

The Historic U.S. Southeast Drought and Implications on Water Resources[©]

J. John Feldt

National Weather Service, Southeast River Forecast Center, Peachtree City, Georgia 30269

Email: john.feldt@noaa.gov

INTRODUCTION

Much of the U.S. Southeast, including Florida, Georgia, Alabama, North and South Carolina, and Virginia, have been in the midst of a historic drought since the winter of 2006. This has been one of the most intense, extensive, and persistent droughts in the U.S. Southeast since modern day record keeping began. While the magnitude and extent of the drought has improved notably in 2008, persistent areas of severe drought continue in many areas.

PRIMARY CAUSES FOR THE HISTORIC DROUGHT

Rainfall replenishes water resources over the Southeast United States over two distinct periods, the winter recharge period, which typically lasts from mid November through early April, and the late summer and fall tropical season. Soil moisture, stream flow, and reservoirs receive critical rainfall during these climatologically-based recharge periods. Of these two periods, the winter recharge period is most critical, and usually the most reliable time for recharge. While the tropical season can bring widespread rainfall, coverage tends to be much spottier from year to year.

Between the winters of 2006 and 2008, all primary recharge periods received well-below normal rainfall. Both winter recharge periods saw well-below-normal rainfall, as did both the tropical season of 2006 and 2007. Thus, the U.S. Southeast missed out on all four primary recharge opportunities over two consecutive years.

IMPACTS

The U.S. Southeast drought likely peaked in 2007. Almost all U.S. Southeastern states reported that 2007 was one of the top ten driest years on record. For North Carolina, 2007 was a record driest year. Widespread stream flow in the lowest tenth percentile, as recorded by the U.S. Geological Survey, was reported over extensive areas. Reservoirs reported critically-low elevations. Lake Lanier in Georgia, which is a water supply reservoir for Atlanta, reported record-low lake levels for over a year.

ROLE OF THE 2008 TROPICAL SEASON

The 2008 tropical season resulted in a more typical number of inland-moving tropical systems. Tropical Storm Fay brought widespread rains to Florida and southern sections of Alabama and Georgia. In Florida, this was on top of an above-average summer rainy season. Consequently, much of Florida went from drought conditions to areas of flooding. Tropical Storm Hanna moved inland and dropped rainfall over eastern sections of North and South Carolina and Virginia.

Tropical Storm Hanna significantly helped alleviate rainfall deficits and drought conditions over eastern sections of North and South Carolina and Virginia. Unfortunately, areas impacted by the most severe drought, including northern Georgia and far western North and South Carolina, missed most of this rainfall.

OUTLOOK

When considering when the drought might end, there are a number of factors to consider.

Climate Signal. Warmer-than-normal equatorial Pacific sea surface temperatures are called El Niño, while cooler-than-normal conditions are called La Niña. Moderate-to-strong La Niña conditions persisted through much of the 2006-2007 drought. However, starting in early 2008, conditions trended back into a neutral range. The latest climate models indicate that neutral or El

Niño conditions will persist for the rest of 2008. El Niño generally results in enhanced rainfall over much of the region, especially southern sections of Georgia and all of Florida.

Length of Past Droughts. Past severe droughts have persisted for about 2.5 years, with the longest nearing 5 years. The current drought is nearly 3-years-old, which makes it one of the longest-lasting droughts on record. Based on past droughts, one might surmise that this drought is entering its latter stage. However, due to recent tropical activity, as well as improving climate signals and a review of the length of past drought, there are some signs for further improvement heading into the winter months.

Key Drought-Related References/Links include:

- NOAA Drought Information Center <http://www.drought.noaa.gov/>
- National Weather Service <http://www.weather.gov>
- National Integrated Drought Information System (NIDIS)
<http://www.drought.gov/portal/server.pt>
- Southeast River Forecast Center <http://www.weather.gov/serfc>
- Advanced Hydrologic Prediction Service (Including Past Observed Precipitation Graphics) <http://water.weather.gov/>
- NOAA's Climate Prediction Center <http://www.cpc.ncep.noaa.gov/>