

2019 South Carolina Drought Tabletop Exercise Report Summary

July 24, 2019 | South Carolina Emergency Operations Center | West Columbia, SC

Motivation and Goals

South Carolina has experienced several droughts over the past two decades, highlighting the need for multiple agencies and organizations to work together to effectively manage water resources during these events. Formal plans and processes are important tools for water managers and users as they collectively monitor, conserve, and manage water resources during drought events.

The goal of the exercise was to enhance South Carolina's drought response and preparedness and the State's capacity to address water shortage emergencies due to drought. Specific objectives were to:

- Simulate the South Carolina drought monitoring and response process
- Identify gaps in existing processes and prioritize follow-up actions
- Increase awareness of participants' roles and responsibilities for drought response and planning within their agencies and organizations

Participants

South Carolina's second statewide drought tabletop exercise convened 92 participants from 48 different organizations.

Attendees represented the water, energy, agriculture, and emergency management sectors. Participants learned about their roles and responsibilities for drought response, reviewed drought preparedness and response actions, and identified areas for improvement.

Participant Feedback

"We need more communication between drought response entities, and more exercises like this. Thanks for organizing it!"

"This being my first year on the (Drought Response) Committee and my first year attending the exercise, the best thing I learned was the basic structure of the different organizations and put faces with names which is still important even in the digital world we live."

Planning Team

State Climatology Office, South Carolina Department of Natural Resources
Carolinas Integrated Sciences and Assessments, University of South Carolina
South Carolina Emergency Management Division
South Carolina Water Resources Center, Clemson University



Format

1. The **Introduction** provided participants with an overview of the relevant legislation, plans, and programs that formed the basis of the exercise.
2. Participants walked through **four hypothetical drought scenarios**, reviewing the actions that would occur at the moderate, severe, and extreme drought phases and during activation of the Drought Response Plan. The scenarios provided a plausible set of deteriorating conditions and impacts over a two-year period. Breakout groups in the severe and extreme drought scenarios allowed for more interactions and in-depth discussions among participants.
3. The concluding **Hot Wash** facilitated an “after-action” evaluation of the exercise. An online, **post-exercise survey** gave participants another opportunity to provide feedback about the event and any additional drought response concerns to be considered.

Each scenario consisted of the following elements:

- **Drought indicator values, maps, and other visualizations** replicated the information typically presented at Drought Response Committee (DRC) meetings and calls.
- Photos and other visuals demonstrated **typical impacts** for each drought alert phase. (Fig. 1)
- **Response actions** followed those outlined in South Carolina’s Drought Response Act and Regulations. As the drought scenarios progressed, local water systems required mandatory water conservation, and the DRC recommended the curtailment of nonessential water use. In the final scenario, imminent water shortage emergencies necessitated the activation of Drought Response Plan. (Fig.2)
- **Discussion questions** stimulated dialogue about the strengths and weaknesses of existing plans and procedures, communications mechanisms, and response actions.

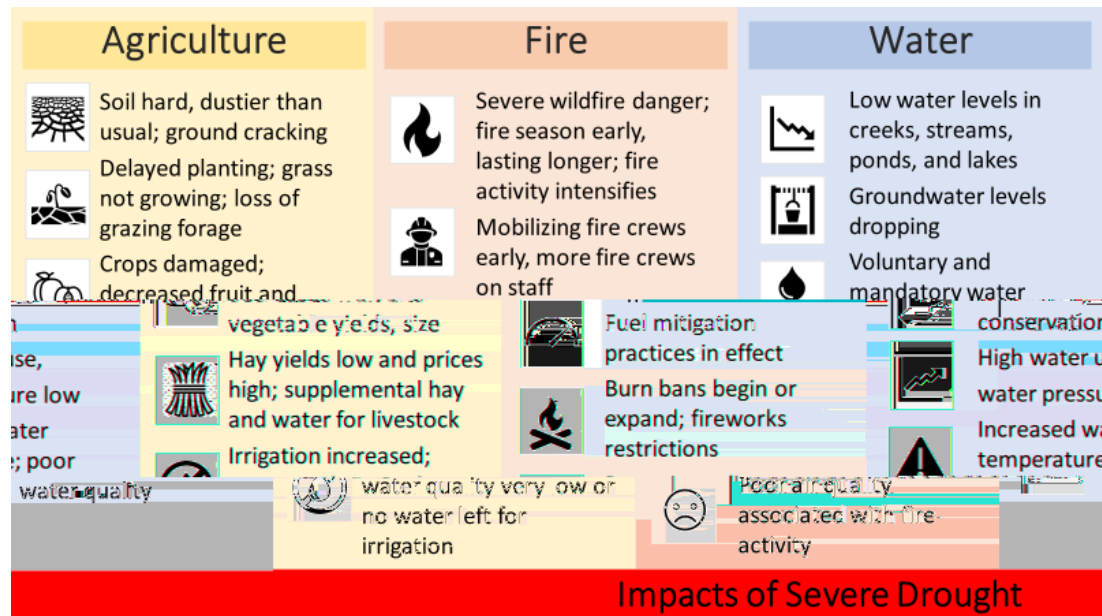


Figure 1. Example impacts for South Carolina during the Severe Drought Alert Phase. (Information adapted from the National Drought Mitigation Center’s Drought Impact Reporter database)

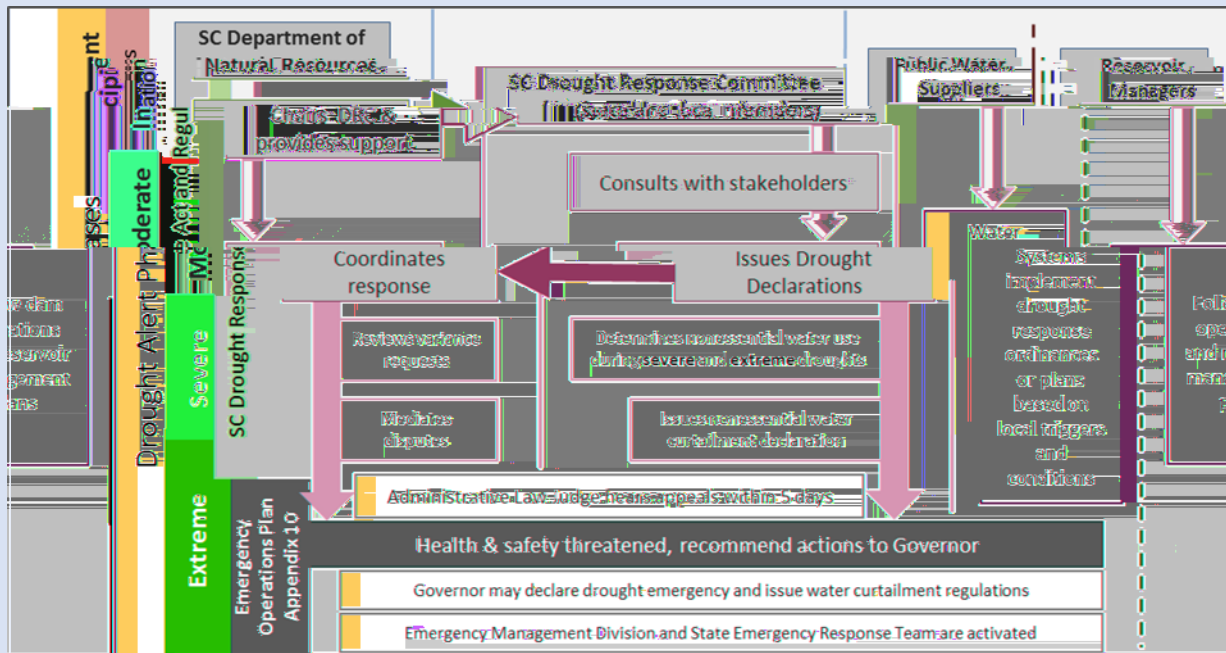


Figure 2. Components of South Carolina’s drought response process.

The flowchart shows responsibilities and actions at successive drought phases:

- The Drought Response Act and Regulations establish the four drought severity levels and the indicators and quantitative measures that correspond to each level, describe the DRC’s responsibilities, and require public water suppliers to develop drought plans and ordinances.
- The DRC evaluates drought indicators and determines county-level drought status; consults with stakeholders; and decides when drought conditions warrant measures beyond the scope of local action, including mandatory water use reductions, curtailment of non-essential water use, and activation of the South Carolina Drought Response Plan.
- The South Carolina Drought Response Plan is located in the State’s Emergency Operations Plan (EOP), Appendix 10, and is implemented by the South Carolina Emergency Management Division. It may be activated when drinking water supplies are at risk of being depleted; public health, safety, and welfare are threatened; and/or when state-level resources are necessary to alleviate impacts.
- In many of South Carolina’s river basins, management plans and Low Inflow Protocols (LIPs) provide the triggers and actions to guide hydropower operations and reservoir releases during drought.

Participant Feedback

“The holistic approach at a state level was great to learn about actions and plans of those in other basins. Coordination at the basin level also seems extremely important - and the tabletop exercise provided a nice balance between state and basin coordination.”

“The resources and points of contact available were invaluable. Will note these in our plan. Documented several improvements to incorporate into our plan – revise triggers and communication templates to customers.”

Key Themes and Observations

Drought is a complex hazard, making planning and communications a challenge.

Participants voiced concerns that many entities are unaware of the State's drought legislation and regulations and that many local plans and ordinances are not up-to-date. As the State's Drought Response Act, Regulations, and guidance for local plans and ordinances were last updated in 2000-2001, reviewing and updating the Act and Regulations is necessary to ensure that South Carolina's process is relevant and adequate to address changing circumstances and new information.

Furthermore, there is often confusion about monitoring processes and maps, such as the differences between the U.S. Drought Monitor map and the South Carolina drought map developed by the DRC. It is particularly challenging to communicate about lagging indicators and impacts. For example, groundwater tends to respond more slowly to drought conditions than surface water. The agriculture sector is typically affected before drinking water supplies, but some water systems may not experience any adverse effects even at the severe and extreme drought phases.

A full Drought Response Committee can facilitate information sharing with affected sectors, communities, and organizations and help ensure that different stakeholder groups are represented adequately.

Participants asked whether all relevant sectors and interests have adequate input to, and representation at, different phases of the response process, particularly as many DRC seats are currently vacant. Many participants noted that more should be done at earlier stages of drought to help agricultural producers and other affected water users respond to and prepare for impacts. Earlier involvement of local-level emergency managers and members of the State Emergency Response Team (SERT) in the process will allow those agencies to identify potential water

shortage emergencies rather than waiting until activation of the EOP.

Exercise participants noted three key challenges associated with the implementation of state-level response actions as established by the Drought Response Act and Regulations.

- ***Transitioning between Drought Alert Phases:*** Participants expressed uncertainty regarding how the transitions into increasingly severe levels of drought (i.e., severe, extreme, and activation of the Emergency Operations Plan) would be implemented in practice. Current plans lack clear procedures to guide when and how SCEMD personnel, local-level emergency managers, and federal entities and regulators would become involved. It is unclear if this involvement can only be initiated through the Governor's emergency declaration or if other triggers and/or requests from the DRC can launch additional assistance and response actions at the severe drought phase.
- ***Curtiling water use:*** During an extreme drought, conditions may necessitate that the DRC assess the effectiveness of voluntary water use reductions and recommend mandatory water restrictions. Participants raised many challenges associated with the determination, prioritization, and restriction of non-essential uses. No specific criteria exist to guide such an assessment, and it is unclear how the economic costs of restrictions and emergency measures will be considered. For example, non-food agricultural production currently takes higher priority over uses such as energy generation, yet any curtailment of energy production will likely affect the overall economy and public safety. Manufacturers already efficient in their water usage may not be able to curtail their water use without suffering major economic losses. Larger water utilities may face difficulties in reducing water

use, if smaller utilities and well users turn to them when their water resources are depleted.

- **Enforcing water use restrictions:** The enforcement of drought restrictions and water use curtailment poses challenges particularly during the severe and extreme drought phases. The ability for different local, state, and federal agencies to enforce water use reductions, or take other response actions, is uneven. Although the DRC may recommend mandatory conservation and water use curtailment when conditions warrant, there is no statewide enforcement capability, and individual agencies may not be able to implement many activities until the Governor makes an emergency declaration. On the local level, enforcement measures vary considerably between local water utilities and communities.

Many organizations produce and disseminate drought information, including local, state, and federal agencies; water utilities; and volunteer and non-governmental organizations.

Communications (both the messages and the mechanisms used to disseminate information) are often inconsistent or uncoordinated between the various entities that provide drought information. This can cause confusion when an area has multiple water utilities, different customer bases, and a variety of water uses and preferred response levels (for example, voluntary or mandatory restrictions). The public may not know exactly which messages pertain to them.

Affected groups often do not have access to adequate resources to respond to drought impacts.

Participants raised questions about how best to assist water-dependent sectors, water users, and

other entities that suffer disparate impacts and have varying capacities to respond. For example, larger organizations and water systems are likely to possess adequate personnel and resources to plan and disseminate timely information, but it is unclear whether smaller organizations and rural communities have similar capacity and how to ensure they receive needed assistance. Some state and federal agencies, as well as non-profit organizations, may not have the resources or authority to provide aid and assistance to those who are affected unless certain criteria are met.

More reliable and regularly collected impacts data can improve understanding of the full costs of drought and enhance the effectiveness of drought monitoring, response, and planning activities.

Participants discussed limitations of current data availability and understandings of drought. This includes a lack of systematic efforts to track or assess who or what is affected by drought, how different entities respond, and the economic costs associated with various impacts and response actions.

Education is critical for increasing understanding about drought, its impacts, and how to prepare and respond.

Participants noted that professionals and agency staff responsible for water management and/or drought response would benefit from greater familiarity with South Carolina's Drought Response Program and the procedures outlined in the Drought Response Act and Regulations. Participants also noted a need for more educational resources to promote drought understanding and awareness for general and K-12 audiences.

Recommendations: Build On Existing Capacities and Resources

Recommended action items discussed during the exercise and in the feedback survey are listed here. Suggestions range from very specific and tangible (i.e., fill DRC vacancies) to longer-term commitments to policy changes, engagement with the multiple entities affected by drought and involved in drought response, and research efforts to improve understanding of drought events and their impacts. While these recommendations are envisioned for Drought Response Committee members and state agencies with direct drought response responsibilities, they will require collaboration with partners from government, academia, and the private and non-profit sectors.

Drought Response Committee Representation and Involvement

- For SCDNR and the State Climatology Office, continue to work with the Governor's office on making new appointments and filling DRC vacancies.
- Identify methods to enhance the exchange of information between DRC members and their Drought Management Area constituents, to ensure that clear lines of communications are established before a drought event.
- For the DRC, engage with affected sectors and agencies earlier in the drought monitoring process. Pay more attention to conditions during spring and early summer, when water demand is high and agriculture may be most vulnerable to dry conditions.
- Involve county emergency managers and/or State Emergency Response Team (SERT) members in DRC calls and meetings as areas move into severe and extreme drought.
- Connect with Georgia and North Carolina at early stages of drought, as the impacts experienced by our neighbors, and how they respond, will affect South Carolina's water resources.

Plans and Procedures

- Review and update the Drought Response Act and Regulations. Specific components discussed at the exercise included the procedures to transition between Drought Alert Phases, determine and curtail non-essential water use, and enforce mandatory water use restrictions.
- Support and encourage local planning efforts. This could include updating the State's local drought plan and ordinance guidance document and encouraging utilities and communities to periodically review their plans and any factors that may affect their plan's effectiveness. Identify groups (for example, Councils of Governments or professional associations) to help work with local entities to update their plans and/or conduct tabletop exercises to assess local drought response capacities.
- Include other organizations and groups who were not present at the exercise and/or are not currently involved in the State's drought response process in future conversations about drought response and planning. Suggestions included elected officials, professional news media, industries and manufacturers that use wet processes, neighboring states, and other state agencies such as the Departments of Insurance; Employment and Workforce; Labor, Licensing, & Regulation; and Parks, Recreation, and Tourism.
- Integrate drought policy and planning into broader state water plan and upcoming river basin planning processes.

Data and Information

- Promote and expand the collection of local impact reports, using resources such as the National Drought Mitigation Center's drought impact reporting app, a tool that allows users to submit short descriptions of how drought is affecting their location.

- Conduct research to improve understanding of the transitions between different drought phases and identify critical thresholds. Use this information to develop resources to better explain and communicate the cascading effects of drought and what conditions to expect at different time scales and different times of the year.
- Identify data sources and most effective methods to better monitor water supplies. This may include information about intake locations in relation to water levels, which populations are most affected by a potential water shortage, and interconnections (i.e., which systems and/or communities may be able to share water supplies).
- Identify data sources and most effective methods to collect information about the economic and monetary costs experienced by the wide range of sectors and activities affected by drought.

Communications

- Continue to use the scdrought.com website as the primary platform for sharing information about drought conditions. Build on currently available content, with the goal of helping South Carolina's citizens be more aware of and better prepared to respond to drought. This could include developing new, or enhancing existing, resources for farmers, water customers, businesses, elected officials, and the public.
- Review existing communications to ensure that messages are clear, concise, timely, and consistent. Evaluate drought messages and

communications tools to better understand how recipients perceive, understand, and apply drought information, with the goal of improving future communications.

- Explore opportunities to leverage other tools and networks that currently exist. Suggestions include greater use of social media, mobile apps, broadcast meteorologists, Clemson Extension, the SCEMD emergency alert system, and National Weather Service offices. Develop communications procedures, similar to those used by SCEMD during emergency operations, and messaging examples that can be used by different types of organizations at different drought severity levels.

Education and Awareness

- Conduct regular statewide tabletop exercises (every 1-2 years) to promote awareness of drought plans and networking between drought response entities.
- Develop tools and resources to inform and educate different audiences about drought when conditions are not at severe or extreme levels. Adapt user-friendly formats such as the pamphlets produced for other hazards.
- For the agriculture sector, work with Clemson Cooperative Extension to develop materials about South Carolina's drought response plans and procedures for producers and identify the most effective way(s) to disseminate this information.
- For water utilities, collect and publicize lessons learned about drought response from South Carolina utilities and communities.

Online Resources

Materials from the 2017 and 2019 South Carolina Drought Tabletop Exercises are available on the South Carolina State Climatology Office and Carolinas Integrated Sciences and Assessments (CISA) websites.

<http://scdrought.com/>

https://cisa.sc.edu/projects_drought-response.html