



Hydrographic Survey Program

What is the Hydrographic Survey Program?

The Hydrographic Survey Program was created in 1991 when the 72nd Texas Legislature authorized the Texas Water Development Board (TWDB) to develop a nonprofit, self-supporting, reservoir volumetric and sedimentation survey program.

At the request of a political subdivision, a state or federal agency, or an agency of a neighboring state, the program is authorized to generate revenue through charges to its customers for conducting surveys that: determine reservoir storage capacity, sedimentation levels, rates of sedimentation, projected water supply availability, or potential mitigative measures; provide bathymetric studies; or collect information on water-bearing formations. The program has provided reservoir owners with updated information on the storage capacity and surface area for their reservoirs since the program became fully staffed in 1992.

Why is hydrographic surveying important?

Sedimentation in reservoirs affects the capacity to store water, which in turn impacts the availability of water supply. The 2022 State Water Plan references the impact of sedimentation as follows: “Total annual existing surface water supply is anticipated to remain generally stable, declining approximately 2 percent [or 150,000 acre-feet] from 2020 through 2070. The decrease is primarily due to sedimentation decreasing the storage capacity of many reservoirs” (2022 State Water Plan Ch. 5, pg. 77). However, rates of reservoir sedimentation vary greatly across Texas as a function of numerous factors including local climate, soils, sediment carrying capacity of contributing streams, and the size and position of a reservoir.

The 2021 Region B Regional Water Plan states that “there are areas with highly erodible soils in Region B that contribute to the accumulation of sediment, which can significantly impact reservoir storage capacities.” (Region B, Volume 2: Appendices, p. A-26). The plan also projects a 55% decrease in reliable supplies from reservoirs within the region of over the 50-year planning horizon—from 48,674 acre-feet per year to 27,770 acre-feet per year (Region B, p. 2-28).

With population and statewide water use increasing, having current estimates of reservoir capacity and capacity loss rates is crucial for water planning. Local, regional, and state water planners use this information to guide the development and use of water supplies to meet Texans’ present and future

needs, especially during times of drought. For reservoirs designed for flood control, capacity estimates can aid in management decisions. For reservoir owners, estimates of total sediment volume aid in assessing long-term declines in reservoir yield and in considering potential remedies, such as dredging.

As of January 2025, the TWDB’s Hydrographic Survey Program has completed 196 hydrographic surveys on 116 unique Texas reservoirs. This includes 108 of the 189 major water supply reservoirs identified in the 2022 State Water Plan. By definition, a major reservoir has a conservation storage capacity of 5,000 acre-feet or greater.

What equipment is used to do the surveys?

The TWDB’s survey fleet consists of multiple vessels capable of handling reservoir conditions across the state. Each can be equipped with survey equipment, such as a multi-frequency (200 kHz, 50 kHz, and 12 kHz) acoustic depth sounder with integrated Differential Global Positioning System (DGPS) to collect bathymetry and sediment data, or a multibeam system for high accuracy bathymetry.

While a volumetric survey identifies the current bottom surface of a reservoir, a TWDB sedimentation survey identifies the pre-impoundment surface of the reservoir by correlating sediment core samples collected throughout the reservoir with the multi-frequency acoustic data. Identification of the pre-impoundment surface enables verification of initial reservoir capacity, thereby providing better estimates of long-term sedimentation rates.

GIS software is used to analyze and model bathymetric, topographic, sediment, and pre-impoundment reservoir conditions. Survey products include elevation-area-capacity tables and bathymetric contour and elevation relief maps for a volumetric survey, and average annual sedimentation rates and a map of sediment thickness throughout the reservoir for a sedimentation survey. The multi-frequency depth sounder used in conjunction with GPS and GIS technology significantly improves Texas’ ability to collect the data needed to plan for and meet its future water resource needs.

How can I request a hydrographic survey?

For more information about the Hydrographic Survey Program, as well as data and reports from completed surveys, visit www.twdb.texas.gov/surfacewater/surveys.

For general questions, contact: Hydrosurvey@twdb.texas.gov.

For all other questions, including contracting and surveying information, contact:

Dr. Mindy Conyers

Manager, River Science & Hydrosurvey Program

Mindy.Conyers@twdb.texas.gov or 512-463-5102