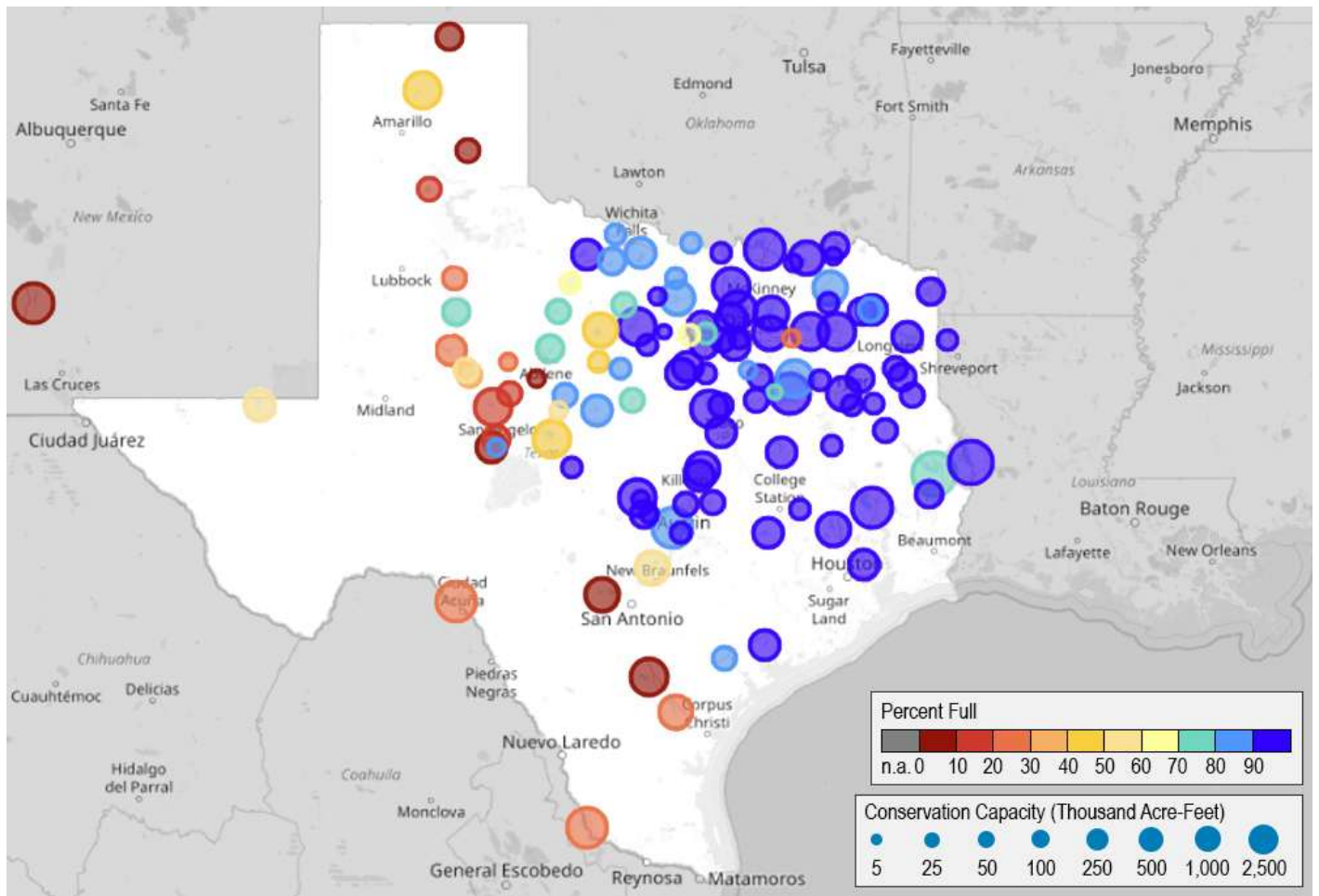


Ask an expert: Reservoir data on Water Data for Texas

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Water Data For Texas is a hub for reservoir statistics

[Water Data for Texas \(https://www.waterdatafortexas.org/reservoirs/statewide\)](https://www.waterdatafortexas.org/reservoirs/statewide)

(WDfT), managed by the Texas Water Development Board (TWDB), serves as the state's central hub for tracking critical water information. The platform brings together real-time data on reservoir storage, aquifer conditions, precipitation, and evaporation to help the public, policymakers, and researchers understand Texas' water supply and monitor drought conditions. In this *Ask an Expert* article, Dr. Mark Wentzel, a hydrologist in the TWDB Surface Water Division, highlights the reservoir data featured on the site and explains how these measurements are collected, processed, and made accessible to Texans.

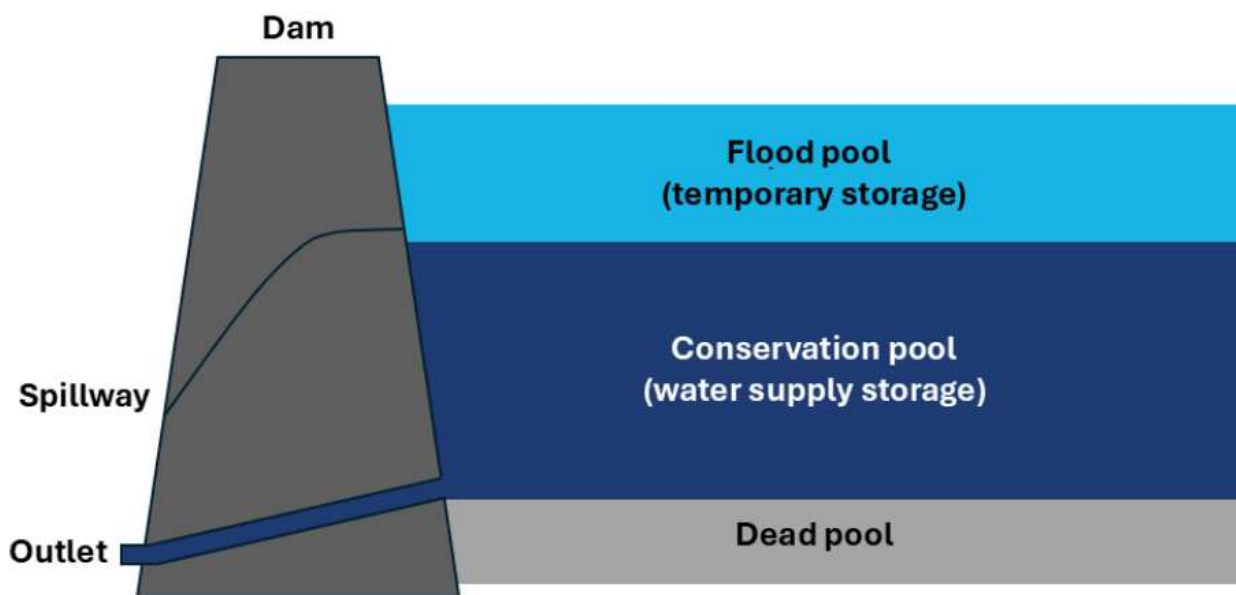
What reservoir data are available on Water Data for Texas?

Data for three types of reservoirs are tracked on the Water Data for Texas website:

- **Those operated exclusively for water supply (such as Lake Livingston)**
- **Flood control (such as Addicks and Barker Reservoirs)**
- **Dual-purpose reservoirs that serve both functions (such as Lake Stillhouse Hollow and Canyon Lake)**

Water supply reservoirs store water when it's plentiful and release or divert it later to meet municipal, agricultural, industrial, and other needs. Flood control reservoirs store water temporarily during high flow events to reduce flooding downstream; they cannot store or divert water for supply and must release water safely once flood risk has passed.

Some reservoirs serve both purposes by having a conservation pool for water supply and a flood pool for flood protection. They can store water up to the top of the conservation pool and, during high flows, temporarily store water in the flood pool. After the threat of flooding has passed, they must release water from the flood pool to return to conservation levels. The following graphic shows the relationship between the conservation and flood pools for a dual-purpose reservoir. In this figure, "dead pool" refers to inactive storage that is below the lowest controlled outlet and therefore cannot be released from the reservoir.



The Water Data for Texas website provides data for 122 reservoirs across the state and for Elephant Butte Reservoir in New Mexico (which provides water supply to West Texas). These reservoirs have the capacity to store 31.5 million acre-feet of water for water supply (representing more than 96 percent of the state's total water supply storage). For each lake or reservoir, information is provided on how a lake's current volume compares to the maximum volume that can be stored for water supply and/or how the lake's current elevation compares to the maximum elevation that can be maintained for flood control. You can also find data for the combined water supply storage of reservoirs associated with 19 different municipal areas, 14 river basins, 16 planning regions, 10 climate regions, and the entire state.

Web pages for individual reservoirs (or groups of reservoirs) include graphs showing reservoir conditions over the last few months, years, and entire period of record—and there is also a map showing the reservoir's location. For individual reservoirs, additional information—such as the date the reservoir began to store water (impoundment date), the reference used to describe the water surface elevation in the reservoir (vertical datum), and other details—is also provided.

Who uses the reservoir data on Water Data for Texas?

Reservoir data are used by federal, state, and local agencies as well as the public for a variety of purposes. Along with historical demands and inflows, current volume data can be used to estimate when critical water-supply levels may be reached. Long-term reservoir data play an important part in water supply planning, while current reservoir conditions are considered by flood forecasters at the National Weather Service. Also, data from some reservoirs are used to determine when drought restrictions are imposed on water users, how much water will be supplied to farmers during the next irrigation season, or what releases will be made to satisfy environmental flow, treaty, or compact obligations. Recreational users also consult reservoir data when planning their activities.

What reservoir data are gathered?

The foundational piece of reservoir data are the water surface elevation measurements. Based on these data, WDfT provides information on how a lake's current volume compares to the maximum volume that can be stored for water supply and/or how the lake's current elevation compares to the maximum elevation that can be maintained for flood control. For water supply lakes, WDfT calculates surface area and the volume of

water stored in the lake using elevation-area-capacity curves (which relate water surface elevation to surface area and volume).

Before construction, these curves may be estimated from studies of land surface and dam design. After lakes fill, hydrographic surveys provide the data to develop these curves. Because sediment from inflows accumulates over time, the relationship between water surface elevation, surface area, and volume may change accordingly. To maintain accuracy, the TWDB recommends that water supply lakes be resurveyed every 10 years or after significant inflow events. To assist lake owners, the TWDB maintains a hydrographic survey program described on the agency's [website \(https://www.twdb.texas.gov/surfacewater/surveys/index.asp\)](https://www.twdb.texas.gov/surfacewater/surveys/index.asp).

What methods are used to gather reservoir data?

The water surface elevation data provided by lake gage operators are the basis of the reservoir data on the WDfT website. Water surface elevation data on the WDfT website come from several organizations, including the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, International Boundary and Water Commission, Lower Colorado River Authority, and U.S. Geological Survey.

Lake level gages operated by these organizations may employ several different technologies to measure water surface elevation. Pressure transducers and bubblers measure water pressure on top of an instrument and convert that to an equivalent depth of water. Floats and staff gages directly measure the elevation of the reservoir. Radar equipment measures the water elevation below an instrument. The choice of measurement technology is influenced by conditions at each site, and regardless of the system being used, operation and maintenance are required to ensure that the equipment is recording accurate data.

How are the data transmitted?

Water surface elevation data collected from reservoirs on the WDfT website are automatically collected and transmitted from the lake gage to the owner of those data (e.g. U.S. Army Corps of Engineers, U.S. Geological Survey, etc.) by satellite or cellular communication. After a quick examination of the data, they are published on the internet where the data are available to the public. Timing for individual reservoirs varies, but in general, water surface elevation data are collected every 15 minutes, transmitted every hour or less, and available to the public within two hours.

What steps are involved in processing the data before it's made public?

Quality control checks for water-surface elevation data take time, so the U.S. Geological Survey releases preliminary data with only minimal review and cautions users to interpret the data accordingly. Preliminary data may contain errors due to equipment malfunction or adverse conditions at a gage site. For example, during prolonged drought, water within the reservoir may fall below the range that can be measured by the equipment. Conversely, during severe flooding, equipment may be damaged by rising water or debris.

Approved data, which undergo thorough quality control checks, are released by the U.S. Geological Survey several months later. The WDfT website reports preliminary data as it is released to the public and later, as they become available from lake gage operators, replaces preliminary data with approved data in historical records. The process of checking and updating historical data occurs automatically every night.

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