largest'.

# Potential Stream Flow Variations



- Lower flows (or more droughts) in summer and fall.
- Higher flows (or more floods) in winter and spring.

- Climate responds to natural phenomena as well as human activities.
- The resulting climate change and variability alter rainfall and temperature with varying risks to crops, livestock, and livelihoods.
- Dominant risks are floods, drought, and heat and cold stress.
- The Southeast Climate Consortium (SECC) helps producers and extension personnel to better understand climate variability and its impact on agriculture.



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## Welcome to The Southeast Climate Consortium

[Features](#)



[News & Updates](#)

[Meeting Announcements](#)

[Recent Publications](#)

[New Grants](#)

[Features](#)

### **New non-technical sea level rise article by Gary Mitchum**

Gary Mitchum from the University of South Florida has written a new article to explain Sea Level Rise in the Southeast for non-technical audiences. [Click here for more info](#)

### **SECC/AgroClimate: Seasonal Forecast**

[Click here for more info](#)

### **SECC/AgroClimate: Monthly State Climate Summaries**



"Scenes from the 2011 SECC Planning Meeting, held November 2-4 in Tallahassee, FL."



## Mission

To use advances in climate sciences, including improved capabilities to forecast seasonal climate, to provide scientifically sound information and decision support tools for improved management of agricultural, forest, and other ecosystems of the Southeastern USA.



- SECC - Origin in the Florida Climate Consortium (FLC)
- FLC was formed in 1996 by three Florida universities (FSU, UF, UM)
- In 2002, FLC expanded to become SECC
- SECC initiated joint activities among its members in FL and GA
- Additional funding allowed SECC to expand across the Southeast to include AL, NC, and more recently SC



## Members:

Scientific experts in climatology, agriculture, engineering, hydrology, marine and atmospheric sciences, and economics.

## Agricultural Research Theme

- Drought and agricultural water
- Crop modeling and yield forecasting
- Disease, weeds, pest management
- Climate variability (rainfall and temperature)



# SECC Online Extension (Information Delivery) Tools

Water Resources (www.SEWater.org)

**Southeast Water Climate**  
A Service of the Southeast Climate Consortium

Current Climate Phase: La Niña  
La Niña remains strong in the Pacific Ocean.

Welcome to SEWater.org!  
Climate is a major factor in the availability and quality of water. SEWater.org provides the latest climate forecasts and links to a variety of water-related information. These forecasts and information can help those addressing water resources understand and plan for the effects of climate variability in the Southeast.

**News**

- Evaporation Tool (July 05, 2011)
- Mandatory Water Restrictions Come to SW Florida (March 23, 2011)
- Lake Okechobee dikes in danger (March 3, 2011)
- Alabama Power seeks to raise water on Logan Martin Lake (February 28, 2011)
- Georgia water plan focuses on Tennessee (February 24, 2011)
- Georgia water rule lingers on one word (January 5, 2011)
- Changes in Tallahassee staffing plan to manage St. Johns River water supply (January 4, 2011)
- North vs. South—Carolina States settle water dispute without Supreme Court (January 4, 2011)

**Outlooks**

- La Niña weather in Florida should be warm (Jan. 29, 2011 - PDF)
- Monthly Climate Summary (April 4, 2011): for Georgia now available
- Water Resources Outlook (July 28, 2009): El Niño Returns to the Eastern Pacific
- Spring Climate Outlook (April 4, 2011): Big Changes in the Pacific Ocean...
- Climate Phase Forecast (April 4, 2011): La Niña weakens in the Pacific Ocean
- 2010 Hurricane Outlook (May 26, 2010): hurricane forecasts for the Atlantic basin produced by Colorado State University and NOAA

**Other Data Sources**

- Southeast Climate Center
- CoCoRHS Network
- Advanced Hydrologic Prediction Center

**Sponsors:** NOAA, NIFA, RMA

**State Weather Networks:** GAEMN, FAWN

Climate is a major factor in availability and quality of water.

Agriculture (www.agroclimate.org)

**AgroClimate**  
A Service of the Southeast Climate Consortium

Current Climate Phase: La Niña  
La Niña develops as the Pacific Ocean continues a rapid transition.

Welcome to AgroClimate.org!  
Climate is a major factor in the availability and quality of water. SEWater.org provides the latest climate forecasts and links to a variety of water-related information. These forecasts and information can help those addressing water resources understand and plan for the effects of climate variability in the Southeast.

**News**

- Drought conditions expand into west, south Georgia (September 18, 2010 - PDF)
- Single state warmest summer nights ever (September 8, 2010 - PDF)
- La Niña weather pattern expected this fall (September 7, 2010)
- Shaping up your carbon footprint (August 20, 2010)
- Have Anyhans

**Outlooks**

- Monthly Climate Summary for Georgia and North Carolina now available (Oct. 8, 2010)
- SECC Fall Climate Outlook is now available (Sept. 18, 2010)
- SECC Agricultural Outlook (August 30, 2010)
- Climate Phase Update (July 18, 2010): La Niña develops as the Pacific Ocean continues a rapid transition.
- SECC Summer Climate Outlook (May 20, 2010): El Niño is over in the Pacific Ocean
- Climate Phase Forecast (May 19, 2010): Pacific Ocean in transition as El Niño dies out. Neutral conditions have returned.
- SECC Winter Climate Outlook (Nov. 13, 2009): El Niño in charge in the Pacific Ocean
- SECC Agricultural Outlook (Oct. 20, 2009): El Niño May Bring a Wetter Winter and Spring to the Southeast

**Supporting Organizations:** NOAA

**Climate Phase Forecast for Oct-Nov-Dec**

- Neutral (2%)
- La Niña (98%)
- El Niño (0%)

Source: The International Research Institute for Climate and Society

**AgroClimate Español**

AgroClimate Now available in Spanish. Click here to view.

**State Weather Networks:** GAEMN, FAWN

**SECC Consortium Members:** Florida State University, The University of Georgia, UF University of Florida, NIFA, Auburn University, UAHuntsville, The University of Alabama in Huntsville, Miami University, NC State University, Clemson University.

Climate is a major factor in crop & livestock production.

# Climate Information and Decision Support System *AgroClimate*

Dr. Clyde Fraisse

The screenshot displays the AgroClimate website, which is a service of the Southeast Climate Consortium. The page features a navigation menu on the left with categories such as Home, AgroClimate Tools, Forecasts and Outlooks, Monthly Climate Summary, Crops, Fruits, Forestry, Forest & Livestock, Climate and El Niño, Climate Change, Links, and About. A sidebar on the left also includes a 'SUPPORTING ORGANIZATIONS' section with the RMA logo.

The main content area is divided into several sections:

- Latest News:** A list of recent news items, including 'Southern Senators See Farm Bill Imbalance (Fri, Jun 8, 2012)', 'NOAA predicts a near-normal 2012 Atlantic hurricane season (May 24, 2012)', '2012 farm bill passes out of committee, heads to full Senate Concerns (Apr. 27, 2012)', 'Impacts of Planting before Crop Insurance Earliest Planting Date (Mar. 20, 2012)', and 'NCC: Risk management tools critical in future farm policy (Mar. 16, 2012)'. A 'News Archive' link is also present.
- AgroClimate Outlooks:** A section for climate outlooks.
- Current Climate Phase:** A status indicator showing 'Neutral' with a note that the 'Tropical Pacific Ocean returns to neutral conditions'.
- Climate Phase Forecast for Aug-Sep-Oct:** A pie chart showing the probability of different climate phases: Neutral (30%), El Niño (51%), and La Niña (1%).
- AgroClimate Mobile:** A section promoting the mobile application, with the website address [www.agroclimate.org/mobile](http://www.agroclimate.org/mobile).
- AgroClimate Indicators:** Two line graphs showing historical data from 2000 to 2012. The top graph is the 'Multivariate ENSO Index - MEI (index)', and the bottom graph is the 'North Atlantic Oscillation - NAO (index)'. Both graphs show fluctuations over time, with the NAO graph showing a notable positive phase around 2011-2012.
- State Weather Networks:** Logos for GAEMN and FAWN.

A photograph of a woman speaking at a podium is also visible, with the caption 'Open AgroClimate Workshop, May 2011'.

# AgroClimate Tools for South Carolina

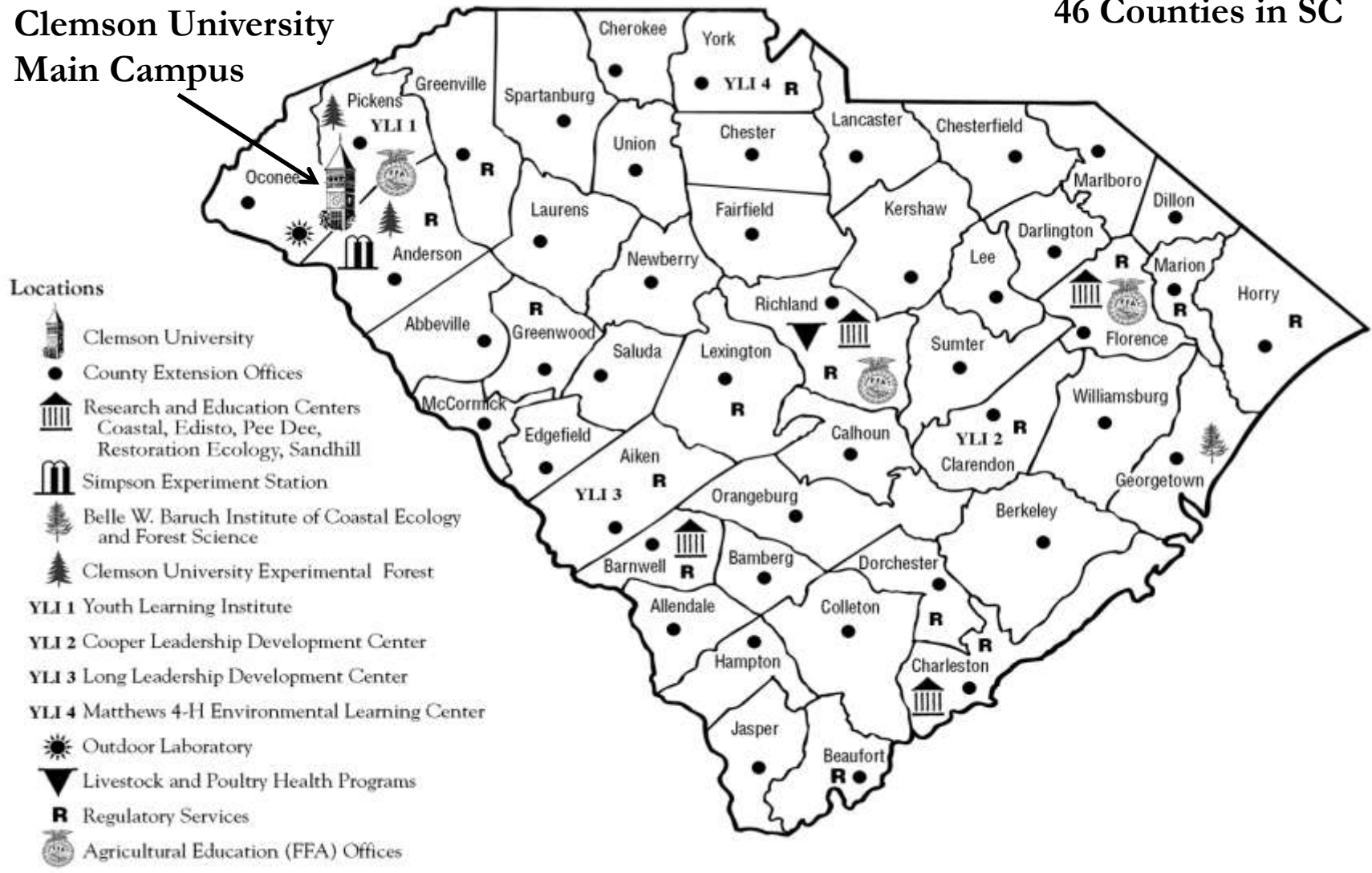
In 2009, Clemson University (CU) cooperated with the AgroClimate team at UF, the State Climate Offices in SC, NC, and FL to prepare data and implement the tools:

- *Climate Risk*
- *County Yield Database*

The screenshot shows the AgroClimate website, a service of the Southeast Climate Consortium. The page features a navigation menu on the left with links to Home, AgroClimate Tools, Forecasts and Outlooks, Monthly Climate Summary, Crops, Fruits, Forestry, Forage & Livestock, Climate and El Niño, Climate Change, Links, and About. A sidebar on the left includes a NOAA logo and a section for Supporting Organizations. The main content area is divided into News and Outlooks sections. The News section contains several articles with dates and PDF links, such as 'Drought conditions expand into west, south Georgia' (September 16, 2010) and 'Georgia sees warmest summer nights ever' (September 8, 2010). The Outlooks section provides monthly climate summaries and outlooks for Georgia and North Carolina. A 'Current Climate Phase' section indicates La Niña, with a pie chart showing Neutral (2%), La Niña (98%), and El Niño (0%). A 'State Weather Networks' section lists GAEMN and FAWN. The footer includes logos for SECC Consortium Members: Florida State University, The University of Georgia, UF, Auburn University, UAHuntsville, NC State University, and Clemson University.

# Clemson University Main Campus

46 Counties in SC



# County Crop Yield Data

- No long-term county level yield data other than those at USDA-NASS.
- NASS data in SC start in 1966 for corn and hay and 1972 for other crops.
- Assembled data for seven major crops of corn, cotton, peanuts, soybeans, winter wheat, rye, and hay.
  
- The NASS data were combined averages of rainfed and irrigated yields.
- Acceptance criterion was a minimum of 20 yrs of data.
- All 46 counties in SC had at least 20 years of corn & soybeans yields.
  
- Thirty five counties had at least 10 years and 25 of them had at least 20 years of yield data for cotton.
- Eleven counties had at least 10 years of yield data for peanuts.

# Climate Data

## (Min and Max Air Temperature and Daily Rainfall)

- A list of Co-Op stations was secured from SC and NC State Climate Offices.
- Compared station-by-station to deduce data availability, gaps, station location, and if a station was still operational or discontinued.
- Out of 190 Co-Ops, 46 quality stations (one per county) were selected.

The criteria to eliminate stations were as follows:

- Station must have a minimum of 20, and preferably 50, years of data.
- Station must be operational today.
- Station must provide min. and max. temperature and rainfall per day.
- Stations with the highest data availability (and lowest gaps) will have priority.
- Physical location of the Co-Op must represent agricultural setting.

### Weather Data Networks

- ASOS
- AWOS
- ECONet
- COOP
- RAWS
- USCRN
- Buoy

### Current Conditions

- Temperature (F)
- Heat index (F)
- Soil Temperature (F)
- Dewpoint (F)
- Windbarbs

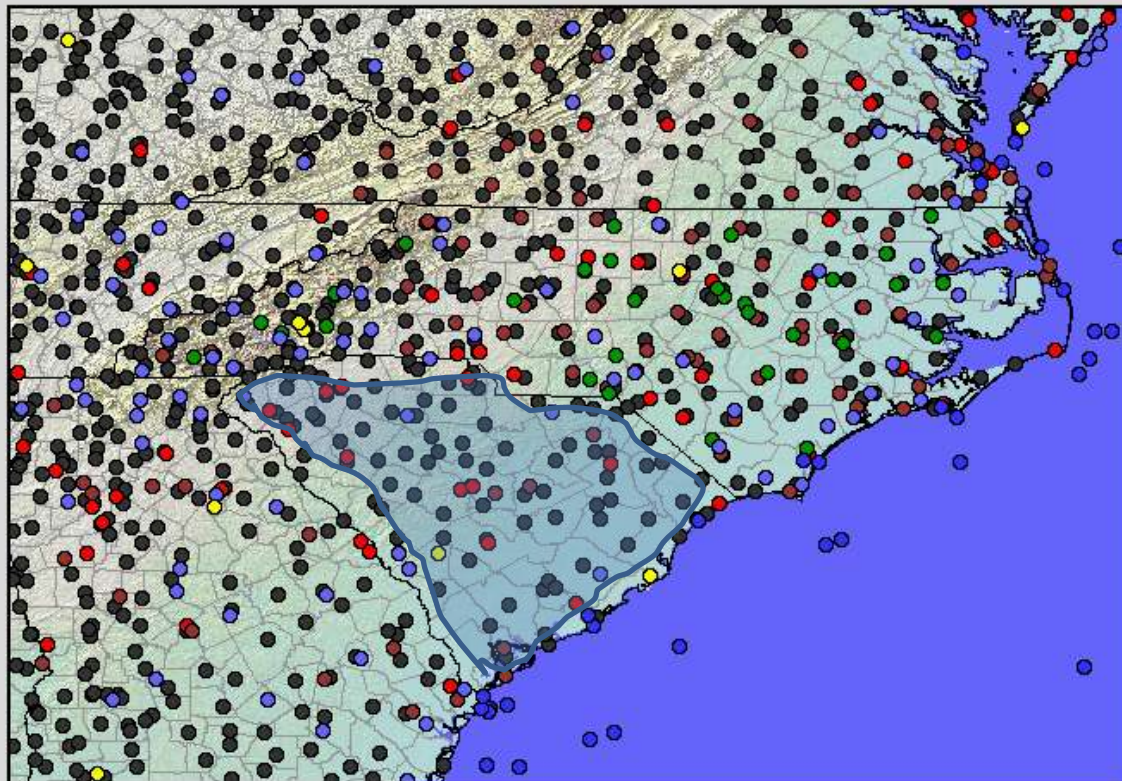
### Radar Imagery

- Regional Mosaic

### Geographic

- County lines
- Cities
- Rivers and Streams

redraw map Information recenter zoom in zoom out full extent



### Legend:

- USCRN
- RAWS
- ECONet
- Buoy
- AWOS
- ASOS
- COOP
- County Lines

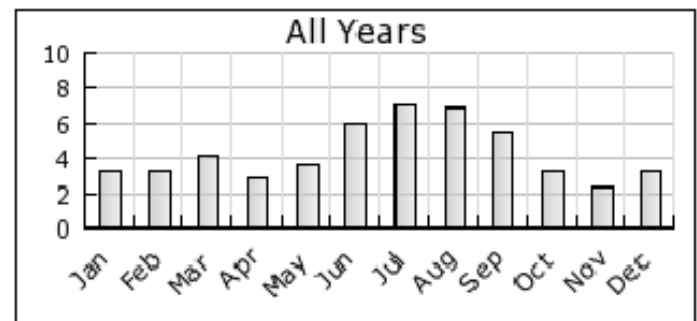
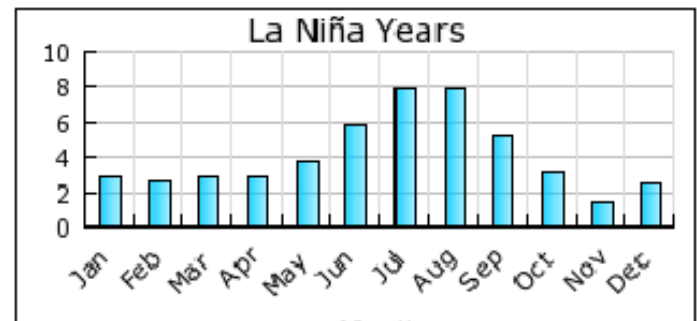
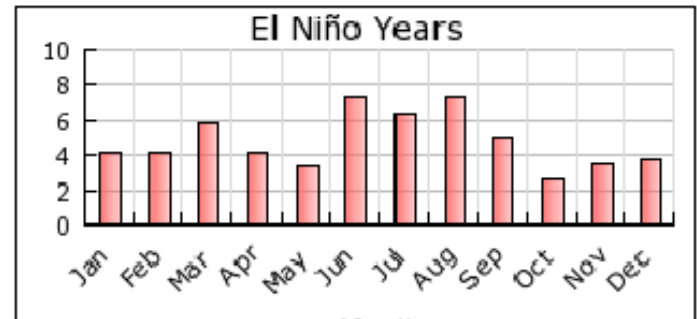
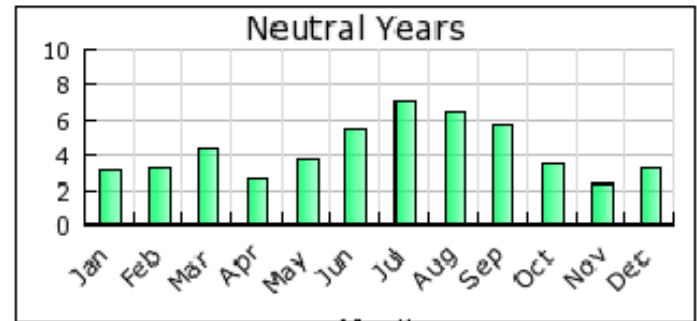
State Climate Office of North Carolina NC CRONOS Database °N °W

Map is currently showing current conditions. [Click to show past](#) and then redraw map.

Error on page.

# Charleston, SC

All Years	51.4 inch (0)
Neutral	50.8 inch (-0.6)
El Niño	57.4 inch (+6.0)
La Niña	48.9 inch (+2.5)



# Summary

- Conducted *AgroClimate* Hands-on Workshops
- Wish to explore the possibility of cooperation between SECC/*AgroClimate* Team and NRCS to expand *AgroClimate* to other states and also adding more tools that may be of mutual interest

# Sea Level Rise – How much?

Science Panel:  
Surest prediction of all is  
one meter (39 inch) rise  
along NC by 2100.

NC Coastal Resources  
Commission:  
Not so fast, we think 8  
inches, or up to 15 inches.

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## Coastal N.C. counties fighting sea-level rise prediction

Science panel predicts 1-meter sea-level rise by 2100, counties say that could harm economic development

Recommend 450 recommendations. Sign Up to see what your friends recommend.

By Bruce Henderson  
bhenderson@charlotteobserver.com

Posted: Monday, May 28, 2012

State lawmakers are considering a measure that would limit how North Carolina prepares for sea-level rise, which many scientists consider one of the surest results of climate change.

Federal authorities say the North Carolina coast is vulnerable because of its low, flat land and thin fringe of barrier islands. A state-appointed science panel has reported that a 1-meter rise is likely by 2100.

The calculation, prepared for the N.C. Coastal Resources Commission, was intended to help the state plan for rising water that could threaten 2,000 square miles. Critics say it could thwart economic development on just as large a scale.

**MORE INFORMATION**

- Interactive: Sea levels rising on Carolina coast

**DISAGREEMENT OVER STUDY**

A state-appointed science advisory panel reported in 2010 that sea level along the North Carolina coast is likely to rise 1 meter by 2100. An economic development group, however, argues that the science is flawed. An 8-inch rise is more likely, it says.

**SEA-LEVEL RISE PAST AND FUTURE**

According to tide gauges, sea level rose an average of 1.7mm a year during the 20th century, NASA says. Satellites, which are considered more accurate, show a rate of 3.17mm a year since 1993. The International Panel on Climate Change in 2007 projected a rise of 18 to

Charlotte observer, May 2012

# Thank you

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