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carolinas integrated sciences & assessments

September 2015

CISA & CoCoRaHS Condition Monitoring Newsletter

Dear CoCoRaHS Observer,

Over the summer, the CISA team has been working on developing Phase 2 of the CoCoRaHS Condition Monitoring Project. We are looking for your feedback as we consider how to improve the reporting process and ways to display your reports through an interactive web map. **In the "CoCoRaHS Condition Monitoring Project Update" article, you'll find more information about our ideas and a short survey where you can share your thoughts and suggestions.**

Also during the past few summer months, the Carolinas have been experiencing dry conditions. Many areas are now classified at different stages of short-term drought according to the U.S. Drought Monitor. This month's "Drought Update for the Carolinas" expands on the current state of dry conditions in our region. To provide more information about how droughts like this one can emerge so quickly, you'll find an article on "flash droughts" in this newsletter. We also feature in this article images submitted by one of our regular observers, Christopher Lumpp from Nash County, NC, that document the emergence and intensification of drought conditions. Finally, examples from our "Condition Monitoring Star of the Month", Richard Figlar, demonstrate that regular condition monitoring provides detailed information about how dry conditions might quickly recover after a few weeks of regular precipitation.

As always, thank you for supporting the CISA and CoCoRaHS Condition Monitoring Project!

Sincerely,

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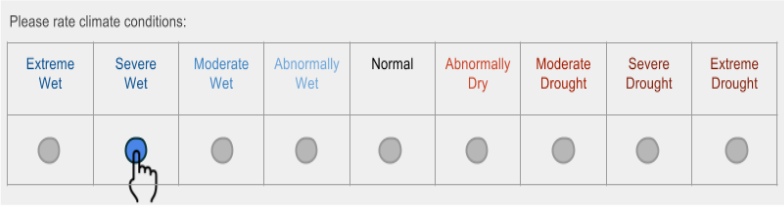
The CISA Team - Amanda, David, Kirsten, Kirstin, and Sumi

CoCoRaHS Condition Monitoring Project Update: Launching Phase 2

The CoCoRaHS condition monitoring project was launched in September 2013. Earlier this year, the CISA team began to solicit feedback from agencies that use CoCoRaHS data, including state climate offices and regional National Weather Service Offices. CISA wanted to learn more about how these drought decision makers in the Carolinas are able to use the information that each of you share in your weekly condition monitoring reports. We are now using this feedback to develop Phase 2 of the project.

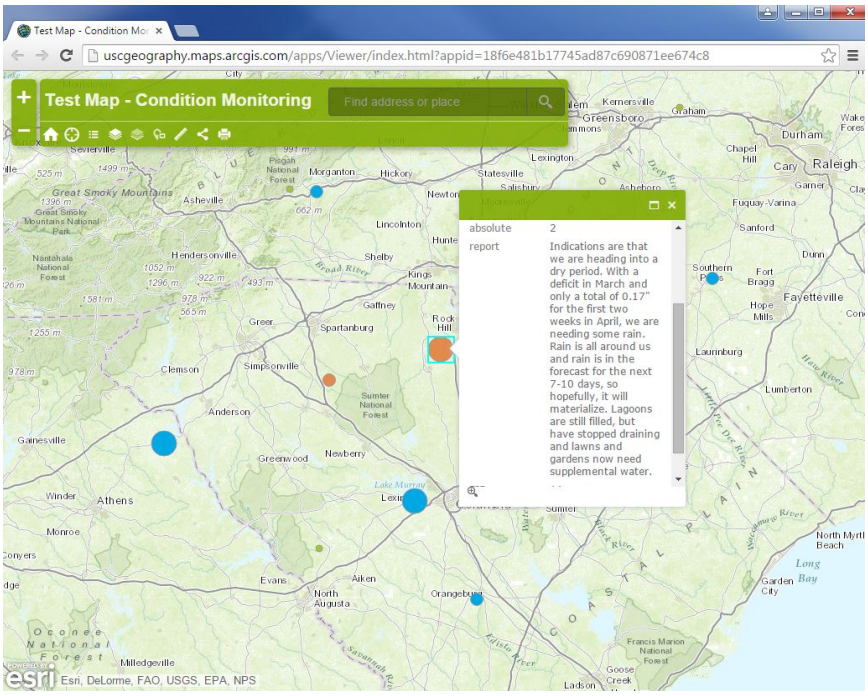
During feedback interviews, drought decision makers offered suggestions to improve detection of changing conditions. In response, the CISA team and folks at CoCoRaHS headquarters are researching ways to update the reporting form in order to quickly identify drying conditions in different regions. Initial plans look to incorporate a scale bar into the CoCoRaHS online reporting form, an option that would be used in conjunction with the condition monitoring report. The scale bar will allow citizen scientists to select from general categories that reflect the current conditions in their area. The scales bar will act as a metric for identifying weekly change in the condition monitoring reports, tagging a report with dry or wet conditions. As an example, categories might include:



Hypothetical example of a condition monitoring scale bar

In order to display the data collected by the scale bar, David Eckhardt, one of the graduate students working on the project, will create a web map which will provide a way to view condition monitoring data via the internet in an interactive way. Map users will be able to click on the monitoring station location in the map to view both past and present condition monitoring reports, giving the report a spatial context. Other functions to be incorporated into the map include: search options, map printing, and a time slider.

The web map will update on a regular basis, providing timely access to incoming condition monitoring reports. Additionally, the map layers will change according to the weekly selection made on the scale bar, allowing drought decision makers to more easily identify changing conditions from week to week.



Example of a web map with observer's county location, extent of dry-wet conditions, and condition monitoring report content in a call-out box.

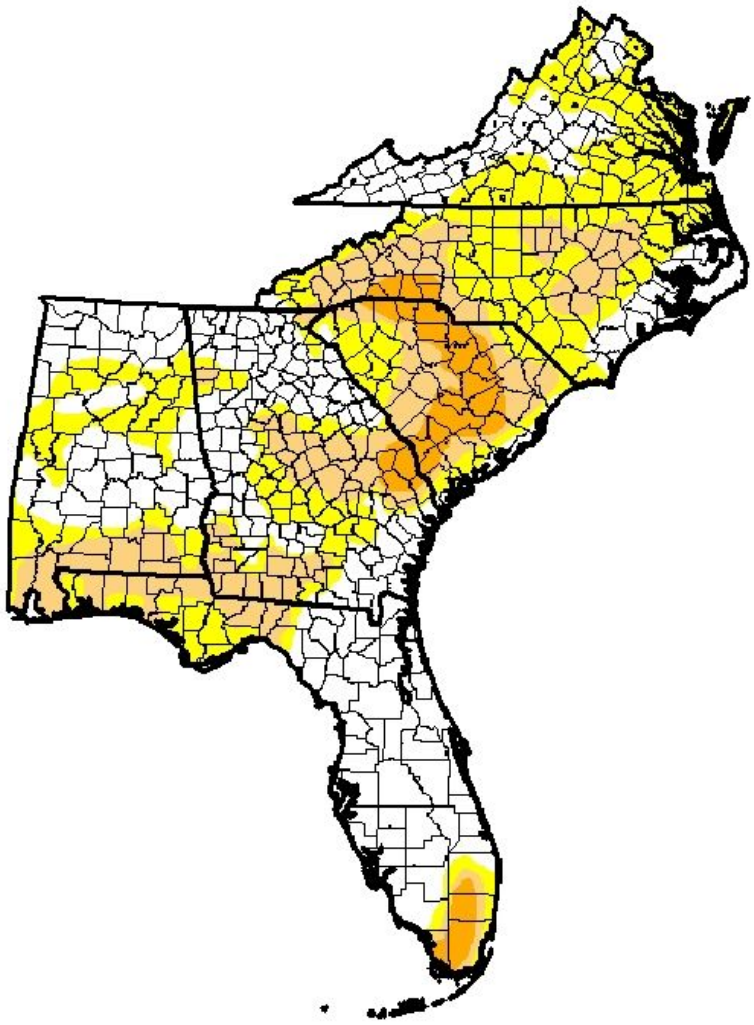
The CISA team is excited about implementing the condition monitoring web map, and we are always grateful to receive any feedback from you. If you would like to give your opinion on the web map or condition monitoring scale bar, please answer this easy **survey**.

In keeping with CoCoRaHS protocol to ensure privacy for volunteers, no personal information will be used in the web map. Additionally, the exact location of stations will be obscured to ensure privacy.

Drought Update for the Carolinas

Dry conditions persist in the Carolinas according to the most recent U.S. Drought Monitor (USDM) from September 10th. The majority of North Carolina (83.33%) and South Carolina (92.61%) have some drought classification between D0 (abnormally dry) to D2 (severe drought). Drought intensified in the central Carolinas while the Coastal Plains remains the only region in South Carolina without drought. The USDM

authors mention that the Vegetation Drought Response Index (VegDri) identifies plant stress associated with drought conditions in the central portion of South Carolina and western portion of North Carolina.



USDM map released September 10, 2015

If you notice anything different in your region from the USDM analysis, please let us know. The USDM focuses on broad-scale conditions, which means that it does not always capture the fine scale variation in local conditions. More information about drought in the Carolinas can be found from the North Carolina Drought Management Advisory Council and the South Carolina Drought Response Committee.

To learn more about dry conditions that emerged in the

Southeast this summer, check out the "Flash Drought in the Southeast" article below.

**Maps created by the U.S. Drought Monitor are typically published every Thursday morning by 8:30 am.*

Flash Drought in the Southeast

During the past few months, many of you have reported dry conditions emerging in your yards and community. The photos below from observer Christopher Lump in Nash County, NC, show water in his local creek diminishing during July. Other observers have submitted reports with detailed observations of their plants wilting and soil drying.

Figure 1. Photos of a Nash County, NC, creek drying up during July

Dry conditions like these have emerged in areas throughout the Southeast even beyond the Carolinas, leading to what some climatologists refer to as a "flash drought" in the region. Unlike the slow-onset of dryness that sometimes leads to drought, a flash drought refers to a very quick onset of dry conditions and associated impacts, according to climatologist Brian Fuchs in a USA Today article on flash drought. For example, despite record rainfall in Texas earlier this year, a recent U.S. Drought Monitor monthly update identifies that drought coverage for the state increased from 5% to 25% between August 4th and September 1st (Figure 2). The U.S. Drought Monitor Class Change Map below highlights the increase in drought classifications throughout the eastern part of Texas and much of Louisiana despite the region having received record rainfall in May. Drought classifications

expanded in parts of North Carolina while most of South Carolina remained in a similar drought classification during the month of August.

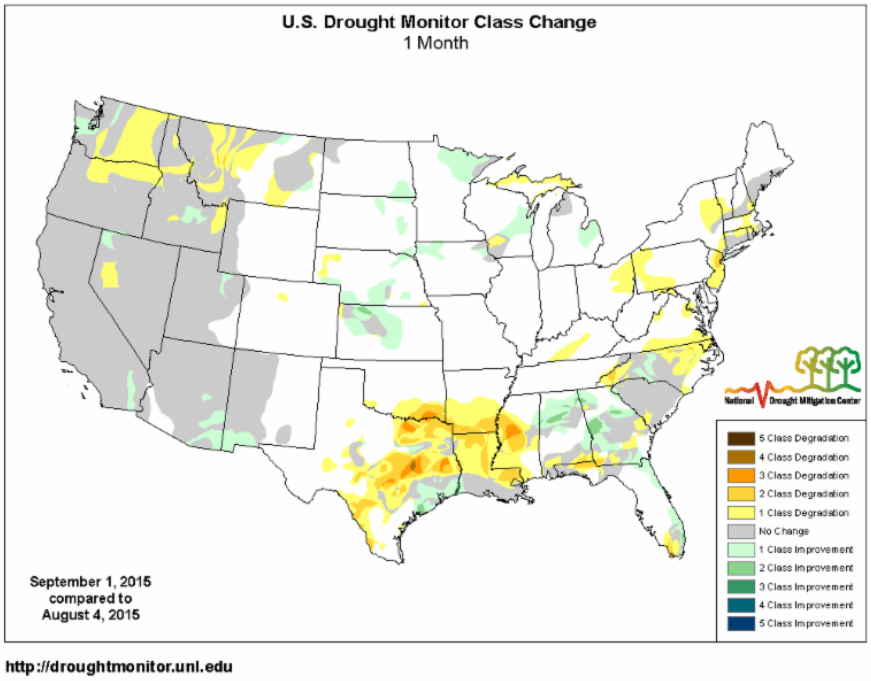


Figure 2. The change map above shows how the USDM drought classifications have changed in areas of the United States experiencing dry conditions during the month of August.

The emerging flash drought in the Southeast this year has been attributed to a combination of hot summer temperatures with less precipitation than usual in many areas. These conditions are possibly linked to drier summer associated with the strong El Niño developing in the Pacific Ocean this year as reported in this CNN article and by the National Oceanic and Atmospheric Administration's El Niño blog. However, as the waters of the eastern Pacific Ocean continue to warm and create a stronger El Niño that may last until spring of 2016, many parts of the U.S. can expect more precipitation during the winter months.

Hopefully, more precipitation will help alleviate these dry conditions, but we won't know for sure if the anticipated wetter weather will result in a "flash recovery" from the current flash drought in the Southeast. More pictures submitted by Christopher Lumpp in August of the same creek show signs of this promise due to some of the rainfall received near him later in August.

Figure 3. Photos from Nash County, NC of a creek after recent rainfall in August.

As summer turns into fall, hopefully bringing cooler weather and more rain, be sure to keep an eye out for various dry conditions or possibly any recovery that you see. Any information you share with us in your condition monitoring reports or via any photos you send will provide useful information to local officials trying to monitor drought and manage water resources effectively. Photos along with the date, location, and a brief description can be emailed to cisa@sc.edu.

Condition Monitoring Star of the Month

August's condition monitoring star of the month is Richard Figlar from Pickens County, SC. Richard submits regular reports detailing conditions that he observes relative to the rainfall totals he measures for the same time period. A value-added aspect of condition monitoring comes from the context that reports such as Richard's provide to precipitation measurements. Rather than just writing that little rain was received, he tells us the specific amount of rain that fell over a certain time period and describes dry conditions he observed during that same time, such as the "pre-autumnal yellowing of leaves" which indicates dryness of the soil column. Similarly as rainfall increased towards the end of August, Richard uses clear and succinct indicators to highlight how conditions have improved, such as the moisture of the soil column and the "lush lawn growth."

Richard's consistent reporting in August also shows how regularly submitted condition monitoring reports provide valuable information that informs us of whether dry conditions might be emerging or in recovery. For example, at the beginning of August, he describes the dryness in Pickens

County, but as the month progresses, he discusses increased rainfall in his area and how it has started to relieve the dry soil column. Additionally, in his last report for August, Richard mentions that "drought status is unchanged from last week," which helps us understand how conditions in the area remain similar to what he saw previously and provides a basis for comparison.

Below are samples of Richard's reports from the month of August. Thank you so much for participating, Richard, and keep up the great work!

8/10/2015	*After ample rains in June and July, during the last 11 days we have received only ineffective fractional amounts of rain totaling .25" while average afternoon temperature during this time of 92.3°along with very high insolation due to lack of cloud cover. This has combine to create incipient drought conditions in western Pickens County at this time. Although pasture land still appears to be ok, tulip trees (Tulip-popular, Liriodendron tulipifera) have developed pre-autumnal yellowing of leaves along with leaf drop. This is an excellent indicator of drying of the soil column. Thus, we have now entered an "abnormally dry" condition here in western Pickens, County.*
8/24/2015	*Last week my station as well as much (most) of Pickens County received significant rainfall over several days. In our case (SC-PC-1) 4.89" fell which brought total August rainfall to 5.58" which is some half inch over "nominal normal" with nearly a week still left in the month. Also summer rainfall, June-July-August, for this season is now 17.07" which is also 2 inches above "nominal" normal for those 3 months here. That said, incipient drought conditions have now clearly ended here, for western Pickens County and probably the rest of the county as well.*
8/31/2015	*Soil column is moist (at least from 2 feet down to surface) even on our ridge-top location. Lush lawn grown growth is evident throughout Pickens County. Drought status is unchanged from last week: "no drought"*

See 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.

Carolinas Integrated Sciences & Assessments
803-777-6875

cisa@sc.edu | www.cisa.sc.edu

University of South Carolina
Department of Geography
709 Bull Street
Columbia, SC 29208