A Comparison of the 1950s Drought of Record and the 2009 Drought, Barton Springs Segment of the Edwards Aquifer, Central Texas

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ABSTRACT

The Barton Springs segment of the Balcones Fault Zone Edwards Aquifer is an important resource for water supply and environmental flows; however extreme droughts can limit the amount of available water. The Barton Springs/Edwards Aquifer Conservation District has developed its drought management policies specifically for a recurrence of the 1950s drought of record (DOR). A comparison was made between the DOR and the 2009 drought using springflow, streamflow, rainfall, and water-level data. Generally, the values of these parameters for the DOR are slightly lower than those during the 2009 drought. The 24-month rainfall total for the 2009 drought was almost the same as the value for the last 2 years of the DOR, 35.2 and 34.8 inches, respectively. However, from a water-budget perspective, there was almost twice the amount of water being discharged (by pumping and springflow) at the end of the 2009 drought compared to the DOR. Several possible explanations for the difference in water budgets between the DOR and the 2009 drought are: (1) the DOR was considerably longer so the amount of water in storage was more depleted; (2) there was a long-term shift to wetter conditions after 1957 leading to more water in storage during the 2009 drought; and (3) increased pumping since the 1950s could have been offset by an increase in flow from adjacent and underlying aquifers, or even urban recharge such as leaking water pipes. However, it is likely that during a recurrence of the DOR, springflow will decrease below rates observed during the DOR owing to higher rates of pumping.

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