

Effects of Drought on Hydrologic Conditions in Alabama, 2006-2008

Alabama experienced severe drought conditions from 2006 through 2008. During the peak of the drought, over 50 percent of the state was under a D4 drought classification based on the U.S. Drought Monitor. Surface- and groundwater resources were stressed forcing many municipalities and water suppliers across the state to impose mandatory water-use restrictions. A large number of water suppliers also recommended voluntary restrictions and offered incentives for reductions in water usage.

Mean annual precipitation in Alabama ranges from about 51.4 inches in Muscle Shoals to 64 inches in Mobile based on National Weather Service records from 1970 through 2000. The cumulative 3-year (2006-2008) departure from normal ranged from a negative 18.2 inches in Mobile to a negative 52.9 inches reported at Tuscaloosa. The worst of the drought occurred during the 2007 calendar year when only 62 percent of the normal precipitation occurred statewide based on records from eight National Weather Service stations. In 2007, the departure from normal annual precipitation totaled a minus 29.7 inches at Anniston and minus 31.1 inches in Tuscaloosa representing 42 and 46 percent, respectively, of their normal annual precipitation.

During the height of the drought, hydrologic conditions at all of the long-term stream gaging stations (stations with more than 30 years of record) across the state experienced below normal stream flows. As much as 90 percent of the long-term stations experienced numerous days with flows below the 10 percentile of daily mean flows, and about 40 percent of these stations had flows at all-time lows compared to long-term daily mean discharge values.

During the 3-year period from 2006 through 2008, 5 of 20 selected long-term stream gaging stations set new records for minimum annual mean discharge. All five stations set new minimum annual mean discharges in 2007, and one of those stations set minimum discharge records in both 2007 and 2008.

This presentation will review and summarize the drought conditions during the 3-year period from 2006 to 2008 and particularly focus on the hydrologic effects of the drought as related to river stage and stream flows. The severity of the drought will be assessed by comparing the hydrologic conditions during this drought with historical data.

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