

National Weather Service Greenville-Spartanburg, Forecast Office



***CoCoRaHS Presentation: NC CERT
Conference May, 2017***

Introduction- who we are.....

Federal Agency Within the U.S. Dept. of Commerce



Introduction- who we are.....



Introduction- who we are.....



**122 NWS
forecast offices**

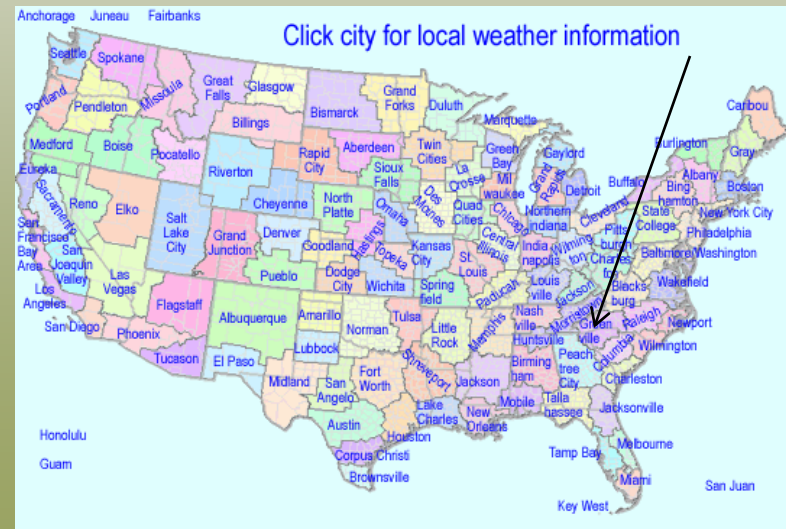




**122 NWS
forecast offices**



NWS Greenville-Spartanburg



& what we do.....

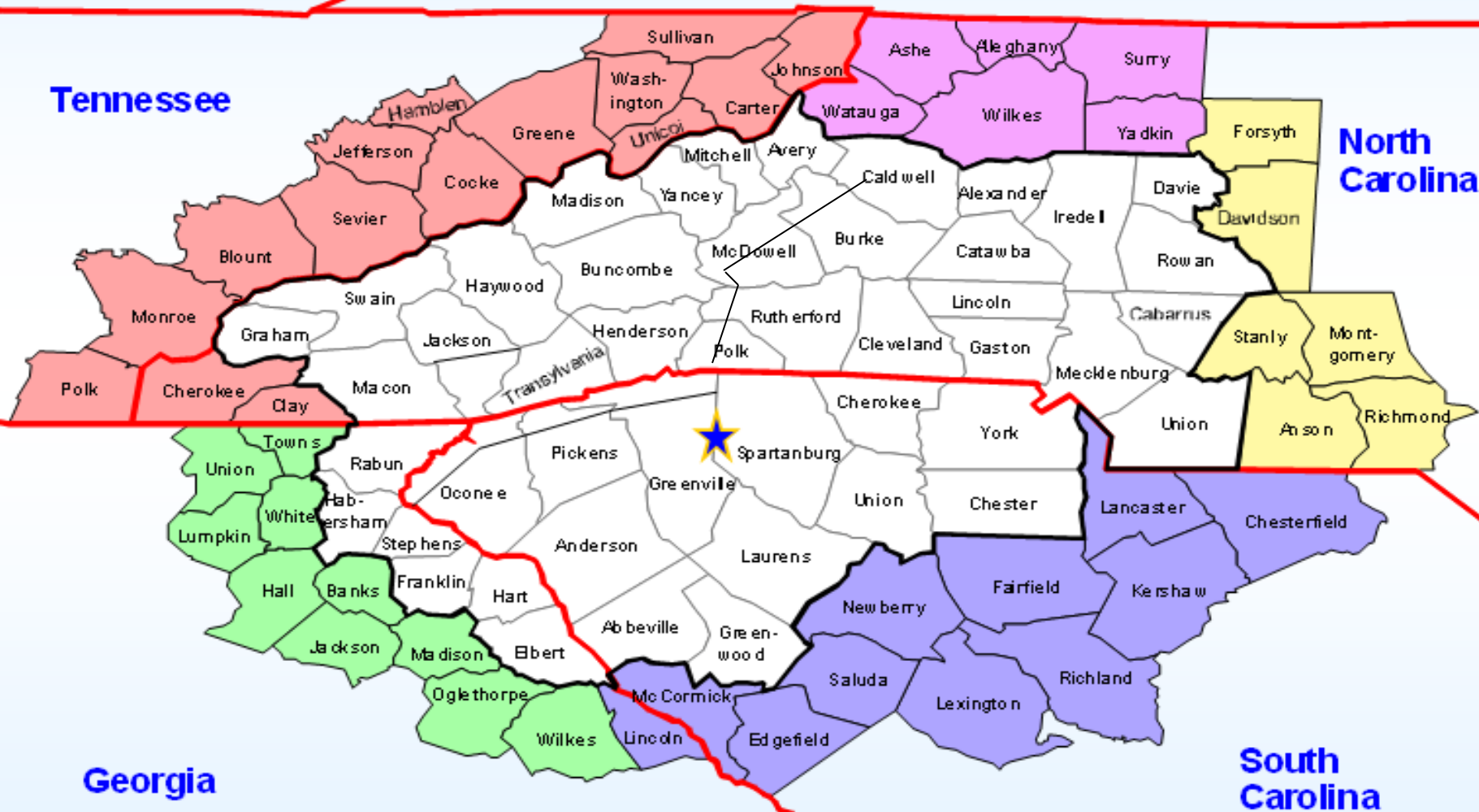


National Weather Service Mission Statement:

"The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community."



WFO Greenville-Spartanburg Area of Responsibility



46 Counties, 55 Zones, 3 States

Primary Cities Served



Asheville



Greenville

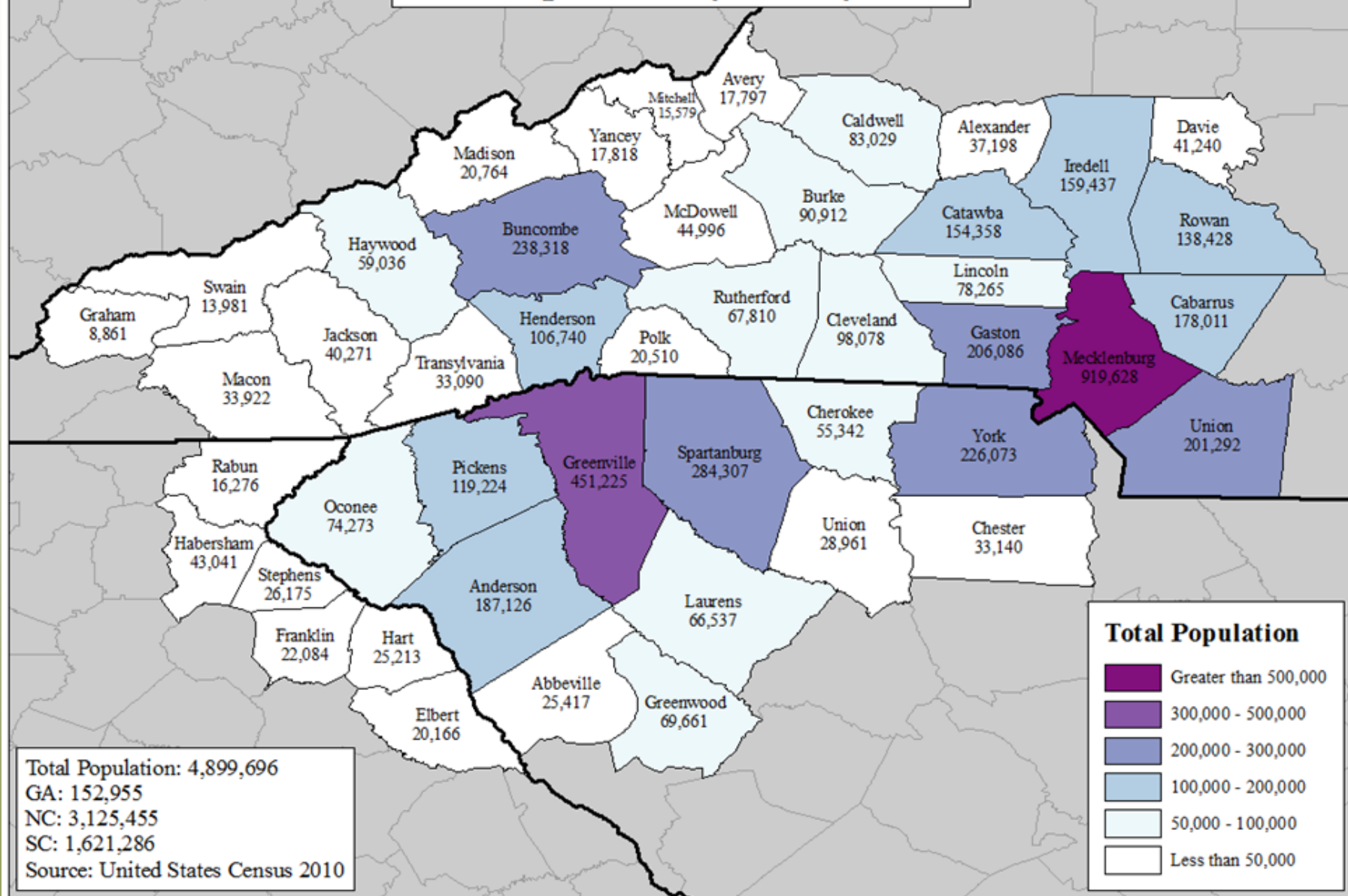


Charlotte

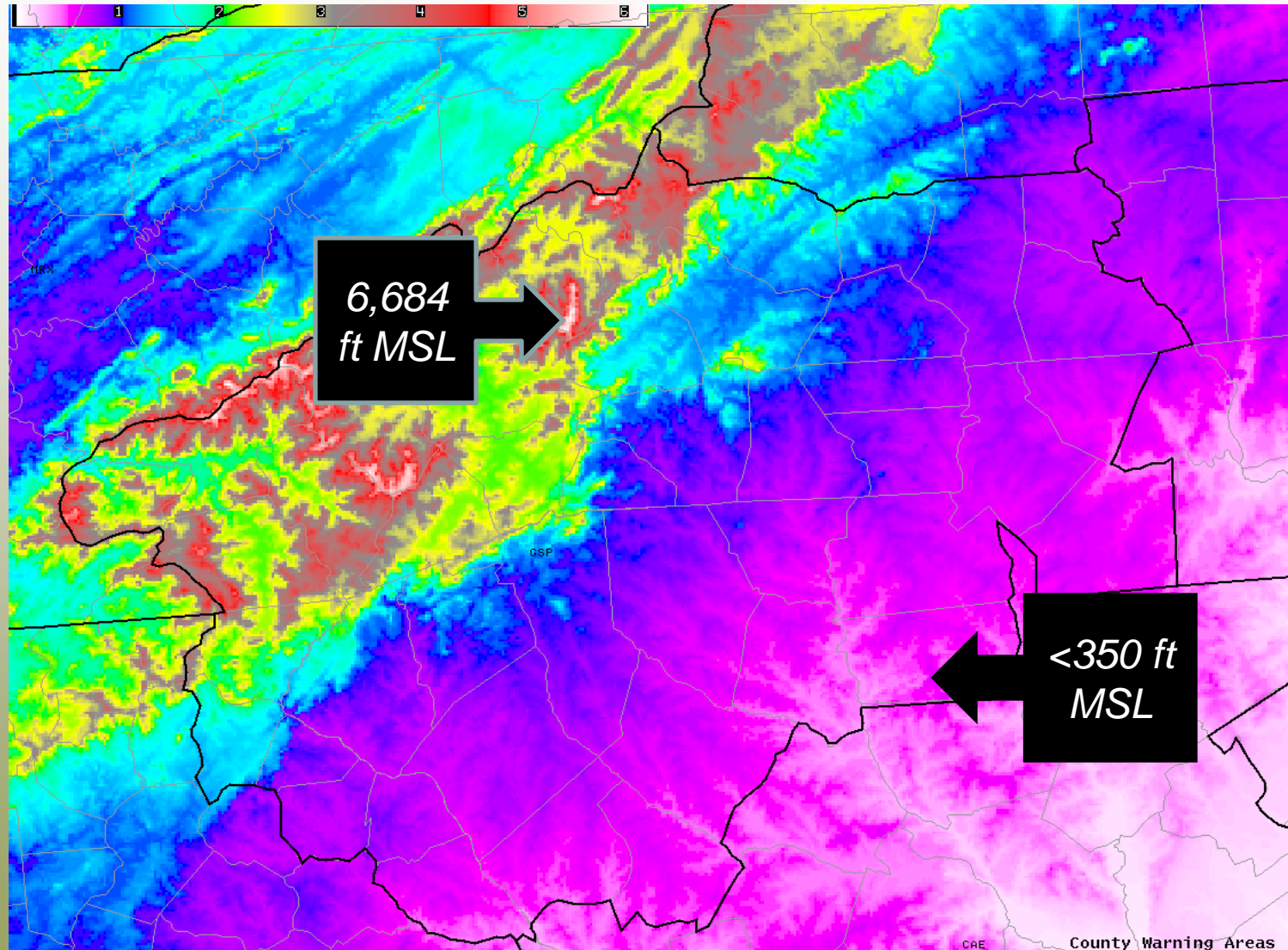


Spartanburg

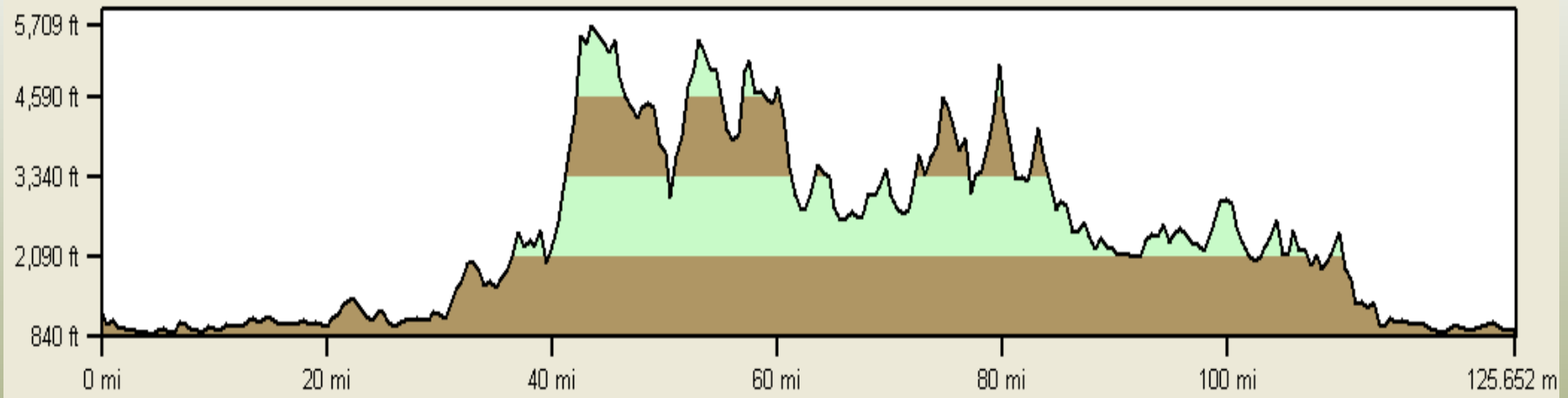
NWS Greenville-Spartanburg, SC Population by County



Topography of our Forecast Area.....



Terrain Cross-Section Northwest-Southeast Across the Mts



East TN

WNC

Upstate SC

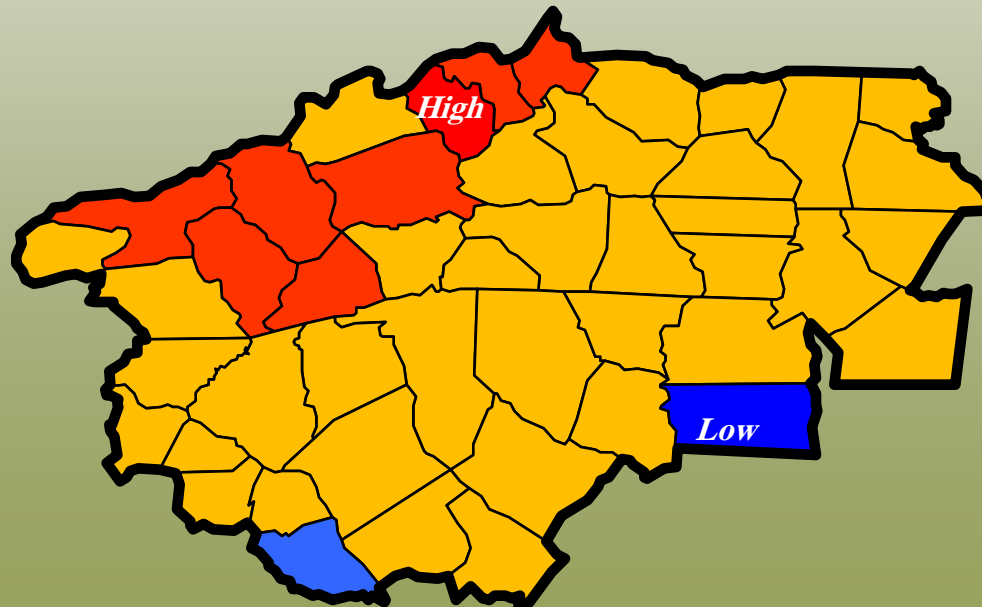
GSP County Warning Area Facts

*Greatest Range in Terrain Elevation
of any CWA East of the Mississippi*

Highest = 6,684 feet - Mt. Mitchell, NC

Lowest = 270 feet - Chester County, SC

Difference = 6,414 feet



**8 COUNTIES WITH
TOTAL OF 55
PEAKS > 6,000 ft.**

GSP County Warning Area Facts

Highest Terrain in the Eastern United States

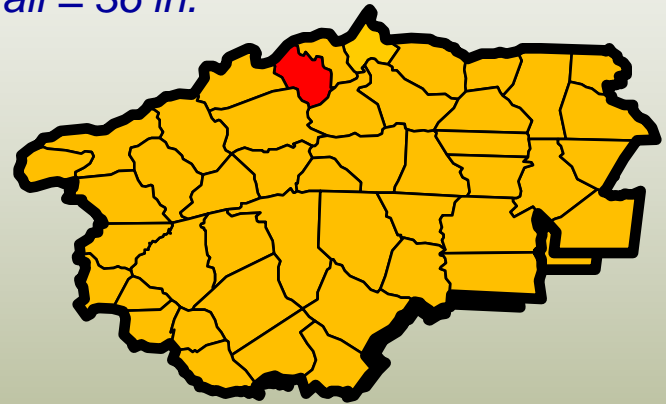
Mt. Mitchell, NC - 6,684 ft.

NC Record Low Temp. = -34°F

Greatest 24 hr Snowfall = 36 in.



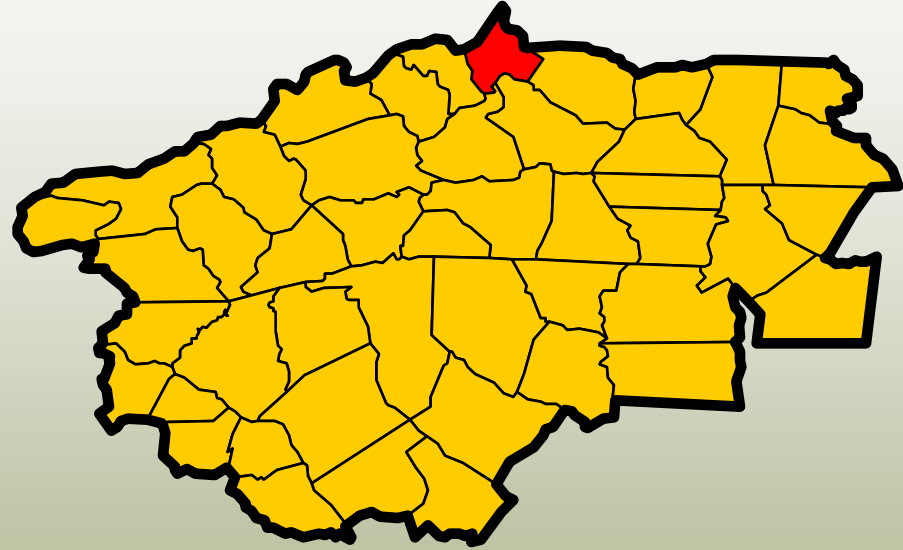
View from the summit of Mt. Mitchell



GSP County Warning Area Facts

Highest Incorporated Town in the Eastern U.S.

Beech Mountain (Avery County, NC) - 5,506 ft



Average Annual Snowfall ~ 85 inches

1995-1996 Snowfall = 128 inches

***Beech Mountain from Pinnacle
Ridge (5506 ft)***



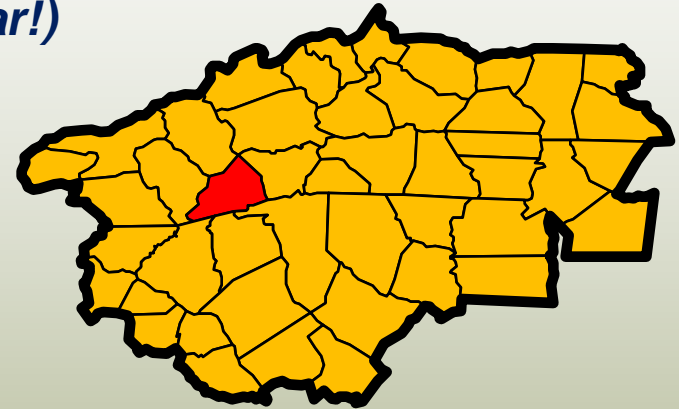
GSP County Warning Area Facts

Record Annual Station Precipitation (east of the Rockies)

146 inches - Lake Toxaway, NC (2004/2005)

(More than 12 feet of precip in one year!)

Transylvania County



French Broad River



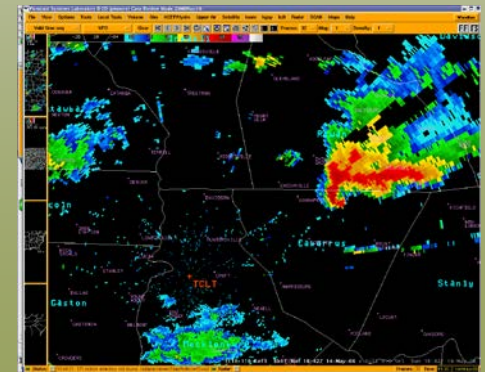
Upper Whitewater Falls



Looking Glass Rock

Year-round Weather Hazards

- **Severe Convective Storms**
 - Tornadoes
 - Any month, but infrequent during winter
 - Damaging Wind
 - Any month, but most frequent in June and July
 - Large Hail
 - Very rare during fall and winter



SKYWARN Storm Spotters

SKYWARN® spotters - provide essential information for all types of weather hazards, the main responsibility of a spotter is to identify and describe severe local storms. The information provided by SKYWARN® spotters, coupled with Doppler radar technology, improved satellite and other data, has enabled NWS to issue more timely and accurate warnings for tornadoes, severe thunderstorms and flash floods.



Reporting Criteria

Hail – of any size, especially quarter-size or larger

Wind – recorded gusts of 58 mph or greater
Any damage caused by wind

Flooding – where it doesn't normally occur

Tornadoes, funnel clouds, rotation in a storm

Not Reported:

Lightning, heavy rain, scud clouds

How to Report Severe Weather

- Directly to the NWS Severe Wx Hotline: 1(800) 268-7785
- To your local Emergency Manager or 911 center
 - Try calling your county's non-emergency phone number first
 - If not available, Dial 911 and make your report

What to include in your report:

- **Your location**: *County, miles and direction from a town or city, road intersection, etc...*
- **Time of event**: *When did the event occur or end?*
- **Actual event**: *What you observed, without exaggerating!*

Official Spotter Training

Online spotter training is available at:

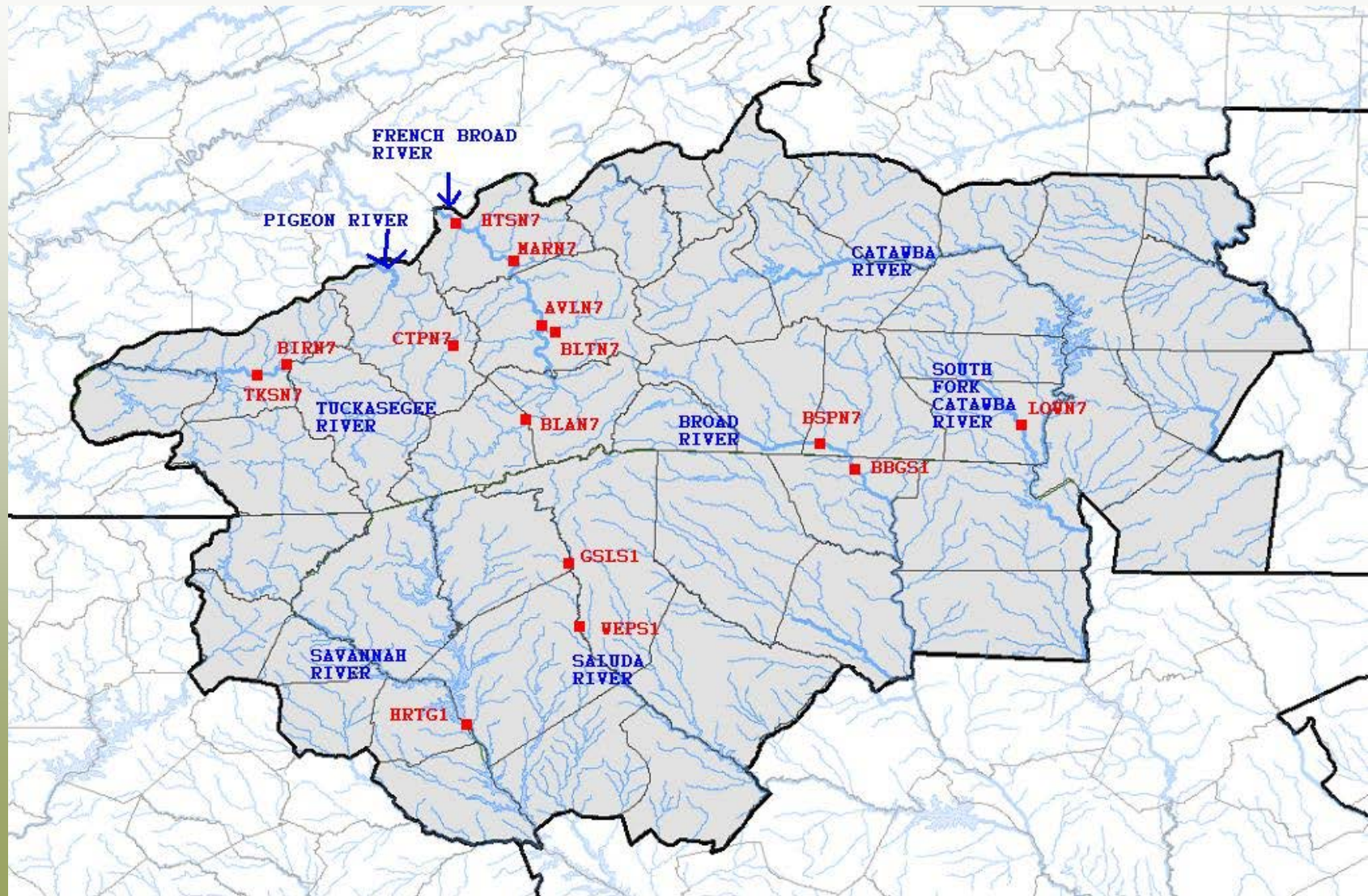
https://www.meted.ucar.edu/training_course.php?id=23

(You will need to create an account on the COMET website in order to access the training material.)



Hydrology

Main Rivers and River Forecast Points



Cooperative Observer Program



Cooperative Observer Program

The Cooperative Observer Program was formally created in 1890 under the Organic Act. Its mission is two-fold:

1: To provide observational meteorological data, usually consisting of daily maximum and minimum temperatures, snowfall, and 24-hour precipitation totals, required to define the climate of the United States and to help measure long-term climate changes

2: To provide observational meteorological data in near real-time to support forecast, warning and other public service programs of the NWS.

Cooperative Observer Program

Coop observational data supports the NWS climate program and field operations.

The program responsibilities include (typically managed by the local NWS Observing Program Leader (OPL)):

- *Selecting data sites*
- *Recruiting, appointing, and training of observers*
 - *Installing and maintaining equipment*
 - *Keeping station documentation*
- *Collecting data and its delivering it to users*
 - *Maintaining data quality control*
- *Managing fiscal and human resources required to accomplish program objectives*

Cooperative Observer Program

*Nationwide network of around 10,000 volunteer observers and institutions.
Some stations are more than 100 years old.*

The majority report daily temperature and precipitation.



*Fisher & Porter
Automated
Raingauge*



*MOM75
Max & Min
Thermometer*

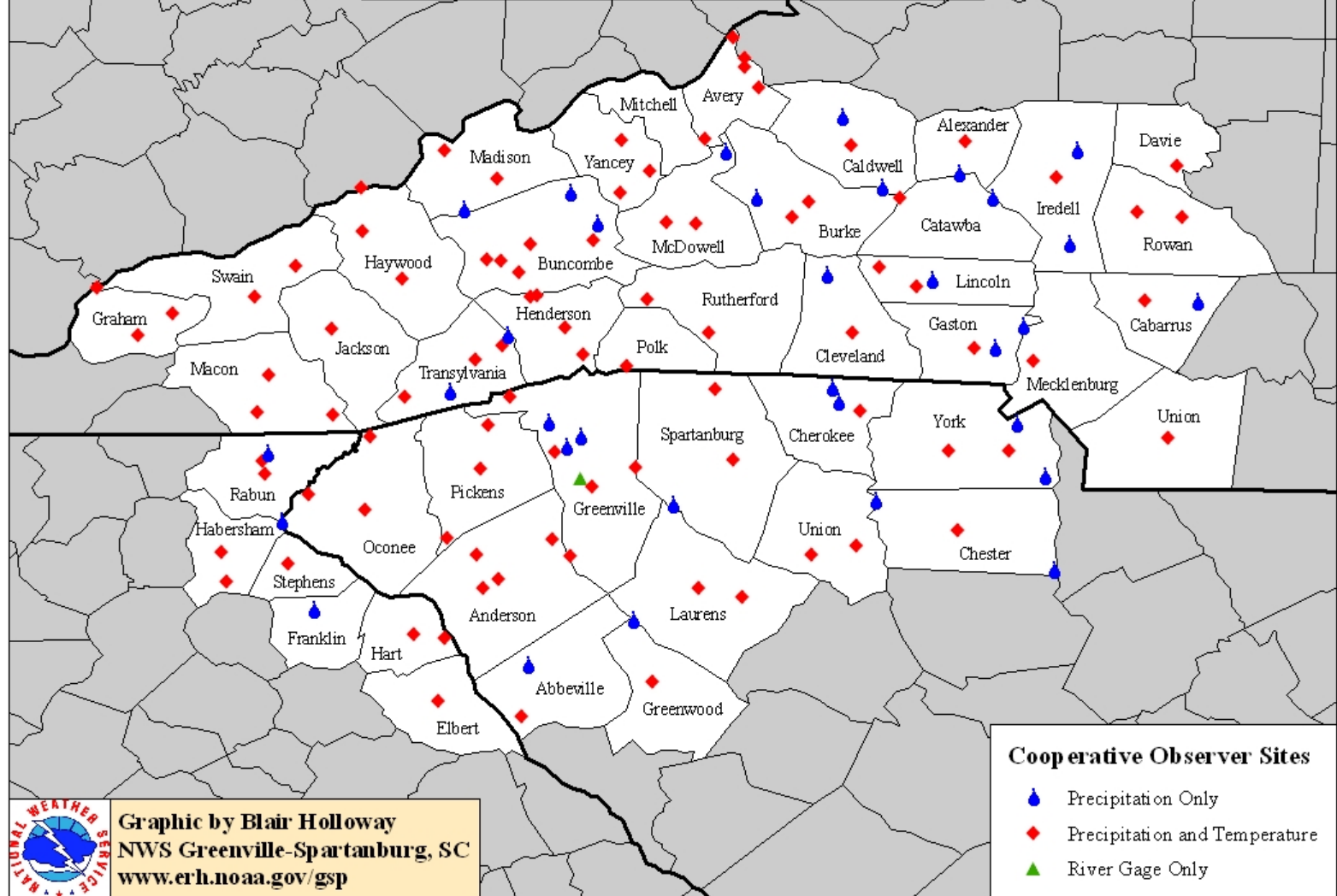


8\"



*Cotton Region
Shelter*

NWS Greenville-Spartanburg, SC Cooperative Observer Sites



115 Active Cooperative Observers

Aren't there enough rain gauges?

- *NWS ASOS and AWOS (approximately 950 nationwide)*
- *The NWS COOP observer program*
 - *At one time there were over 12k in the NWS...now about 10k.*
- *The USGS river and rain gauge networks*
 - *Was expanding but cutbacks have reduced further development*
- *Private mesonets*
 - *TV stations and State Climate Offices*



No, there aren't enough rain gauges!!!



CoCoRaHS – Engaging the nation with 19,000+ volunteers measuring daily backyard precipitation



Photo: Steve Kamp

CoCoRaHS was born in response to the 1997 Fort Collins, Colorado Flood



STORM TOLL

Deaths - 5 confirmed
Injuries - 40
Missing - 16
Rescued - 160

Damages - Tens of millions of dollars at Colorado State University, \$1.5 million to \$2 million to city roads and bridges; \$1 million to city parks and trails; no estimate for private property.

Source: Emergency Officials
All information as of 1 a.m. today

Wednesday



July 30th 1997



Volunteers of all ages and backgrounds



Observers are trained and take daily measurements of precipitation in their backyards

Simple, low-cost measurement tools



*4-inch diameter
High capacity rain gauges*



*Aluminum foil-wrapped
Styrofoam hail pads*



*Snow rulers marked
in tenths of an inch*

Just precipitation



Rain



Hail



Snow

Accurate measurements resulting in high quality data

Volunteers report their daily observations on our interactive Web site: www.cocorahs.org

My Data Entry : Daily Precipitation Report Form

Precipitation Report FormSubmit DataReset

Station Number : CO-LR-610

Station Name : Fort Collins 3.5 SW

☐ * Denotes Required Field

***Observation Date**

***Observation Time**

***Total Rain and Melted Snow in gauge in inches to the nearest hundredth**

☒ Yes ☐ No **Report was taken at registered location?**

Observation Notes: (This will be available to the public)

New Snow


Depth of new snow in inches to the nearest tenth

Melted value from core to the nearest hundredth

Total Snow on Ground

Depth of total snow in inches to the nearest half inch

Melted value from core to the nearest hundredth

**COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK**
"Because every drop counts"

[Home](#) | [States](#) | [View Data](#) | [Maps](#) | [My Data](#) | [My Account](#) | [Admin](#) | [Logout](#)

Welcome to CoCoRaHS! "Volunteers working together to measure precipitation across the nation."

Main Menu

- Home
- About Us
- Join CoCoRaHS
- Contact Us
- Donate

Resources

- FAQ / Help
- Education
- Training Slide-Shows
- Videos
- Drought Impacts
- Evapotranspiration
- Volunteer Coordinators
- Hail Pad
- Distribution/Drop-off
- Help Needed
- Printable Forms
- The Catch
- Message of the Day
- Data Analysis
- CoCoRaHS Blog
- Web Groups
- State Newsletters
- Master Gardener Guide
- March Madness Contest
- State Climate Series
- WxTalk Webinars
- Sponsors
- Links
- CoCoRaHS Store

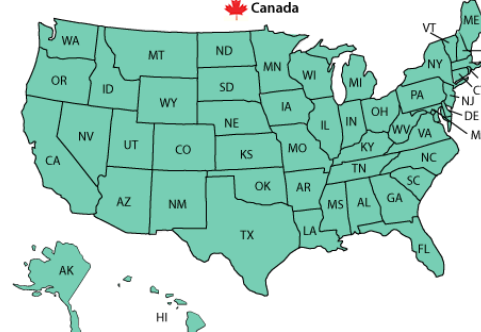
CoCoRaHS WxTalk Webinar Series

7,932 daily precipitation reports received today as of 8/26/2013 5:23 PM EDT




Daily Precipitation (inches x.xx) USA 8/26/2013



0.0
Trace
0.00 - 0.22
0.23 - 0.44
0.45 - 1.10
1.11 - 2.64
2.65 - 3.96
3.97 - 4.40



JOIN CoCoRaHS

**TRAINING SLIDE-SHOWS**

Things to know about...

-  **Rain**
-  **Hail**
-  **Snow**


CoCoRaHS WxTalk Webinar Series

Purchase an official CoCoRaHS 4" Rain Gauge

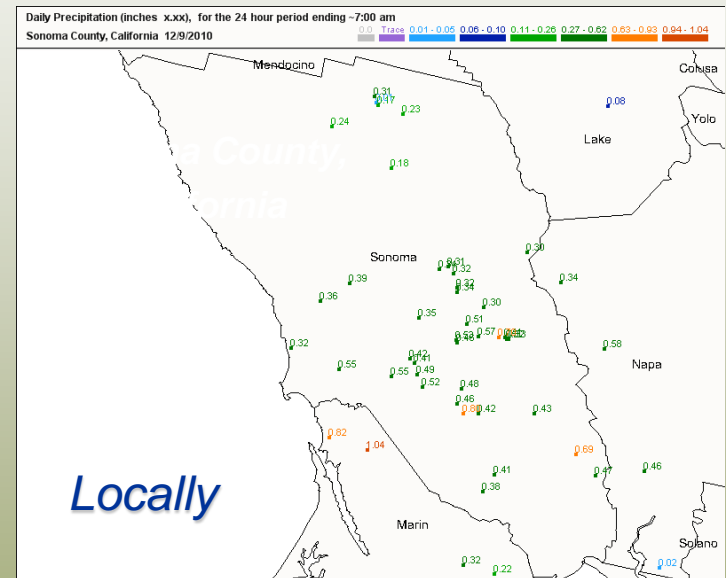
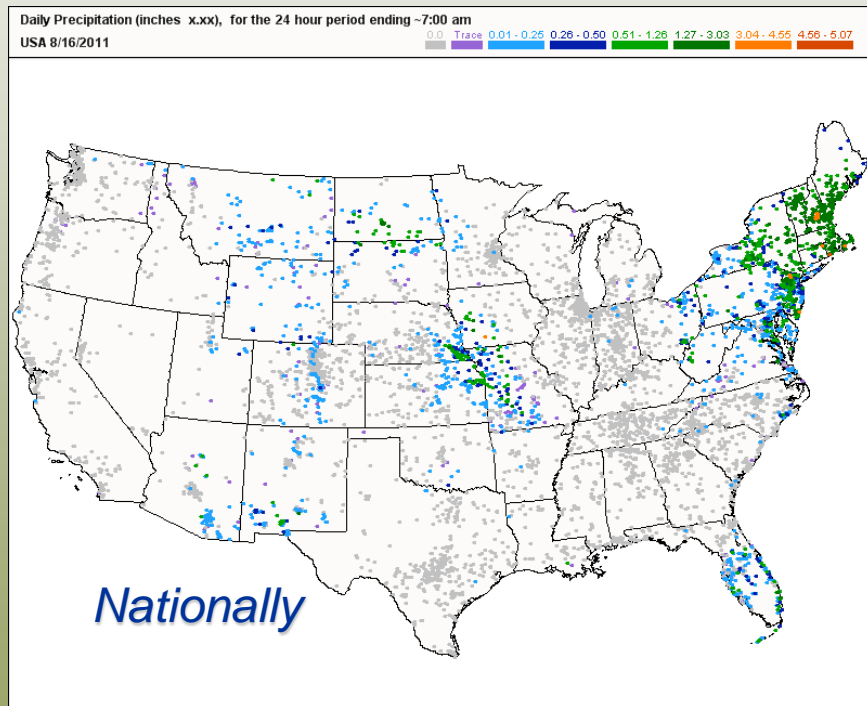
"The official CoCoRaHS Rain Gauge supplier"

WEATHERYOURWAY.COM

Fast, Friendly service from a meteorologist and fellow CoCoRaHS Observer



Date	Time	Station Number	Station Name	Total Precip .ins	New Snow .in	Total Snow .in	State	County	View
12/9/2010	7:00 AM	CA-SN-71	Rohnert Park 0.9 SW	0.80	NA	NA	CA	Sonoma	
12/9/2010	7:00 AM	CA-SN-87	Santa Rosa 2.0 NE	0.70	NA	NA	CA	Sonoma	
12/9/2010	7:15 AM	CA-SN-84	Sonoma 1.9 NNW	0.69	NA	NA	CA	Sonoma	
12/9/2010	6:00 AM	CA-SN-61	Santa Rosa 1.3 NW	0.57	NA	NA	CA	Sonoma	
12/9/2010	7:10 AM	CA-SN-46	Sebastopol 3.0 SW	0.55	NA	NA	CA	Sonoma	
12/9/2010	8:00 AM	CA-SN-88	Occidental 2.8 SW	0.55	NA	NA	CA	Sonoma	
12/9/2010	8:00 AM	CA-SN-31	Sebastopol 2.6 SSE	0.52	NA	NA	CA	Sonoma	
12/9/2010	7:00 AM	CA-SN-28	Santa Rosa 3.1 NW	0.51	NA	NA	CA	Sonoma	
12/9/2010	7:00 AM	CA-SN-49	Sebastopol 1.1 SSE	0.49	NA	NA	CA	Sonoma	



Volunteer's observations are immediately available in map and table form for the public to view.

Rainfall Data



CoCoRaHS has quickly become the largest source of daily precipitation measurements in the United States

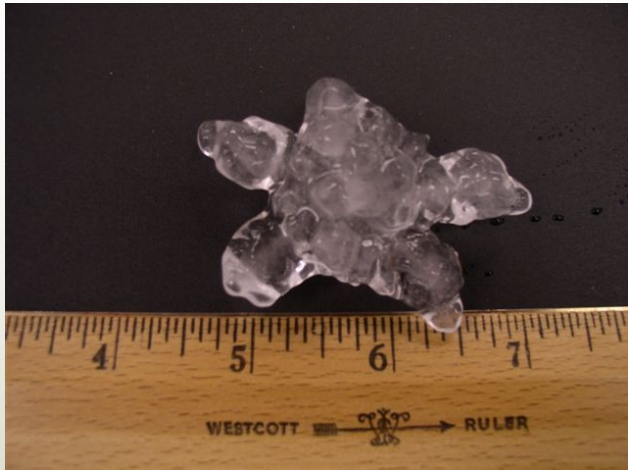
Snow Data

CoCoRaHS



CoCoRaHS Volunteers measure both snowfall depth (new and accumulated), as well as the water content of the snow (SWE)

Hail Data



CoCoRaHS has become one of the largest repositories of hail data in the United States

CoCoRaHS data is used by many:

- National Weather Service
- Other Meteorologists
- Hydrologists
- Emergency Managers
- City Utilities
 - Water supply
 - Water conservation
 - Storm water
- Insurance adjusters
- USDA—Crop production
- Engineers
- Scientists studying storms
- Mosquito control
- Farm Service Agency
- Ranchers and Farmers
- Outdoor & Recreation
- Teachers and Students
 - Geoscience education tool
 - Taking measurements
 - Analyzing data
 - Organizing results
 - Conducting research
 - Helping the community



Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

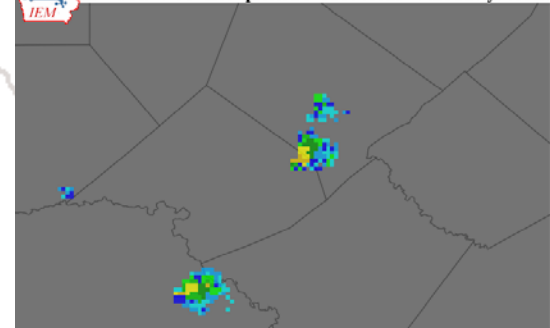
Comal County, Texas 5/6/2008

0.0 Trace 0.01 - 0.36 0.37 - 0.72 0.73 - 1.79 1.80 - 4.28 4.29 - 6.42 6.43 - 7.12

“A great example of one observation making a difference:”

7.12" May 6, 2008: New Braunfels, Texas

IEM NEXRAD composite base reflect valid: 05 May 2008 0

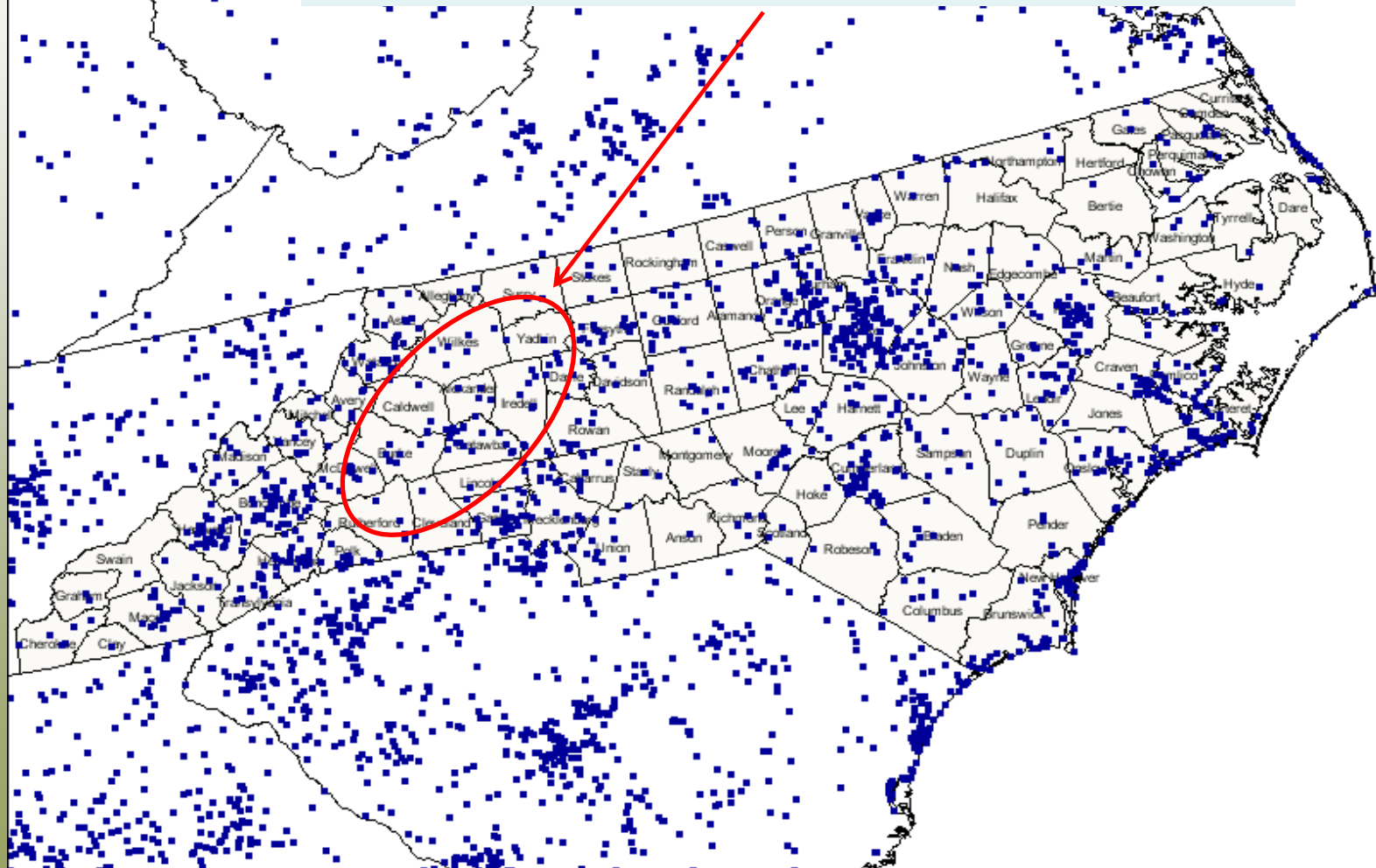


“All but .02 fell between 3:30 and 5:30 pm.”

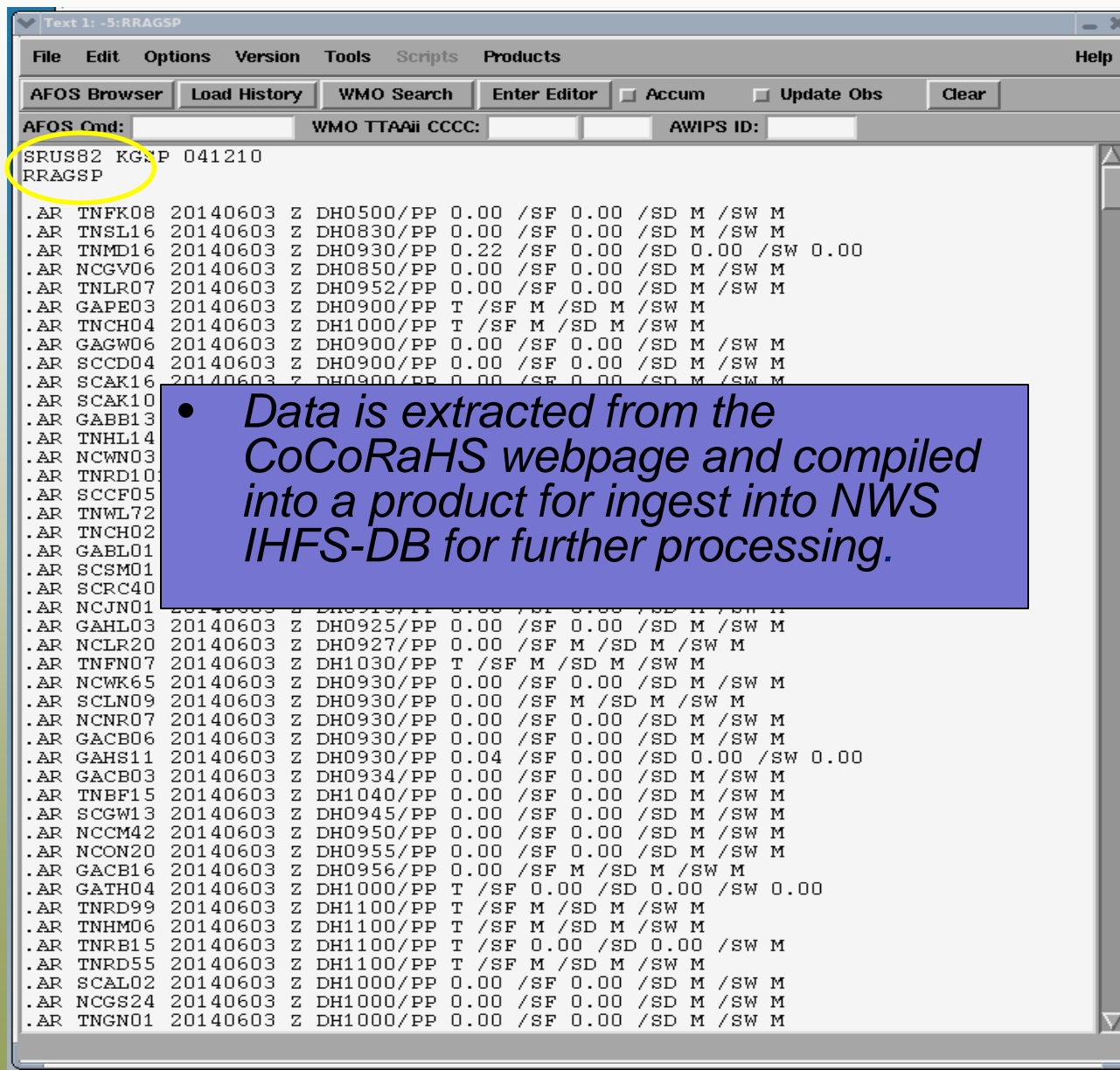
Station TX-CML-17

Active Stations
North Carolina

***We need volunteers east of Boone in
Foothill/Piedmont Counties:***



How Our Office Uses CoCoRaHS Data:



Text 1: -5:RRAGSP

File Edit Options Version Tools Scripts Products Help

AFOS Browser Load History WMO Search Enter Editor Accum Update Obs Clear

AFOS Omd: WMO TTAai CCCC: AWIPS ID:

SRUS82 KGSP 041210
RRAGSP

- Data is extracted from the CoCoRaHS webpage and compiled into a product for ingest into NWS IHFS-DB for further processing.

.AR TNFK08 20140603 Z DH0500/PP 0.00 /SF 0.00 /SD M /SW M
.AR TNSL16 20140603 Z DH0830/PP 0.00 /SF 0.00 /SD M /SW M
.AR TNMD16 20140603 Z DH0930/PP 0.22 /SF 0.00 /SD 0.00 /SW 0.00
.AR NCGV06 20140603 Z DH0850/PP 0.00 /SF 0.00 /SD M /SW M
.AR TNLR07 20140603 Z DH0952/PP 0.00 /SF 0.00 /SD M /SW M
.AR GAPE03 20140603 Z DH0900/PP T /SF M /SD M /SW M
.AR TNCH04 20140603 Z DH1000/PP T /SF M /SD M /SW M
.AR GAGW06 20140603 Z DH0900/PP 0.00 /SF 0.00 /SD M /SW M
.AR SCCD04 20140603 Z DH0900/PP 0.00 /SF 0.00 /SD M /SW M
.AR SCAK16 20140603 Z DH0900/PP 0.00 /SF 0.00 /SD M /SW M
.AR SCAK10
.AR GABB13
.AR TNHL14
.AR NCWN03
.AR TNRD10
.AR SCCF05
.AR TNWL72
.AR TNCH02
.AR GABL01
.AR SCSM01
.AR SCRC40
.AR NCJN01
.AR GAHL03 20140603 Z DH0925/PP 0.00 /SF 0.00 /SD M /SW M
.AR NCLR20 20140603 Z DH0927/PP 0.00 /SF M /SD M /SW M
.AR TNFN07 20140603 Z DH1030/PP T /SF M /SD M /SW M
.AR NCWK65 20140603 Z DH0930/PP 0.00 /SF 0.00 /SD M /SW M
.AR SCLN09 20140603 Z DH0930/PP 0.00 /SF M /SD M /SW M
.AR NCNR07 20140603 Z DH0930/PP 0.00 /SF 0.00 /SD M /SW M
.AR GACB06 20140603 Z DH0930/PP 0.00 /SF 0.00 /SD M /SW M
.AR GAHS11 20140603 Z DH0930/PP 0.04 /SF 0.00 /SD 0.00 /SW 0.00
.AR GACB03 20140603 Z DH0934/PP 0.00 /SF 0.00 /SD M /SW M
.AR TNBF15 20140603 Z DH1040/PP 0.00 /SF 0.00 /SD M /SW M
.AR SCGW13 20140603 Z DH0945/PP 0.00 /SF 0.00 /SD M /SW M
.AR NCCM42 20140603 Z DH0950/PP 0.00 /SF 0.00 /SD M /SW M
.AR NCON20 20140603 Z DH0955/PP 0.00 /SF 0.00 /SD M /SW M
.AR GACB16 20140603 Z DH0956/PP 0.00 /SF M /SD M /SW M
.AR GATH04 20140603 Z DH1000/PP T /SF 0.00 /SD 0.00 /SW 0.00
.AR TNRD99 20140603 Z DH1100/PP T /SF M /SD M /SW M
.AR TNHM06 20140603 Z DH1100/PP T /SF M /SD M /SW M
.AR TNRB15 20140603 Z DH1100/PP T /SF 0.00 /SD 0.00 /SW M
.AR TNRD55 20140603 Z DH1100/PP T /SF M /SD M /SW M
.AR SCAL02 20140603 Z DH1000/PP 0.00 /SF 0.00 /SD M /SW M
.AR NCGS24 20140603 Z DH1000/PP 0.00 /SF 0.00 /SD M /SW M
.AR TNGN01 20140603 Z DH1000/PP 0.00 /SF 0.00 /SD M /SW M

Text 1: LCOGSP

File Edit Options Version Tools Scripts Products

AFOS Browser Load History WMO Search Enter Editor

AFOS Cmd: WMO TTAaI CCCC:

SXUS52 KGSP 041415
LCOGSP

COCORAHs PRECIPITATION SUMMARY
NATIONAL WEATHER SERVICE GREENVILLE SPARTANBURG
1015 AM EDT WED JUN 04 2014

COCORAHs PRECIPITATION REPORTS
THESE REPORTS ARE CONSIDERED SUPPLEMENTAL AND UNOFFICIAL
VALUES ARE FOR THE PREVIOUS 24 HOURS ENDING AROUND 7 AM LOCAL TIME

.B GSP 0604 E DH07/PP/SF/SD/SW
:
:COCORAHs PRECIPITATION REPORTS IN WESTERN NORTH CAROLINA
:
:
:ID LOCATION ELEV PCPN SNOW FALL SNOW DEPTH WATER EQUIV
:
:
NCPK25 : COLUMBUS 1.7 SSE * 1109: 0.02 / MM / MM / MM
NCYN13 : BURNSVILLE 5.9 SSW * 3816: 0.01 / MM / MM / MM
NCBC62 : MONTREAT 0.6 NE * 2925: T / MM / MM / MM
NCCT07 : NORTH HICKORY 1.4 WNW * 1059: T / MM / MM / MM
NCPK22 : COLUMBUS 2.3 ESE * 1024: T / MM / MM / MM
NCBC58 : ASHEVILLE 3.8 E * 2179: 0.00 / 0.0 / 0.0 / MM
NCPK16 : COLUMBUS 7.3 ESE * 917: 0.00 / 0.0 / 0.0 / MM
NCWT06 : BLOWING ROCK 4.4 NE * : 0.00 / 0.0 / 0.0 / 0.00
NCWT11 : POSCOE 1.2 WSW * 3270: 0.00 / 0.0 / 0.0 / MM
NCAV04 : LINVILLE 2.4 ENE * 4320: 0.00 / 0.0 / MM / MM
NCAV07 : LINVILLE FALLS 0.5 SW * 3362: 0.00 / 0.0 / MM / MM
NCAV10 : PLUMTREE 0.5 W * 3009: 0.00 / 0.0 / MM / MM
NCBC21 : ASHEVILLE 4.0 NNE * 3009: 0.00 / 0.0 / MM / MM
NCBC22 : SKYLAND 1.0 W * 2200: 0.00 / 0.0 / MM / MM
NCBC25 : SWANNANOA 2.6 WNW * 2221: 0.00 / 0.0 / MM / MM
NCBC32 : CANDLER 5.0 SW * 2522: 0.00 / MM / MM / MM
NCBC53 : ASHEVILLE 5.4 N * 2736: 0.00 / 0.0 / MM / MM
NCBC64 : WEAVERVILLE 4.2 N * 2159: 0.00 / MM / MM / MM
NCBK02 : GLEN ALPINE 2.8 S * 1128: 0.00 / 0.0 / MM / MM
NCBK04 : GLEN ALPINE 0.7 WSW * 1262: 0.00 / 0.0 / MM / MM
NCBK09 : MORGANTON 2.1 SSW * 1178: 0.00 / MM / MM / MM
NCCB01 : KANNAPOLIS 5.2 E * 800: 0.00 / 0.0 / MM / MM
NCCB08 : CONCORD 4.5 SW * 636: 0.00 / 0.0 / MM / MM
NCCB15 : CONCORD 1.0 SW * 745: 0.00 / 0.0 / MM / MM
NCCK07 : MURPHY 15.5 WNW * 1649: 0.00 / 0.0 / MM / MM
NCCT02 : HICKORY 2.4 NW * 966: 0.00 / 0.0 / MM / MM
NCCV03 : KINGS MOUNTAIN 1.6 SW * 904: 0.00 / 0.0 / MM / MM
NCDV02 : ADVANCE 0.2 ESE * 835: 0.00 / 0.0 / MM / MM
NCDV03 : MOCKSVILLE 7.4 NNW * 763: 0.00 / 0.0 / MM / MM

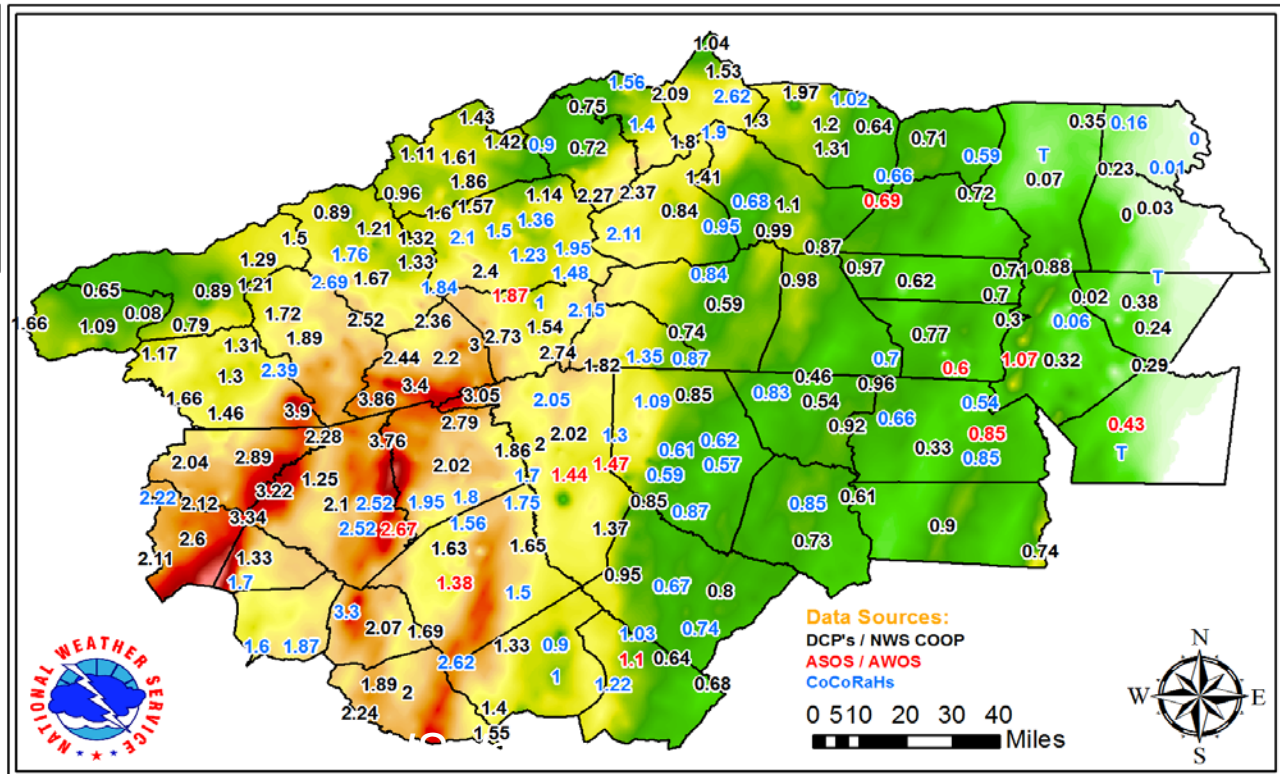
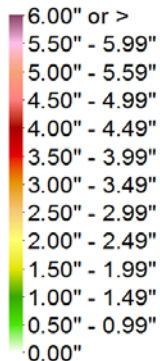
- *Daily summary text product compiled and transmitted.*

Daily rainfall map composed:

National Weather Service Greenville/Spartanburg 24Hr Precipitation - Thru 7AM 5/15/2014



Precipitation In Inches



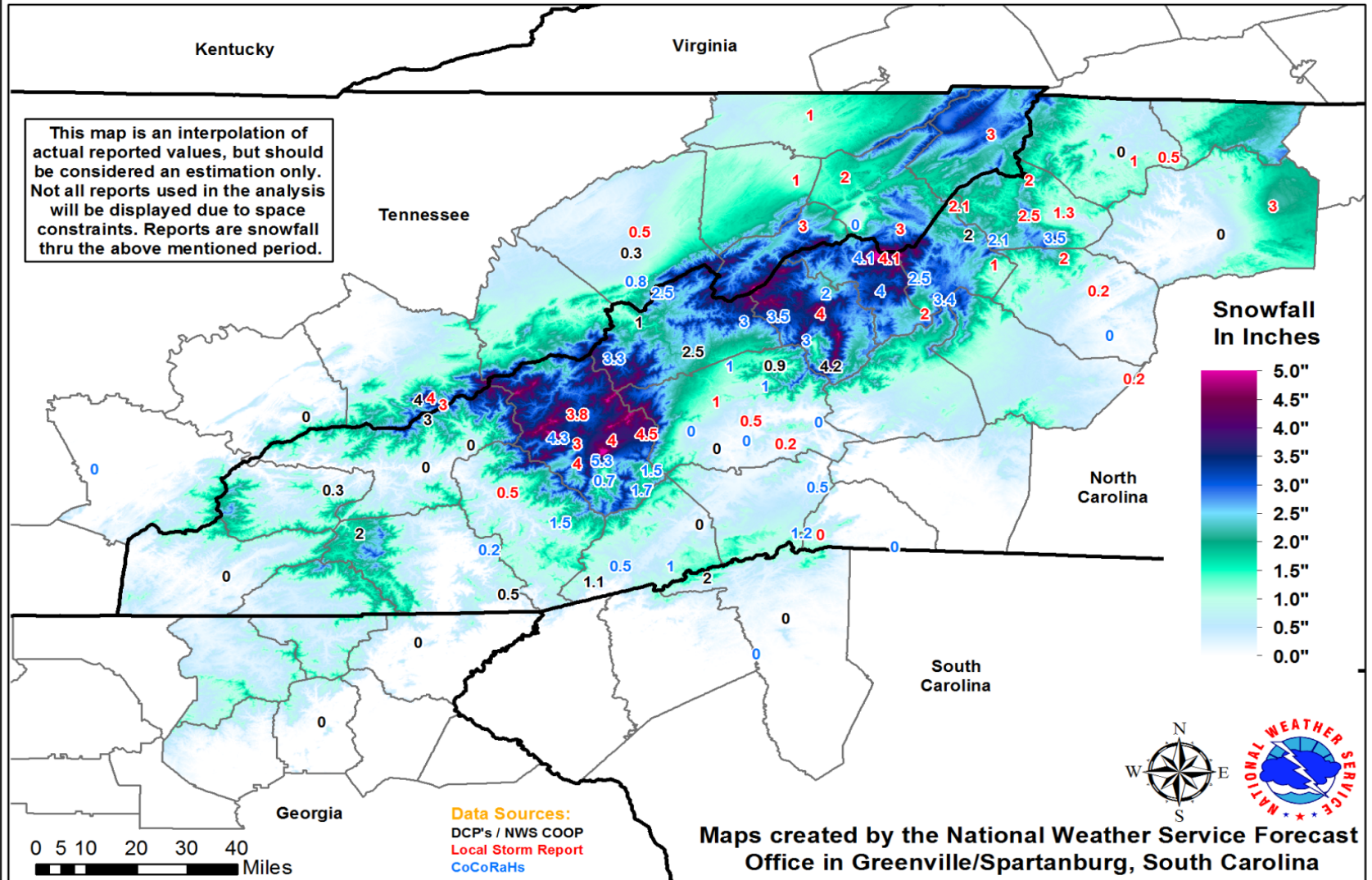
This map is an interpolation of actual reported values, but should be considered an estimation only. Not all reports used in the analysis will be displayed due to space constraints. Reports are 24 hour precipitation from yesterday morning through this morning.

Maps created by the National Weather Service Forecast
Office in Greenville/Spartanburg, South Carolina

Event snowfall map composed:

Southern Appalachian Snowfall 24 hr Snowfall ending 11 am Tue March 25 2014

This map is an interpolation of actual reported values, but should be considered an estimation only. Not all reports used in the analysis will be displayed due to space constraints. Reports are snowfall thru the above mentioned period.



Educational Outreach Activities:

CoCoRaHS COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK
"Because every drop counts"

Home | States | View Data | Maps | My Data | My Account | Admin | Logout

Hail Pad Examples

Rain Drops

Soft Hail Stones

Main Menu

- Home
- About Us
- Join CoCoRaHS
- Contact Us
- Donate

Resources

- FAQ / Help
- Education
- Training Slide Shows
- Training Video
- Drought Impacts
- Volunteer Coordinators
- Hail Pad Distribution Drop-off
- Help Needed
- Printable Forms
- The Caption
- Message of the Day
- Data Analysis
- CoCoRaHS Blog
- Web Groups
- State Newsletters
- Sponsors
- Presentations
- Links
- CoCoRaHS Store





Training Slide Shows

Click on one of the CoCoRaHS Training Slide-Shows below to view as HTML or download as PDF.



CoCoRaHS 'STATE CLIMATES' SERIES



- It only takes a few minutes a day
- Students collect measurements and report data
- Compare data with other schools

COLLABORATE!!

Things to know about...

Rain

- [Overview](#)
- [Weather Radar](#)
- [Measuring Rain](#)

Hail

- [Overview](#)
- [Hail Facts](#)
- [Hail Figures](#)
- [CoCoRaHS & Hail](#)
- [Hail Pad Examples](#)
- [Measuring Hail](#)

Snow


- [Overview](#)
- [Measuring Snow](#)



CoCoRaHS WxTalk Webinar Series

"Helping to provide the public with a better understanding of weather and climate"

HOW CAN YOU BECOME AN OBSERVER?

A clear plastic rain gauge is mounted on a wooden post in a grassy field. In the background, a vibrant rainbow is visible against a soft, hazy sky.

Five easy steps:

**Simply sign-up on the
CoCoRaHS web page
www.cocorahs.org*

**Obtain a 4" plastic rain gauge
(info available on web site)*

**View the "training slide show" or
attend a training session*

**Set-up the gauge in a "good"
location in your backyard*

**Start observing precipitation
and report on-line daily*

Your local CoCoRaHS Coordinators

WFO GSP:

Jeffrey Taylor: jeff.taylor@noaa.gov

Chris Horne: christopher.horne@noaa.gov

For more information visit:



www.cocorahs.org

