



NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM COASTAL CAROLINAS DROUGHT EARLY WARNING SYSTEM

WHAT CAN CITIZEN SCIENTISTS TELL US ABOUT DROUGHT?

Using the CoCoRaHS Network to Improve Drought Monitoring and Reporting

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Drought impacts data can be used to improve understanding of drought vulnerabilities and to develop and target strategies for drought response and mitigation. Online tools such as the national Drought Impact Reporter provide a valuable repository of drought impacts information. However, observers typically submit one-off impact reports, when drought conditions are severe or extreme, rather than report on a consistent basis which would allow for a better understanding of how and when drought impacts emerge and evolve.

In collaboration with the National Integrated Drought Information System (NIDIS), the National Drought Mitigation Center (NDMC), and the Community Collaborative Rain, Hail & Snow (CoCoRaHS) network, the Carolinas Integrated Sciences and Assessments (CISA) developed an experimental method of drought monitoring and reporting by citizen scientists. This new method of condition monitoring encourages CoCoRaHS volunteers to submit regular reports about the effects of local precipitation on the environment and society, creating a baseline against which to assess change through time (i.e., seasonally, with varying levels of precipitation). It also allows for assessment of the impacts of wet as well as dry conditions, which can help with flood hazard mitigation and other water-related impacts.



SAMPLE CONDITION MONITORING REPORTS

While we have had a LOT of rain this year, the last month was NOT – was actually quite hot and dry. The grass in the yard is dry, yellowed, and brittle; the plants are drooping; and some tree leaves are already falling (that might just be semi-typical; not sure). Folks who irrigate yards have been doing so. Ironical that when the rest of the country was in drought, we were drowning in rain; and now other parts of the country are flooded and we have dried out. We did get a fifth-inch of rain last night, and Hurricane Hermine is coming in, expected to dump several inches in a few hours this pm.

Wake County, NC, September 2, 2016

Finally, T.S. Hermine gave us some much needed rain! 4.84" and we also received another .75" on top of that! All of the vegetation is loving it, but our lagoon levels are still down. July and August saw over a 7" deficit for 2 months. We still need more rain. The rest of this week appears dry with temps in the low 90's and not as much humidity. Evapotranspiration will be high.

Beaufort County, SC, September 5, 2016

What is a Drought Early Warning System (DEWS)?

A NIDIS DEWS utilizes new and existing partner networks to optimize the expertise of a wide range of federal, tribal, state, local and academic partners in order to make climate and drought science readily available, easily understandable and usable for decision makers; and to improve the capacity of stakeholders to better monitor, forecast, plan for and cope with the impacts of drought.

What is the Coastal Carolinas DEWS?

A diverse group of stakeholders convened in August 2012 in Wilmington, NC, to identify issues of concern about drought in the coastal regions of the Carolinas. Out of the meeting came the Coastal Carolinas Drought Early Warning System, a collaborative federal, state, and local interagency effort to improve early warning capacity and resilience to drought. CC DEWS activities focus on improving the understanding of drought's effects on coastal environmental resources and developing information to enhance drought monitoring and planning processes.



MORE INFORMATION can be found at www.cisa.sc.edu/CoCoRaHS.html.

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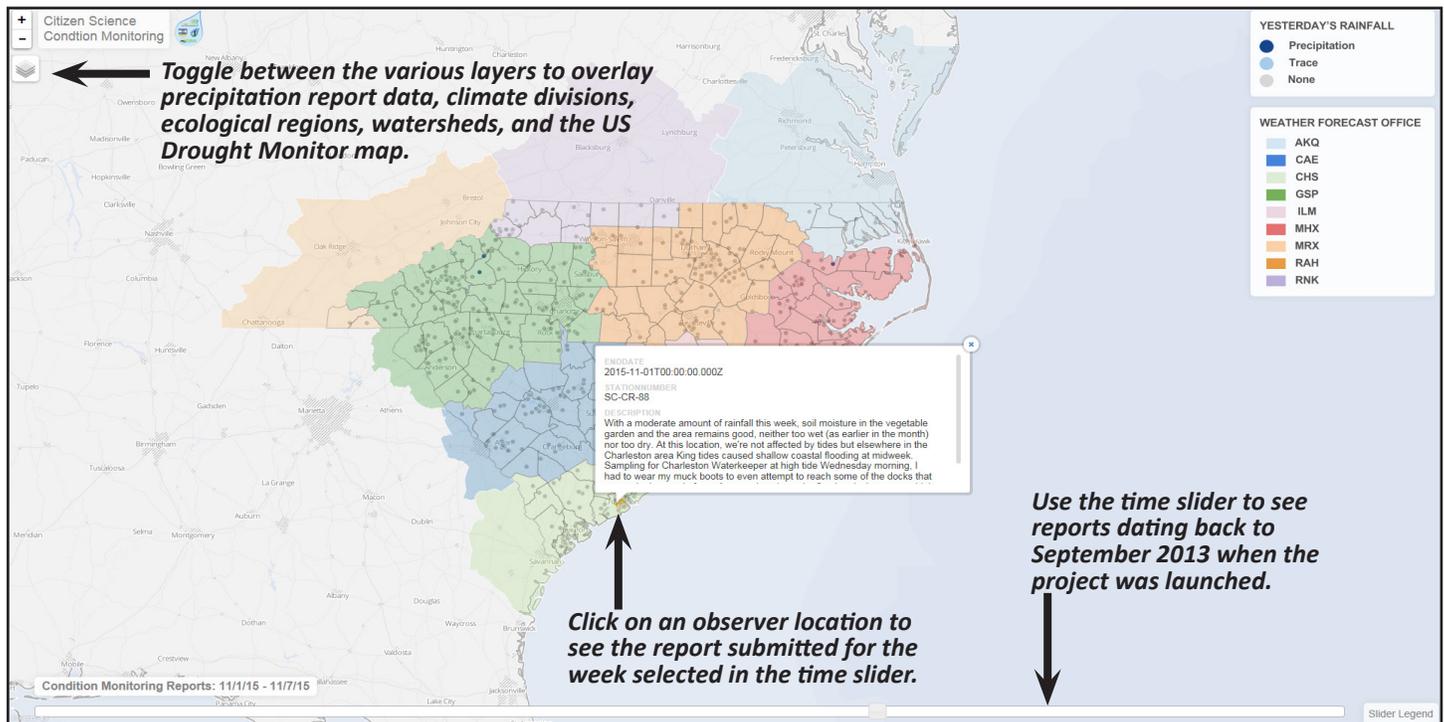
Between September 13, 2013 and December 31, 2015, CoCoRaHS observers in the Carolinas submitted 1,572 reports condition monitoring reports. CISA researchers analyzed report content according to drought impact categories and other variables of interest, such as spatial scale.

Interviews were conducted with representatives from the North and South Carolina state climate offices and drought committees, the CoCoRaHS national office, the National Drought Mitigation Center, National Weather Service Weather Forecast Offices, and county-level soil and water conservation districts. From these interviews, CISA researchers learned how the information might be incorporated into drought monitoring and related decision making. Feedback revealed that, although the qualitative reports are perceived as useful, there is a need for improved accessibility to the information and a quantitative metric to more quickly assess changing conditions.

This has led to a revised reporting format which includes a quantitative metric to supplement the qualitative reports. Observers select from one of seven categories indicating how wet or dry conditions are in their area.

Additionally, a web map has been developed to spatially display reports in conjunction with other decision-relevant information (e.g., precipitation measurements, current US Drought Monitor map, etc.).

Left: Drought decision makers, CoCoRaHS observers, and computer-use experts were consulted in determining the type of scale bar to develop (radio buttons vs. sliding scale) as well as the appropriate number of categories to represent levels of wet and dry conditions. Ultimately, it was determined that seven categories provide the appropriate balance to allow for clear choices for the observers as well as useful information for decision makers. Links to guidance documents are also provided on the report form as additional support for observers in selecting the most representative category on the scale bar and entering useful information in the description box.



Above: The interactive web map allows users to view condition monitoring reports by clicking on the observer location. The observer location is represented by a dot of the same color as the level of wetness or dryness selected for that week's condition monitoring report. A time slider at the bottom of the screen provides access to the reports in one week increments. Users can toggle between layers to view additional layers of precipitation data, the US Drought Monitor map for the selected week, or geographic boundaries such as counties.

Access the Web Map
www.cisa.sc.edu/map