

Mapping Drought Monitoring Reports to Improve Access & Usability

The CoCoRaHS Citizen Science Condition Monitoring Program

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2012 Carolinas Drought Early Warning System Scoping Workshop



Key information needs identified by drought decision makers:

- Improved on-the-ground drought impacts monitoring and reporting
- Understanding impacts not captured by traditional drought indices (e.g., agriculture, water supply, fire)
- Capturing more information about drought onset, intensification, and recovery



Community Collaborative Rain, Hail & Snow Network



- Daily precipitation measurements using the “official” 4” CoCoRaHS rain gauge
- Severe weather reports
- Drought impacts reports
 - Incorporated into the National Drought Impacts Reporter
- Online data entry (mobile apps also available)

Weekly Condition Monitoring

Connecting weather and climate to the environment

CISA recruited volunteers to submit weekly condition monitoring reports in addition to their daily precipitation measurements.

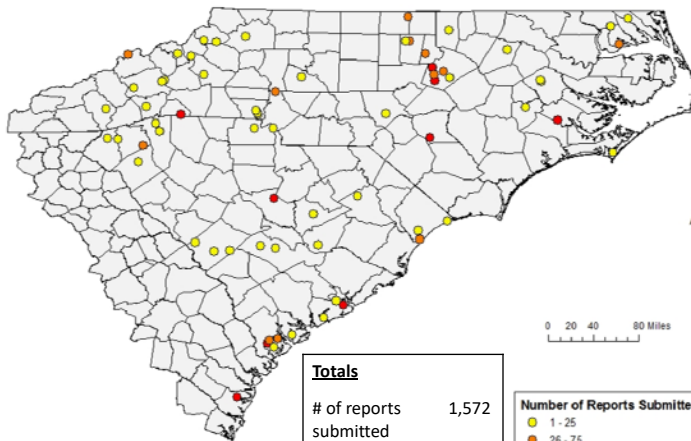
Regular observations help to identify:

- The early signs of drought
- When conditions begin to improve
- Any lingering impacts



Phase 1: 2013 - 2015

Condition Monitoring Reporter Locations, September 2013-December 2015



Current Condition Monitoring Reports

Caswell County, NC – March 12, 2017

Moderately Dry

Another roller coaster weather week in NC. T-shirt temperatures to where's my coat? Snow flurries for some this morning. Since the water is so low and the ground dry, **fire advisories** have been issued. On nice days there is much **activity on the lake**. Fields readied for crops, flowers blooming. **Lake level** is very slowly dropping, now 410.3'. *If this was prime growing season I would be extremely concerned.* Maybe the predicted rain this week will help.

Craven County, NC – March 13, 2017

Mildly Dry

We just have **not had much precipitation** in several weeks. It has been **warmer than average** here; so many things are **blooming very early**. This could be near catastrophic for bee forage this **next week** when the **temperatures will fall below freezing** for many hours several nights in a row. This could kill off the nectar producing blossoms.

Extreme Event Condition Monitoring Reports

Brunswick County, NC – October 15, 2016

Severely Wet

No direct impact on me, but **numerous people** in the southeast portion of the state are **severely impacted** by the aftermath of **Hurricane Matthew**. Roads are blocked, farmers' fields are inundated, homes are under water, beaches are eroded. Has the water supply been impacted by agricultural runoff? Testing stations are inaccessible due to flooding.

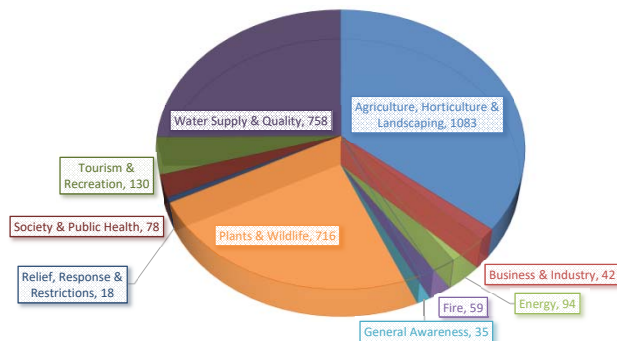
Macon County, NC – October 30, 2016

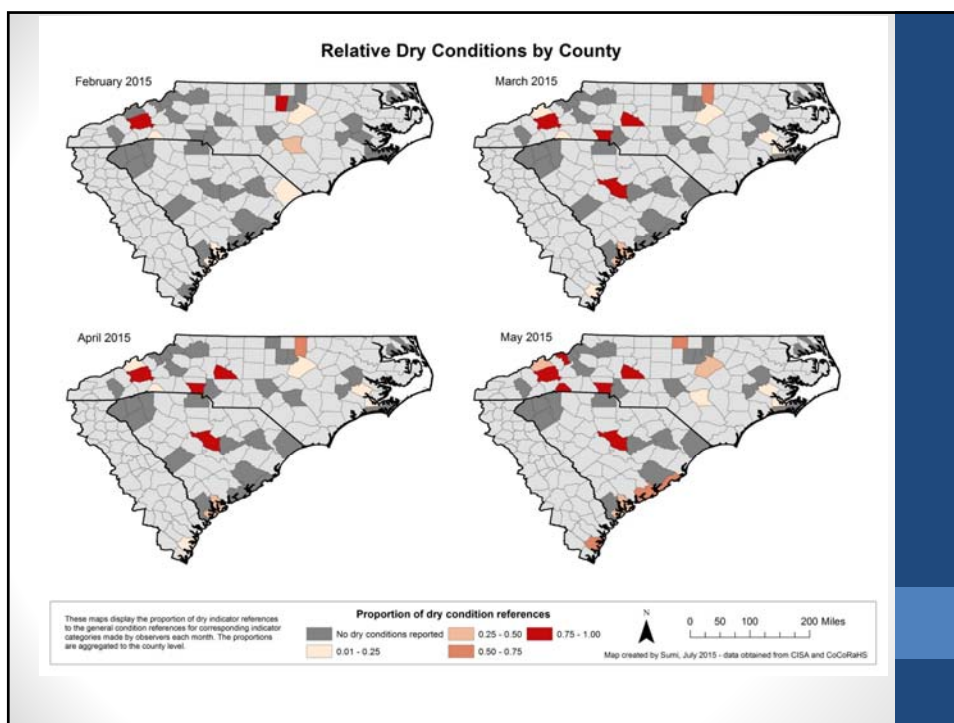
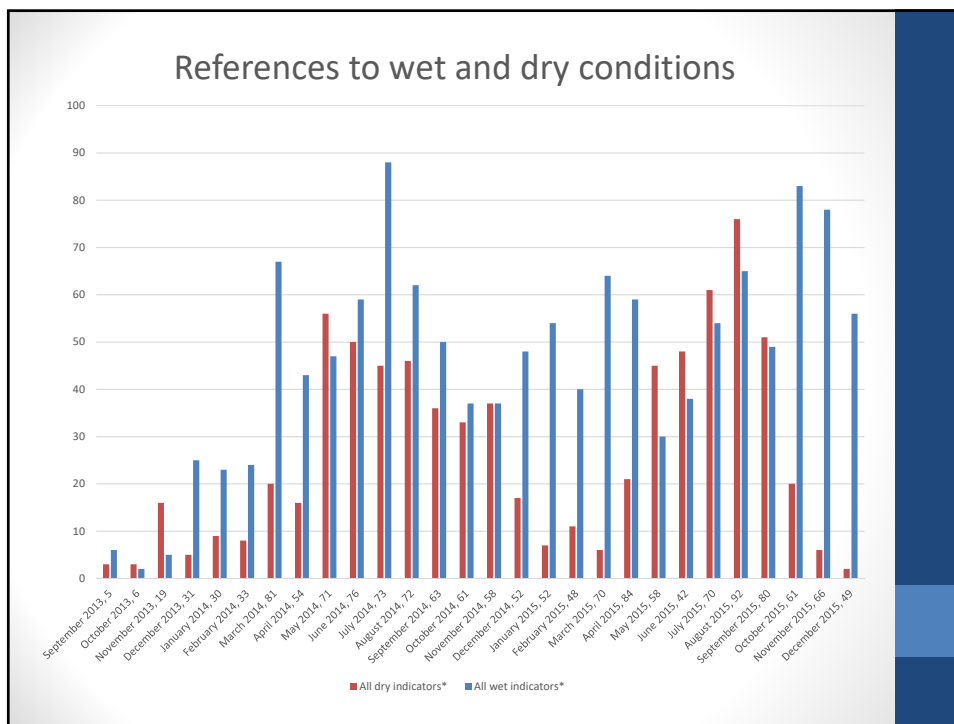
Severely Dry

0.16 inches of rainfall this month. Extreme drought conditions in Macon, Clay, and Cherokee counties, with major crop and pasture loss. **Worst drought conditions since 2011**. Streams and rivers remain low, and many springs are completely dry. Our fall wildfire season typically runs from mid-October to mid-December. Extreme caution with fires is needed. Two wildfires burning in Macon County today. Black Hawk helicopters from Franklin have been in use.

Report Analysis

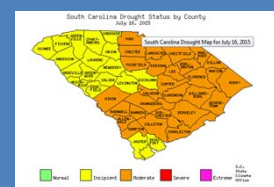
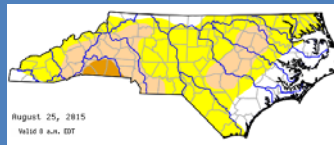
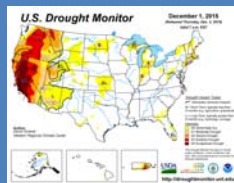
- Qualitative coding
 - Drought impact categories
 - Other report content (e.g., temp & precip data, soil moisture, etc.)
 - Spatial and temporal elements





Decision Maker Interviews

- December 2014-September 2015
- 11 interviews, 17 interviewees
 - NDMC – USDM authors (2), Drought Impact Reporter (1)
 - CoCoRaHS (2)
 - State Climate Offices – NC (2), SC (1)
 - NWS Forecast Offices (8)
 - York County Soil & Water Conservation District (1)



Summary of Interview Results



Visualization and Communications Feedback

- Charts, graphs and maps:
 - Provide a useful summary of the data
 - Could be used to help identify trends
 - Onset, recovery, transitions from one level to another
- Spatial scale and aggregation of information
 - County, hydrologic (HUC) boundaries are most useful
 - However, most observations report on backyard-household scale



View Data : List Condition Monitoring Reports

Search Condition Monitoring Reports

Station Fields: Station Number Station Name

Location: USA | South Carolina | ALL COUNTIES

Category: All Categories

Date Range:

Start Date: 10/11/2016 End Date: 10/11/2016

Search:

Searched: Stations in South Carolina Report date on 10/11/2016.

Showing 8 Records.

Report Date	Station Number	State	County	Scale Bar	Categories	Description	View
10/11/2016	SC-BF-10	SC	Beaufort	Severely Wet		It has been mildly dry this month, until last Friday when Hurricane Matthew hit. Recorded 10.63" of rain total. Mandatory evacuation. Returned last evening. Water everywhere, but then, it IS the lowcountry! We lost a full sized Japanese loquat tree, but other than that, very lucky. Our power was out only a short while unlike much of the rest of the area. Hilton Head Island is still evacuated. Next report in 2 weeks	
10/11/2016	SC-CA-15	SC	Calhoun	Mildly Wet	Plants And Wildlife	This site is a xeric sandy bluff. It had 6.10" of rain. There are a few springs flowing, but no standing water in the highlands on this site.	
10/11/2016	SC-HR-46	SC	Horry	Severely Wet	General Awareness	Ground is soggy still rom Hurricane Matthew	
10/11/2016	SC-LN-10	SC	Lancaster	Mildly Wet	Water Supply And Quality	Irrigation (via a lake reservoir)of 400 acres of common open space (Sun City Carolina Lakes)	
10/11/2016	SC-OC-30	SC	Oconee	Severely Dry	General Awareness	hadless than 1/4" in the last 2 weeks	
10/11/2016	SC-OC-42	SC	Oconee	Moderately Dry	Tourism And Recreation	the lake is down almost 5 feet	
10/11/2016	SC-PC-38	SC	Pickens	Moderately Dry	Plants And Wildlife	soil moisture in woods at a very low level the soil under leaf litter totally dry	
10/11/2016	SC-SM-1	SC	Sumter	Moderately Wet	General Awareness	Ground is moderately to mildly wet from the effects of Hurricane Matthew and the previous month's rainfall. Grass remains quite green yet is slowing in growth. Pine trees	

My Data Entry : Condition Monitoring Report Form

Condition Monitoring Report Form
Submit Data Reset

Station : CO-LR-607 - Fort Collins 3.8 SSW

Condition monitoring reports are submitted on a regular (weekly, biweekly, monthly) basis to share information about the effects of local precipitation on the environment and society. By submitting reports on a regular basis, you create a baseline to see change through time, such as seasonal differences or changes caused by more or less precipitation. Please refer to the Condition Monitoring training slide show for more information.
** Indicates required field*

Observation Date *
 4/13/2016

Condition Scale Bar More information on the scale bar

Severely Dry	Moderately Dry	Mildly Dry	Near Normal	Mildly Wet	Moderately Wet	Severely Wet
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Description
 Please provide a description of how dry, normal or wet conditions are affecting you, your livelihood, your activities, etc. *

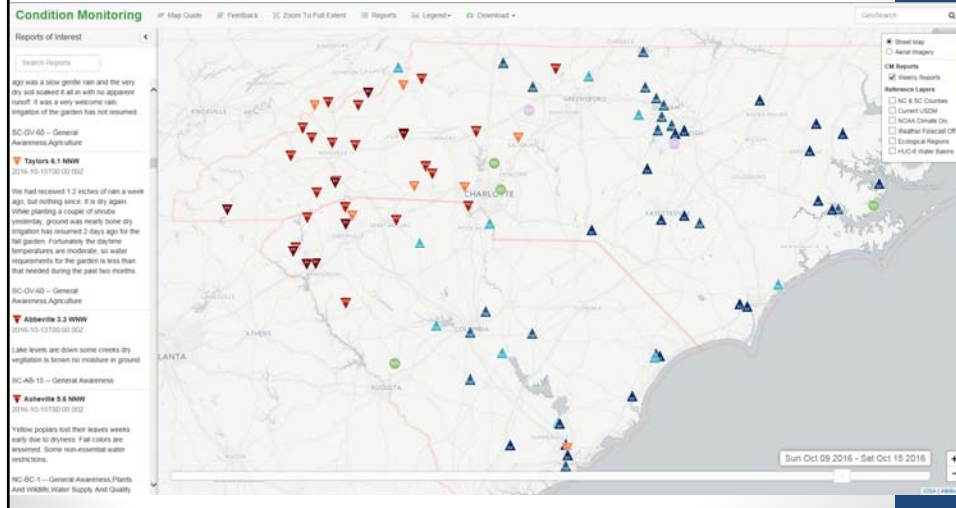
Report Categories
 Please check at least one report category. If you check a category, please provide supporting information in the description. [More information on condition monitoring categories.](#)

- General Awareness
- Agriculture
- Business And Industry
- Energy
- Fire
- Plants And Wildlife
- Relief Response
- Society And Public Health
- Tourism And Recreation
- Water Supply And Quality

Submit Data Reset

Condition Monitoring Web Map

www.cisa.sc.edu/map



Next Steps

- Volunteer recruitment and engagement
 - Communications
 - Online feedback surveys
- Report analysis
 - How do volunteer scale bar selections compare to other, objective drought indices
- Decision maker feedback
 - Utilize the web map through the spring and summer
 - Share feedback about how the information may have been useful
- Going national
 - Report form available to all CoCoRaHS observers throughout the U.S.
 - National web map under development
 - Regional scale bar guidance

Interested in Contributing or Providing Feedback?

- Sign up as a CoCoRaHS Volunteer
 - Visit www.cisa.sc.edu/cocorahs.html to learn more about the project
 - Training and educational materials
 - Volunteer information form
 - Sign up to be a CoCoRaHS volunteer at www.cocorahs.org
- Web Map Evaluation
 - Access the web map and view condition monitoring reports
 - Participate in a follow-up conversation to let us know how you used the report information

Thank You!

Questions or Comments?

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