Southeast Climate
EXTENSION | Advancing Climate Extension in Agriculture

"Any party which takes credit for the rain must not be surprised if its opponents blame it for the drought."

Dwight Morrow



Drought in the Southeastern U.S.

Agricultural and Hydrologic Drought

Key Points

- Drought is a natural part of the climate cycle.
- Agricultural drought is a short-term deficit of water, often caused by high temperatures or extended rain-free periods, which can develop quickly and usually has its maximum impact during the growing season.
- Hydrologic drought is a long-term deficit of water over several seasons that results in decreases in lake and reservoir level, low stream flows, and depressed groundwater levels.
- In the Southeast, drought is often triggered by La Niña or lack of tropical storms.

What is a drought?

In its most basic form, drought is simply the lack of enough water to meet the needs of water users. The water shortages associated with drought can come from lack of adequate rainfall, long dry spells with no significant rain, or enhanced evaporation due to abnormally high temperatures. Droughts are a natural part of the climate system, and many plants and animals are adapted to periods of dry weather; unfortunately, these dry conditions can negatively affect agriculture if they occur during vulnerable growth periods. Drought is primarily measured by its impacts on water resources, agriculture, and ecosystems; as long as water needs are being met, droughts are often overlooked.

Agricultural drought

Drought that affects farms and farmers is often characterized as *agricultural drought*. Agricultural drought is generally drought that develops over a short time period, often during the growing season. Lack of soil moisture and high temperatures frequently associated with drought can cause stress on plants. This type of drought is particularly consequential when it falls at sensitive times in the life cycles of crops, such as the period of corn pollination.

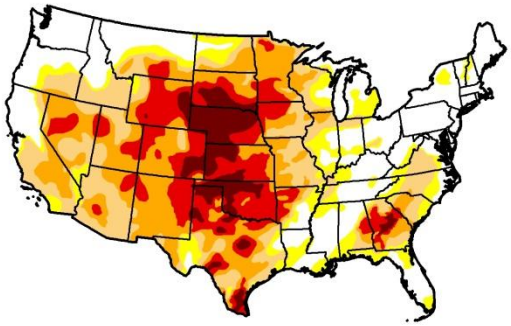


Figure 1. National Drought Monitor, extent of drought in the US on 1/1/2013. (Credit: NOAA).

USDA United States Department of Agriculture National Institute of Food and Agriculture

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Occasionally, an agricultural drought appears so quickly that producers are surprised by its severe and sudden impacts. This is known colloquially as a *flash drought* because of the sudden, unexpected onset of impacts. Agricultural droughts can come and go quickly, and a single large rain such as the passage of a tropical storm can effectively end a short-term drought in a short time period.

Hydrologic drought

A *hydrologic drought* is a long-term water deficit that can build up over months and years. Generally, hydrologic droughts cause decreases in lake and reservoir levels, groundwater levels, and the base flow of streams, and when severe, can impact supplies of water for cities as well as farmers.



Figure 2. Low lake level on Lake Hartwell in summer 2008 (Credit: Jim Kundell).

Hydrologic droughts may not have significant impacts on agriculture if they develop gradually and rainfall continues, even if at a reduced rate. However, if they are prolonged over several seasons or years, the combined impacts of short- and long-term droughts can devastate crops and cause failure of both crops and pastures. In addition, these droughts can drastically reduce water in farm ponds and streams, in the worst case eliminating water use by irrigation and livestock operations. Hydrologic droughts usually take months to ebb as weather patterns bring above-normal rain to parched areas, but flood events can hasten their departure.

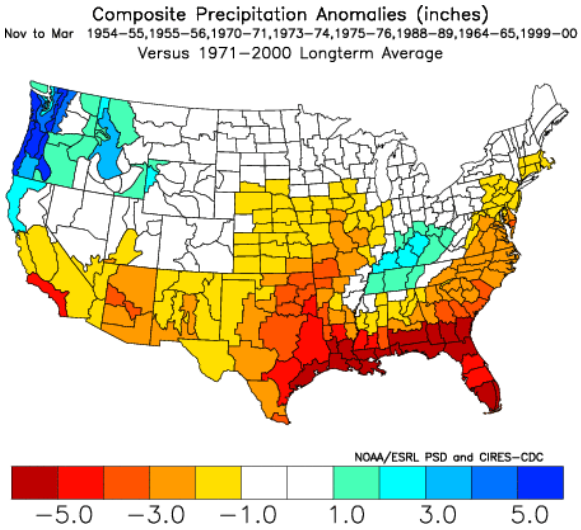


Figure 3. Precipitation departures from normal in La Niña winters (Nov. to Mar.) Credit: NOAA.

Drought in the Southeast

Drought in the Southeast can be caused by a variety of factors. Most commonly, the normal weather patterns that bring storms to the Southeast are shifted so that rainfall is blocked from the region. La Niña is a global weather pattern variation caused by colder than normal water in the Eastern Pacific Ocean. It diverts the subtropical jet stream (which steers rain-producing weather systems) to the north, leaving southern Georgia and Alabama and most of Florida drier than usual; this may trigger a drought. In summer, the Bermuda high may extend from the Atlantic Ocean over the Southeast, blocking the path of tropical storms that normally bring significant amounts of rain in summer and fall.

Resources:

- Drought Outlook: http://agroclimate.org/forecasts/Drought-Outlook/
- U.S. Drought Portal www.drought.gov
- Southeast Climate Center drought links: www.sercc.com/drought

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