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February 2016

# CISA & CoCoRaHS Condition Monitoring Newsletter

Dear CoCoRaHS Observer,

We hope that 2016 has been off to a great start for you. In this newsletter we provide a recap of the winter weather in the regional climate update.

We also highlight what we have learned from the Condition Monitoring Project in two different articles. We share information that many of you provided in the volunteer feedback surveys sent out in 2015. In the second article, we discuss how The National Weather Service (NWS) uses citizen science information and what we learned in our interviews with various NWS staff about how they use CoCoRaHS information.

Finally, we selected Melinda Ball for observer of the month and recognize her contributions. Over the years she has been a dedicated observer, and we hope you gain some new ideas from Melinda's report and photos.

We hope you enjoy this newsletter, and as always, do not hesitate to reach out to us at [cisa@sc.edu](mailto:cisa@sc.edu).

Sincerely,

The CISA Team - Amanda, David, Henrik, Kirsten,  
Kirstin, Meghan and Sumi

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## Regional Climate Update

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During the past few months, the Carolinas have experienced a wide range of weather conditions from snow to a beautiful and sunny 70 degree day. Key points from December and January's climate summaries by the Southeast Regional Climate Center (SERCC) are highlighted below:

### December 2015 climate summary

- Temperature and precipitation levels were above normal.
- All states in the Southeast had their warmest December on record (Figure 1) according to long-term record analysis by the National Centers for Environmental Information.
- Some areas had enough precipitation that resulted in setting the wettest-month on record.
- These above-normal temperature and precipitation conditions resulted in impacts throughout the region such as flooded yards and homes.
- The low number of chill hours with temperatures between 32 to 45 degrees Fahrenheit that occurred in December might contribute to future impacts such as reduced peach and blueberry crop productivity during the 2016 harvest.

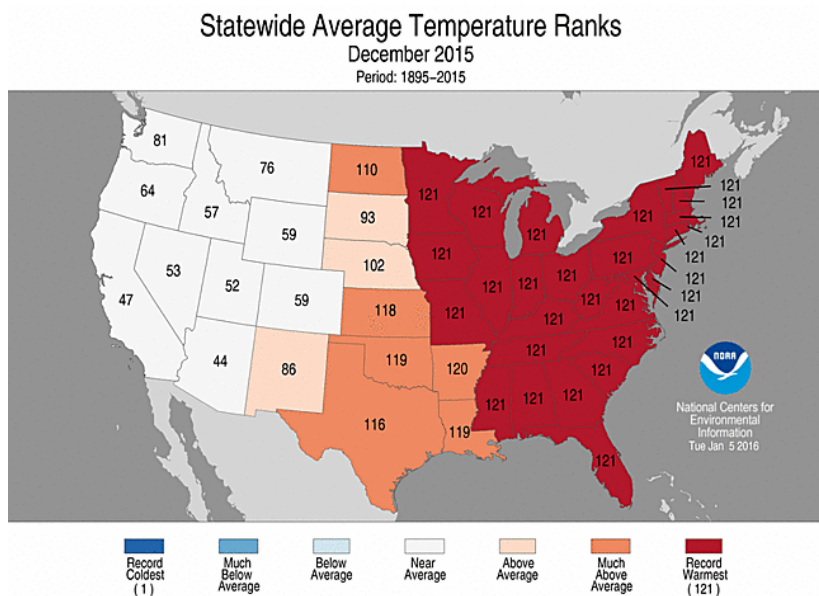


Figure 1. Statewide average temperature ranks based on an analysis by National Centers for Environmental Information.

### January 2016 climate summary

- In contrast to December 2015, parts of the Southeast experienced below-average temperatures.

- Every state except Florida had measurable snowfall in January. In mid-January, some parts of the Southeast felt the impacts of a coastal cyclone, commonly referred to as "Winter Storm Jonas" by The Weather Channel. Based on the Northeast Snowfall Impact Scale (NESIS), NOAA determined the snowstorm to be a Category 4 event for the Southeast while it was a Category 5 event for the Northeast.
- Despite having snowfall, most of the Southeast had below-normal precipitation totals for the month. Parts of east-central Georgia, central Carolinas, and southwest Virginia were among the driest in the Southeast with monthly precipitation only 50 to 25 percent of normal. However, no drought conditions were declared in the Southeast, with the exception of Puerto Rico.



Observer Chris Lumpp from North Carolina submitted photos documenting the ice and snow that accumulated where he lives.

### February 2016

- Full analyses of February conditions have not been released yet by SERCC, but if you consider Groundhog Day predictions by the famous Punxsutawney Phil in Pennsylvania and also Sir Walter Wally's prediction in North Carolina, we should be expecting an early spring. Observer Karen Shuck from Georgia shared some photos of

blooming azaleas near her, which also shows promises of spring on its way.

- For current month-to-date analyses of maximum temperature, minimum temperatures, average temperature, and total precipitation, check out [SERRC's climate perspectives map](#).



Azalea's blooming in Georgia. Photo submitted by Karen Shuck

Although we are not experiencing drought in our region, you can learn more about current drought conditions in other parts of the country by checking out the U.S. Drought Monitor Map [here](#). It is released weekly on Thursday mornings, 7 am EST.

## Volunteer Survey Feedback Recap: What You Told Us!

Partnering with CoCoRaHS and stakeholders in North and South Carolina, CISA initiated the Citizen Science Condition Monitoring Project in 2013 with the purpose of cultivating a better understanding and monitoring of drought impacts through volunteer engagement. Follow-up surveys were distributed to volunteers in order to examine the patterns of participation and the motivation behind them.

Many of you participated in at least one of the three surveys that were distributed over this last year. The results were incredibly helpful in furthering our understanding of what is working, what might need some tweaking and what is most helpful to you. The focus of these surveys centered on evaluating the usefulness of training and education materials, motivation, and participation

habits. Successful citizen science engagement is reliant on feedback from those who are contributing. So, here is what you had to say:

### Reporting frequency

Overall, submitting condition monitoring reports on a weekly or monthly basis increased during the first year of the project. However, during the course of the project, the total number of participants actively submitting reports declined. The most common reason given for the decrease was forgetting to report. Another contributing factor was people not submitting reports when conditions were stable. Even if there are no significant variations in the environmental conditions, it is important to maintain consistent entries.

### Participation

An overwhelming number of contributors indicated that they are willing to extend their participation beyond their one year period! Hopefully these veteran observers will continue to find significance in their work and provide reporting examples for new volunteers. An eagerness to learn and a desire to contribute to scientific knowledge are the main motivators behind lasting participation.

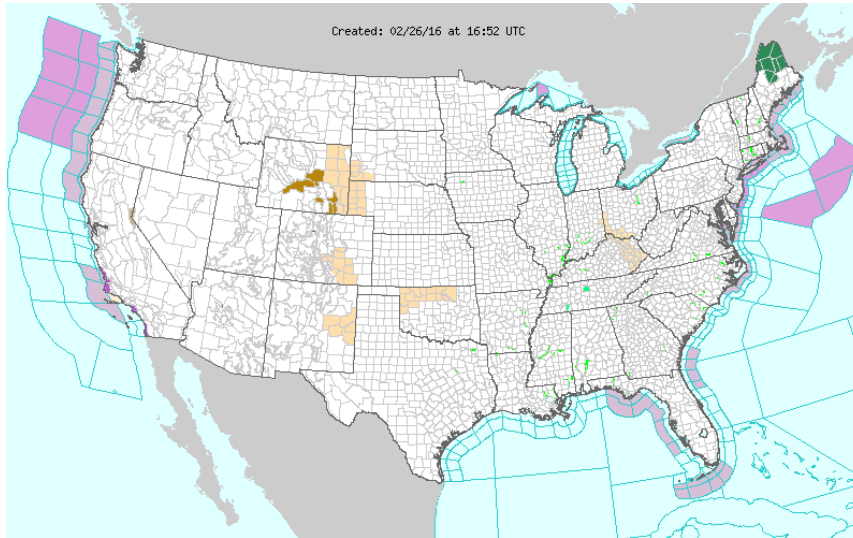
### Education

As observers became more comfortable with their role in the project, they said that their weather and climate knowledge increased, as did their interactions with the local environment. Some people indicated that they are still unsure of what information is most pertinent to decision makers. See [this](#) information on the CoCoRaHS site that shows who uses your reports. The survey results also showed that observers have gained an increased understanding of the importance of condition monitoring by participating in this project.

## **The National Weather Service and Citizen Science**

Part of the National Oceanic and Atmospheric Administration under the Department of Commerce, The National Weather Service (NWS) aims to make the U.S. more weather-ready by providing climate, weather, and water data and hydrological and meteorological forecasts. Anyone can access [the forecast maps](#) and data that the NWS regularly updates. The NWS uses these forecasts with real-time observations provided by radar and satellites to provide emergency warnings and notifications to local governments and media outlets. Examples include local drought response committees, the U. S. Drought Monitor, and

flash flood warnings.



Areas with a weather alert issued by the NWS. Detailed information about the types of alerts can be found on the [NWS homepage](#).

While the NWS collects data from many different sources, including co-op weather stations, stream gages, and satellites, the foundations of national weather monitoring has always depended on volunteers for local weather information. According to the NWS's interactive timeline, weather observations by local volunteers can be traced as far back to the records kept by many colonial leaders, such as Thomas Jefferson. As the weather observation networks expanded and meteorological equipment developed, more formal weather monitoring and forecasting resulted in the establishment of the Weather Bureau Service, which later became the NWS in 1970.

Today, citizen science still plays an important role in NWS efforts. CISA team members interviewed hydrologists and meteorologists from six different National Weather Service local offices during Phase 1 of the condition monitoring project. These individuals also serve as the regional CoCoRaHS coordinator for their service area. We asked them questions about how they currently use CoCoRaHS data and the value of the information from the condition monitoring reports. Here is what they shared with us:

- The NWS staff we interviewed regularly used CoCoRaHS precipitation information. They find the precipitation data extremely useful since it helps validate other data the NWS collects and fill in gaps where the NWS does not have a weather monitoring station. Some of the NWS staff we interviewed said they looked at the monthly climate

- summaries while others looked for the wettest and driest stations to get an idea of different extremes.
- Almost all the NWS staff we interviewed found CoCoRaHS observations to be a reliable source of information, especially if the observer submitted reports consistently. They also stressed the importance of reporting zeroes in precipitation reports since these reports provide just as valuable information as the other precipitation reports.
  - All of the interviewees had positive reviews about the condition monitoring reports and the information provided by observers. Most of the NWS staff we talked with stressed that condition monitoring provides useful information about local weather impacts and on-the-ground context to the other precipitation and temperature data that the NWS uses regularly.
  - However, a common challenge mentioned across all the interviews was their ability to easily access the condition monitoring reports in a spatial context and quickly gather main points from the reports.

The feedback from the NWS about how they use CoCoRaHS data and what they like about condition monitoring reports has helped the CISA team design Phase 2 of the Condition Monitoring Project. In Phase 2, we will be launching a new reporting form that will allow us to display observations on a web map that can be easily accessed and used by different information users, such as the NWS staff. Be on the lookout for an update about Phase 2 and the changing condition monitoring form in next month's newsletter.

## Condition Monitoring Star of the Month

Melinda Ball from Aiken County, South Carolina has been selected as the observer of the month. She has been submitting precipitation reports since becoming a CoCoRaHS observer in November 2008. After joining CISA's condition monitoring project in 2013, Melinda started writing monthly condition monitoring reports to describe local conditions in her neighborhood and surrounding areas, as she does below in her December and early January report:

*"The month of December started out very dry and we ended up with flooding rains at the end of the month. Total rainfall measured was 6.57" here in North Augusta where I live...Normal rainfall for the CSRA is 3.39" The excess rainfall and runoff from rains elsewhere upstream flooded the Savannah River. The river stayed around 112 ft. throughout the month of December. Heavy rains here and across the region upstream caused Lake Thurmond to reach a record level full pool of 336 ft. ...On*

*Thursday December 31st the flood gates were opened at the Thurmond Dam. Water slowly crept into the neighborhood all day and water started rising rapidly on December 31st. We could see the 1st signs of the neighborhood flooding later New Year's Eve before midnight. On New Year's morning, we woke up to flooded roads in the neighborhood and some neighbors reported flooding in their basements anywhere from 2-4 ft. Water continued to rise during the day on New Year's Day at a rate of one inch per hour. We started measuring the water rise at 11:30pm and by 6pm almost one foot of water had risen throughout the neighborhood. Roads flooded even more with this rapid water rise during the day. Water flooded our backyard and slowly crept its way across the side of our yard and filled our driveway across the low spot. Thankfully the water stopped just before reaching our basement garage. The river crest was 118.3ft. Thankfully water went down on Saturday January 2nd. Roads in the neighborhood were now passable once the water went down on Jan 2nd. Most houses that flooded are now drying out. There are only 2 houses that still have about 2 feet of water in their basement... Other areas that have been affected by the high river water here in the area are in North Augusta, river docks behind houses in the River Club neighborhood collapsed, the Augusta riverfront marina has been closed due to being underwater, & the Augusta Riverwalk has been closed as well due to being underwater. We had our 1st rainfall of January today. 0.19" fell. This should not affect the river level too much..."*



Flooded neighborhood in North Augusta, SC - submitted by Melinda Ball.



Melinda does a great job of providing a detailed explanation of the conditions she observed in her area by using specific indicators. For example, Melinda provides information on changes in the total rainfall, the river crest, and lake level. By including this quantitative information in her report, Melinda puts her observations in the context of information that agencies such as the National Weather Service already use in their forecasts. This gives the NWS and other CoCoRaHS information users a better understanding of the local conditions that led to the other impacts Melinda describes later in her report. If you're interested in including lake and river levels for water bodies near your location in your reports, you can access this information from the United States Geological Survey or the National Weather Service data viewer for river conditions and forecasts. These sites also note whether water levels at the gage are at or near a flood stage.



"The Thurmond Dam became a hot tourist spot to watch the flood waters go. Many people went to the Dam and had their pictures taken with the rushing water coming out of the Dam in the background" - from Melinda's December Report. Photo of Thurmond Dam submitted by Melinda Ball.

Melinda also tells us how much the water in her neighborhood was rising over a short period of time by using specific measurements and by describing the impacts such as the conditions of local roads and the water levels in flooded basements. She discusses the impacts of local flooding in surrounding neighborhoods in North Augusta and Augusta, which gives a broader picture of surrounding conditions and the spatial extent of the flood damage.

Graduate student Sumi Selvaraj reached out to Melinda to learn more about how she became interested in Condition Monitoring and CoCoRaHS. Below, we share some of Melinda's responses and tips for other CoCoRaHS observers:

**1. Why did you decide to participate in the Condition Monitoring project?** *I was doing rainfall reports for CoCoRaHS and I got an email about this project. I participated in a conference call to learn more and learn how to participate. During this call I was shown a map which showed the state of SC and where the official rainfall monitoring sites were. I was shocked to see the areas in the state where there is no coverage for reports. I thought that I could assist with the CISA program by reporting my important information to help increase the coverage of reports across Aiken County for precipitation. I also found out during that conference call, that submitting a report was just as easy as submitting a report for CoCoRaHS. I knew my CoCoRaHS information could help with the mission of the CISA project as well.*

**2. Outside of CoCoRaHS, what defines you? How does this inform your monitoring?** *I have a degree from Florida State University in Meteorology. I do not work in meteorology anymore, but I remain very passionate about the subject...The CISA project helps me share my passion of meteorology with others since many read my reports across the state. Also, by submitting reports, I feel like I am giving back to the science community in ways that others can easily understand sometimes complicated information.*

**3. What are some memorable things that you have observed?** *Some memorable things that I have observed: (Not during CISA) I felt the power of a Category 5 Hurricane, going through Hurricane Andrew when I was in high school in south Florida. Also since living in North Augusta, I have seen golf ball size hail fall in an afternoon thunderstorm. Since the CISA project started, I have observed the impacts & destruction of a major ice storm. I have also observed the power of rising & fast moving water in floods since moving into a new house on the banks of the Savannah River here in North Augusta, SC.*



Melinda took a photo of the hail she collected during a 2007 summer storm in North Augusta. Her photo shows how to measure hail by placing other objects near the ruler for comparison.

**4. What tips do you have to other observers about recording precipitation and condition monitoring?** *Every little detail that you can put into an observation, no matter how subtle, it is important. It is also very important to be as descriptive as possible. Finally, when taking precipitation measurements accuracy is important. Use the old fashion rain gauge with the wide mouth opening and tube. Tipping bucket rain gauges have their advantages, but every drop that falls needs to be collected and measured.*

Thank you again Melinda for your detailed observations and your commitment as a dedicated CoCoRaHS observer! If you're interested in reading more condition monitoring reports, check out the [List of Drought Impacts Reports on the CoCoRaHS website](#) to search for and view more reports from fellow observers.

Feel free to contact us with any questions.

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