

QUARTER 4

DECEMBER, 2019

CAROLINAS CLIMATE CONNECTION

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Photo Source: Jacob Ramthun



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**L I N D A
R I M E R**

A FOND FAREWELL TO RETIRING CISA COLLEAGUE

Leader, champion, cheerleader, and friend. Just a few words to describe Linda Rimer, a well-known name in the Carolinas and long-time supporter of the CISA program. Over the years, both in her positions with EPA and in her stewardship work, Linda has been a central hub in our network of climate adaptation practitioners and a strong advocate for always “asking the climate question.”

Linda is retiring this month. So, we wanted to take a moment to send a heartfelt Thank You to her for all the work she has done over the years to move the ball forward on climate resilience in the Carolinas and beyond.

Best wishes for a happy, well-deserved retirement Linda!

Cheers,
Your friends at CISA

ELIJAH CHARETTE

CISA FEATURED RESEARCHER



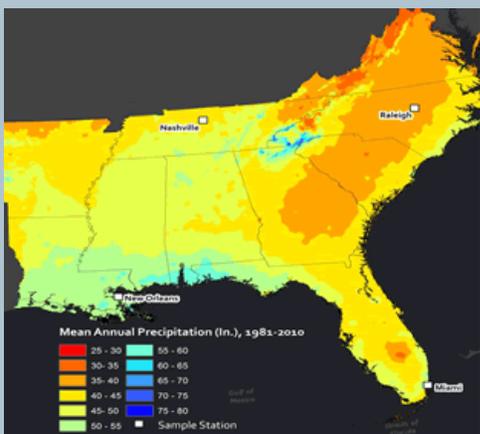
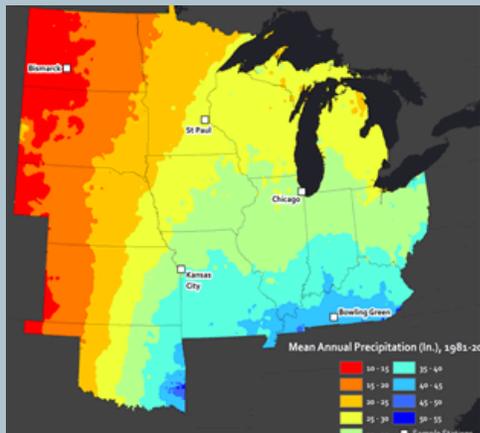
Elijah grew up in New Philadelphia, Ohio. He attends the University of South Carolina where he is pursuing a BS in Environmental Science with a minor in Marine Science. He plans to attend graduate school in the Fall of 2021 to work towards a master's degree. His research interests include island hydrology and coastal erosion and how these processes will impact island communities.

Elijah began working with CISA in February 2019. Currently, Elijah is working on expanding the Hazardous Extremes Risk Assessment (HERA) tool to South Carolina. HERA supports community planning for extreme weather events and impacts. When not working, Elijah enjoys supporting the Pittsburgh Penguins hockey team, skateboarding, and playing music.

CITIZEN SCIENCE DROUGHT MONITORING

New Regional Guidance Supports the Continued Success of CoCoRaHS Condition Monitoring

As part of our work to continue to support the CoCoRaHS Condition Monitoring program, the CISA team recently released new Regional Condition Monitoring Guidance Documents.



What is Condition Monitoring?

In addition to their daily precipitation measurements CoCoRaHS volunteers submit weekly reports which describe recent weather conditions and how they may have impacted the local environment or community. Observers select one of seven Condition Monitoring Scale Bar categories, from severely wet to severely dry, to indicate how conditions compare to what is normal for their area. They also provide qualitative reports with a description of local conditions. Regular reporting is intended to help users, such as state drought response committees, compare conditions and changes over time. Reports can be accessed on the [interactive condition monitoring web map](#). Since the project was launched nationally in October 2016, over 49,000 reports have been submitted by more than 4,400 observers throughout the United States.

Why is regional guidance needed?

Regional Guidance is intended to make condition monitoring easier for observers and demystify the process of qualitative observation. Region-specific suggestions about impacts can help observers recognize secondary and tertiary effects of weather and climate events, letting them create more detailed and relevant content. Greater clarity about thresholds can help them categorize their reports more consistently, enhancing end-user's ability to compare reports between locations and time periods.

The Regional Guidance Document is broken down into several elements:

Regional Background provides information to help volunteers understand what is “normal” for their region. Our new regional guidance assigns states to regions with similar climate characteristics, landscapes, and weather drivers. A regional map shows annual precipitation amounts. Climographs from several cities in the region depict representative monthly temperature and precipitation averages.

Reporting Reminders provide a few helpful tips, such as encouraging observers to use the “severely” wet and dry categories sparingly. For drought periods, observers are reminded to think about long-term conditions (over weeks to months) as drought events typically do not end with a single rainfall event. For wet periods, observers are asked to provide notes on specific storm events as well as longer-lasting effects from rainy weather.

Reporting Guidance instructs observers on how to select a representative wet, dry, or normal category from the condition monitoring scale bar. Examples of different types of impacts were drawn from previously submitted Condition Monitoring reports and the National Drought Mitigation Center’s Drought Impact Reporter. The impact tables are non-exhaustive and should serve only as a guide by which observers may learn to better recognize potential impacts of precipitation or the lack thereof.

Because the condition monitoring process is subjective and broad, volunteers may find it difficult to assess how much information to include or which observations are meaningful to end-users. Even evaluating precipitation conditions on the Condition Monitoring Scale Bar might feel like a difficult decision; if my town always gets a lot of rain in the spring, should I report it as “Wet” or “Near Normal?” How do I distinguish between “Moderate” and “Mild?” Condition monitoring reports are valuable because they are open-ended, but this aspect may also serve to make the process confusing or daunting for volunteers. The Regional Guidance was designed to help both observers and end-users by standardizing and simplifying the process.



Photo Source: Rick Mullin

COLLABORATIONS WITH THE STATE CLIMATE OFFICE OF NORTH CAROLINA

The State Climate Office of North Carolina (SCONC) is one of CISA's key partners. We collaborate on various research projects, develop climate decision support tools, and organize stakeholder engagements. Additionally, SCONC team members serve on the CISA Advisory Committee and Carolinas Climate Resilience Conference planning committees. Leveraging each other's resources and expertise allows us to increase our collective capacity to support climate resilience in the region. Here we highlight two projects, led by the SCONC with support from CISA, to improve drought planning and preparedness in the Carolinas.

Organic Soil Moisture Monitoring in Coastal North Carolina

The State Climate Office of North Carolina (SCONC) leads the Organic Soil Moisture Monitoring project with support from CISA and the National Integrated Drought Information System (NIDIS). The organic soils found in the coastal Carolinas have historically hosted numerous large, long-lived wildfires. The soils in eastern North Carolina are highly variable in their characteristics, making it very difficult to estimate moisture content. The purpose of the Organic Soil Moisture (OSM) Monitoring project is to provide real-time soil temperature and volumetric water content data to help monitor and manage the risk of fire in the coastal area.

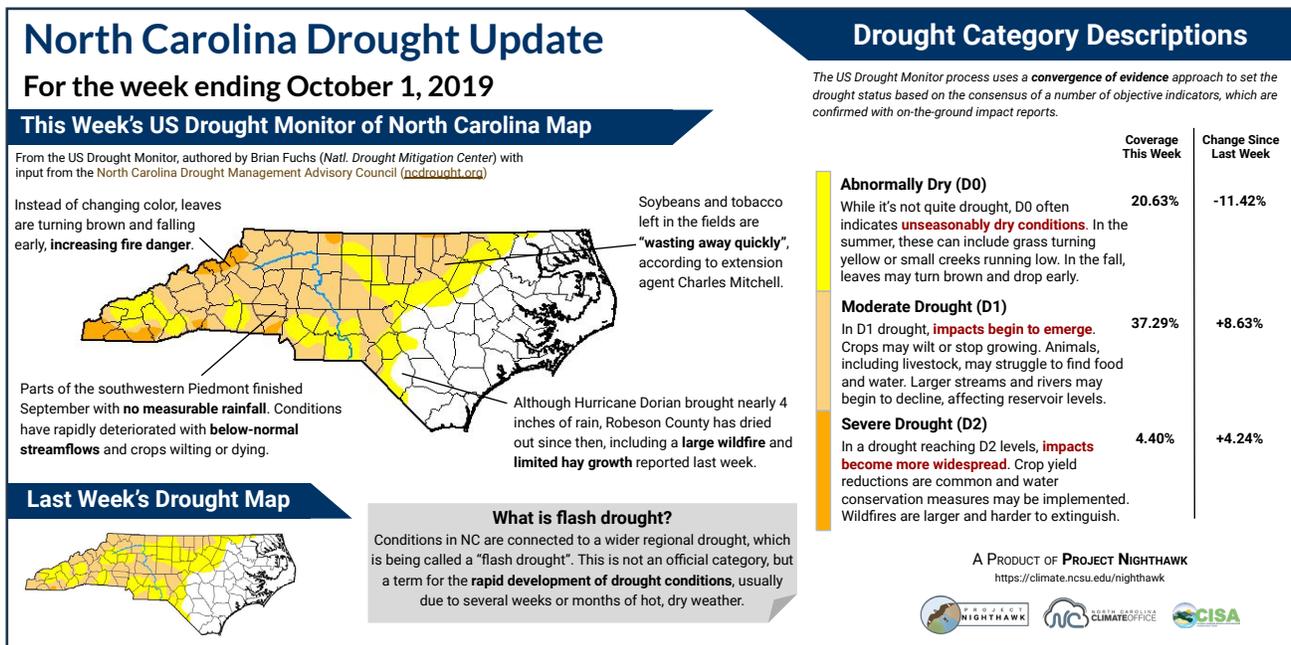
In 2018-2019 the SCONC installed four OSM monitoring stations in eastern North Carolina. The stations are located at Lake Phelps, Pocosin Lakes, Dismal Swamp State Park, and Green Swamp Preserve. At each location, three columns of sensors are buried at depths of 5, 10, 20, 50, and 100 centimeters. The soil moisture recordings from the three columns are averaged together to provide a more accurate soil moisture for each location. The OSM data is currently being used to monitor soil moisture changes at different depths, assess the benefits of land restoration for decreasing fire risk in organic soils, and evaluate the smoldering potential in these soils. This data can be accessed through the [Fire Weather Intelligence Portal](#), an online tool developed by the SCONC.

The Nature Conservancy and the US Fish & Wildlife Service are using the data to help evaluate their restoration work at the Pocosin Lakes National Wildlife Refuge. By comparing observations between the two monitoring stations on the refuge -- one on a restored block, and one on an unmanaged one -- they can assess the effectiveness of the restoration on the water table height and fire and smoke risks.

For more information: Participants at the [2012](#) and [2016](#) Coastal Carolinas Drought Early Warning System (DEWS) planning meetings identified needs for improved indicators and tools to monitor and communicate drought in coastal areas. In 2014 the SCONC conducted an [assessment](#) of available drought indicators for coastal zone fire risk. Study findings suggested that an on-the-ground monitoring network, such as the OSM monitoring project described here, could aid the development and use of remotely-sensed data for drought monitoring. Go to the "Fire in the Coastal Carolinas" [story map](#) to learn more about areas with peat soils and coastal locations that have recently experienced wildfires.

Project Nighthawk: Innovating Approaches to Drought Communications with North Carolina Decision Makers

Project Nighthawk focuses on improving the usability of drought-relevant information for groups such as the North Carolina Drought Management Advisory Council (NC DMAC), Cooperative Extension agents, and public water systems. An overview of the project is provided here by Anisha Gupta and Emily Foster, undergraduate research assistants from North Carolina State University who have helped develop the new drought resources they describe in the article. These include a **story map** about the NC DMAC weekly monitoring process and the example infographics shown here. This project is funded by the NOAA Sectoral Applications Research Program (SARP), in support of the National Integrated Drought Information System (NIDIS) and efforts to enhance decision making through improved and varied communication techniques.



Example Project Nighthawk Drought Infographic produced for the NC Drought Management Advisory Council

Communication, statistics, and meteorology often go hand in hand, whether it's in the weather forecast on the nightly news or when sharing research results about weather observations and analysis. As undergraduate research assistants at the State Climate Office of North Carolina, we've had an amazing opportunity to grow as communicators and experience research in a hands-on environment through Project Nighthawk.

North Carolina and its neighbors have historically experienced the effects of drought with impacts in the agriculture, forestry, and water resources sectors. Notable events within the past two decades led stakeholders to express the need for improved drought information and communications. The State Climate Office of North Carolina and CISA are collaborating on a NOAA-funded grant that began in 2018 intending to improve how existing drought information is communicated and disseminated within North Carolina. This effort was soon dubbed "Project Nighthawk" after a native bird species that is especially resilient to drought.

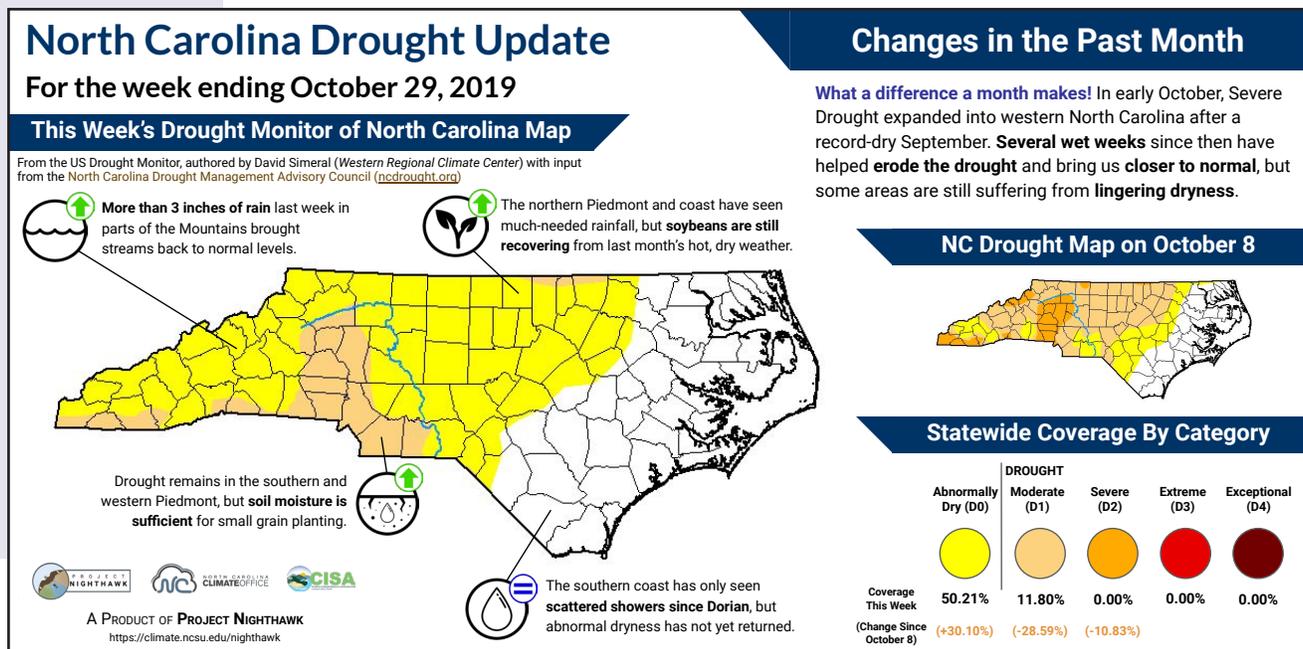
The first phases of Project Nighthawk included cataloging existing information needs, frequently used sources of information, and preferences for receiving information from our target stakeholders. We also began the development of new infographics that tailor drought-related information to our target sectors. These included a short-range outlook product to describe weather and climate patterns over the coming weeks and how drought conditions may change.

As summer heat and drought impacts emerged beginning in May, we focused on another project priority: developing resources that communicate changes in the state's weekly drought status and the information examined by the NC Drought Management Advisory Council. This infographic, as well as our short-range outlook, continues to be published regularly and shared with representatives from our target sectors.

To evaluate how well these resources met decision-maker needs, we obtained feedback during in-person workshops with Cooperative Extension agents and the North Carolina Fire Environment Committee, and we conducted eye tracking studies at the Water Resources Research Institute Conference and the NC State Extension Conference in 2019. By working first-hand with stakeholders, we have created targeted products that make them, their colleagues, and their communities better informed, and we have gained a true appreciation for the benefits that can be achieved at the intersection of research, communication, and applied science.

As the year comes to a close, we are excited to use the skills and knowledge we have learned on Project Nighthawk to create our own eye tracking research poster and present it in the spring. Working in the State Climate Office as undergraduates has proven to be a valuable experience, and participating in conferences, learning new skills, and making connections has prepared us for our future careers better than any class could.

By: Anisha Gupta and Emily Foster



Example Project Nighthawk Drought Infographic produced for the NC Drought Management Advisory Council