

**Volumetric and
Sedimentation Survey
of
CHOKE CANYON
RESERVOIR
August - October 2024**



March 2026

Texas Water Development Board

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Prepared for:

City of Corpus Christi, Texas

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The Texas Water Development Board would appreciate acknowledgement.

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Executive summary

In August 2024, the Texas Water Development Board (TWDB) entered into an agreement with the City of Corpus Christi, Texas, to perform a volumetric and sedimentation survey of Choke Canyon Reservoir (Live Oak and McMullen counties, Texas). Surveying was performed using a multi-frequency (200 kHz, 50 kHz, and 12 kHz), sub-bottom profiling depth sounder. Sediment core samples were collected and correlated with sub-bottom acoustic profiles to estimate sediment accumulation thicknesses and sedimentation rates.

Choke Canyon Dam, impounding Choke Canyon Reservoir, is located on the Frio River in Live Oak and McMullen counties, approximately 3.5 miles northwest of the City of Three Rivers, Texas. The conservation pool elevation of Choke Canyon Reservoir is 220.5 feet above mean sea level (NGVD29). TWDB collected bathymetric data for Choke Canyon Reservoir on August 27-30, 2024, September 3-5, 2024, and October 1-2, 2024, while daily average water surface elevations ranged from 189.80 to 188.98 feet NGVD29.

The 2024 TWDB volumetric survey indicates Choke Canyon Reservoir has a total reservoir capacity of 669,186 acre-feet and encompasses 25,510 acres at conservation pool elevation (220.5 feet NGVD29). Previous capacity estimates at elevation 220.5 feet include an area-capacity table from the U.S. Bureau of Reclamation dated 1983 indicating a capacity of 695,125 acre-feet, a 1993 TWDB volumetric survey estimate of 695,271 acre-feet, and a 2012 TWDB volumetric survey estimate of 662,821 acre-feet. Differences in reservoir conditions as well as differences in the methodologies used among surveys can affect area and volume calculations. For this reason, the TWDB does not recommend comparing between volumetric surveys to determine loss of area or capacity. Information from past surveys is thus presented for informational purposes only.

The 2024 TWDB sedimentation survey measured 9,489 acre-feet of sediment below elevation 185.0 feet. The sedimentation survey indicates sediment accumulation is greater in the submerged river channels throughout the reservoir. The TWDB recommends that reservoirs be resurveyed approximately every 10 years or following a major event that results in increased sedimentation or scouring within the reservoir.

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Note: References to brand names throughout this report do not imply endorsement by the Texas Water Development Board

Introduction

The Hydrographic Survey Program of the Texas Water Development Board (TWDB) was authorized by the 72nd Texas State Legislature in 1991. Texas Water Code Section 15.804 authorizes the TWDB to perform surveys to determine reservoir storage capacity, sedimentation levels, rates of sedimentation, and projected water supply availability.

In August 2024, the TWDB entered into an agreement with the City of Corpus Christi, Texas, to perform a volumetric and sedimentation survey of Choke Canyon Reservoir (Live Oak and McMullen counties, Texas) (Texas Water Development Board, 2024). This report provides an overview of the survey methods, analysis techniques, and associated results. Also included are the following contract deliverables: (1) an elevation-area-capacity table of the reservoir acceptable to the Texas Commission on Environmental Quality (Appendices A, B, E, and F), (2) a bottom contour map (Figure 6), (3) a shaded relief plot of the reservoir bottom (Figure 4), and (4) an estimate of sediment accumulation and location (Figure 9).

Choke Canyon Reservoir general information

Choke Canyon Dam, impounding Choke Canyon Reservoir, is located on the Frio River (Nueces River Basin) in Live Oak and McMullen Counties, approximately 3.5 miles northwest of Three Rivers, Texas (Figure 1). Choke Canyon Dam and Choke Canyon Reservoir are owned by the U.S. Department of the Interior, Bureau of Reclamation, and operated by the City of Corpus Christi (Texas Water Development Board, 2013). Construction on Choke Canyon Dam began on August 10, 1978. The dam was considered substantially complete on May 18, 1982, and the official dedication ceremony was held on June 8, 1982 (U.S. Bureau of Reclamation, 2026a). The reservoir was built primarily for water supply for the cities of Corpus Christi and Three Rivers, and the Nueces River Authority, supplying water for municipal, industrial, and recreational purposes (U.S. Bureau of Reclamation, 2023). Additional pertinent data about Choke Canyon Dam and Choke Canyon Reservoir can be found in Table 1.

Water rights for Choke Canyon Reservoir have been appropriated to the City of Corpus Christi, the Nueces River Authority, and the City of Three Rivers through Certificate of Adjudication No. 21-3214 and Amendment to Certificate of Adjudication No. 21-3214A, 21-3214B, and 21-3214C. (Texas Commission on Environmental Quality, 2026). The complete certificates and permits are on file at the Texas Commission on Environmental Quality (TCEQ).

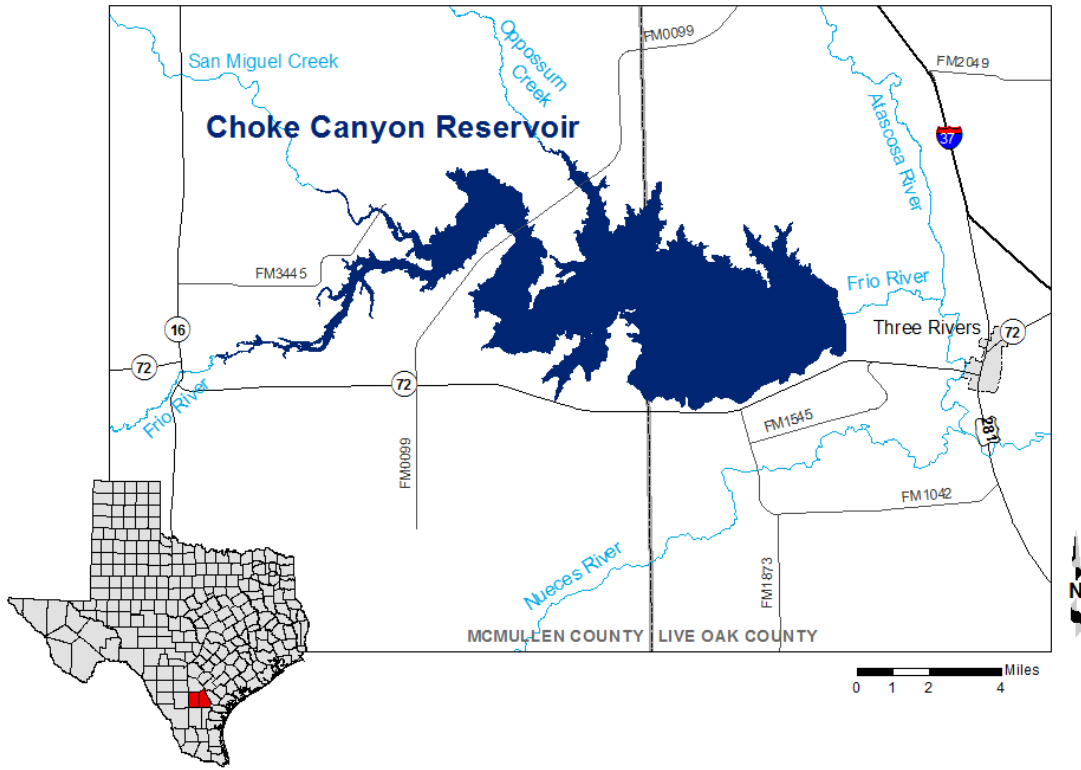


Figure 1. Location map.

Table 1. Pertinent Data for Choke Canyon Dam and Choke Canyon Reservoir

Owner(s)			
U.S. Department of the Interior, Bureau of Reclamation			
Engineer (design)			
U.S. Department of the Interior, Bureau of Reclamation			
Location			
On the Frio River, Nueces River Basin, in Live Oak and McMullen counties, approximately 3.5 miles northwest of Three Rivers, Texas			
Drainage Area			
Total Drainage Area	5,490 square miles		
Dam			
Type	Rolled earthfill		
Total length (including spillway)	3.5 miles		
Structural height	114.14 feet		
Crest elevation	241.14 feet		
Spillway			
Type	Concrete ogee		
Length	368 feet		
Crest elevation	199.5 feet		
Control	7 radial gates, 49.2 feet by 23.7 feet		
Top of gate elevation	223.2 feet NGVD29		
Outlet Works			
The intake tower for the river outlet works is a concrete structure outfitted with four multilevel gates at elevations 203.0, 181.5, 150.0, and 136.38 feet.			
Reservoir Data			
		TWDB 2024	TWDB 2024
	Elevation	Capacity	Area
Feature	(feet NGVD29^a)	(acre-feet)	(acres)
Top of Dam	241.14	1,351,873	42,001
Maximum design water surface	232.18	1,014,349	33,702
Top of spillway gate	223.2	741,108	27,386
Top of conservation pool	220.5	669,186	25,510
Outlet works	203.0	303,640	16,509
	181.5	64,615	6,346
Top of inactive pool	150.0	239.0	78.0
Top of dead pool	136.38	0	0
Conservation storage capacity ^b	—	669,186	—

Source: National Inventory of Dams, 2026; Texas Water Development Board, 2003; Texas Water Development Board, 2013; U.S. Bureau of Reclamation, 2023; U.S. Bureau of Reclamation, 2026b.

^a. National Geodetic Vertical Datum 1929 (NGVD29). The datum conversion from NGVD29 to NAVD88 (North American Vertical Datum 1988) is: NGVD29 + 0.05 feet = NAVD88 (U.S. Geological Survey, 2026).

^b. Usable conservation storage equals total capacity at conservation pool elevation minus dead pool capacity. Dead pool refers to water that cannot be drained by gravity through the dam outlet works.

Volumetric and sedimentation survey of Choke Canyon Reservoir

Datum

Water surface elevations during the TWDB survey were obtained from the United States Geological Survey (USGS) gage USGS 08206900 *Choke Canyon Res nr Three Rivers, TX* (U.S. Geological Survey, 2026). These data were used to convert survey depths to elevations.

Elevations herein are reported in feet relative to the National Geodetic Vertical Datum 1929

(NGVD29). The horizontal datum used for this report is NGVD29, and the horizontal coordinate system is State Plane Texas South Central Zone (feet).

TWDB bathymetric and sedimentation data collection

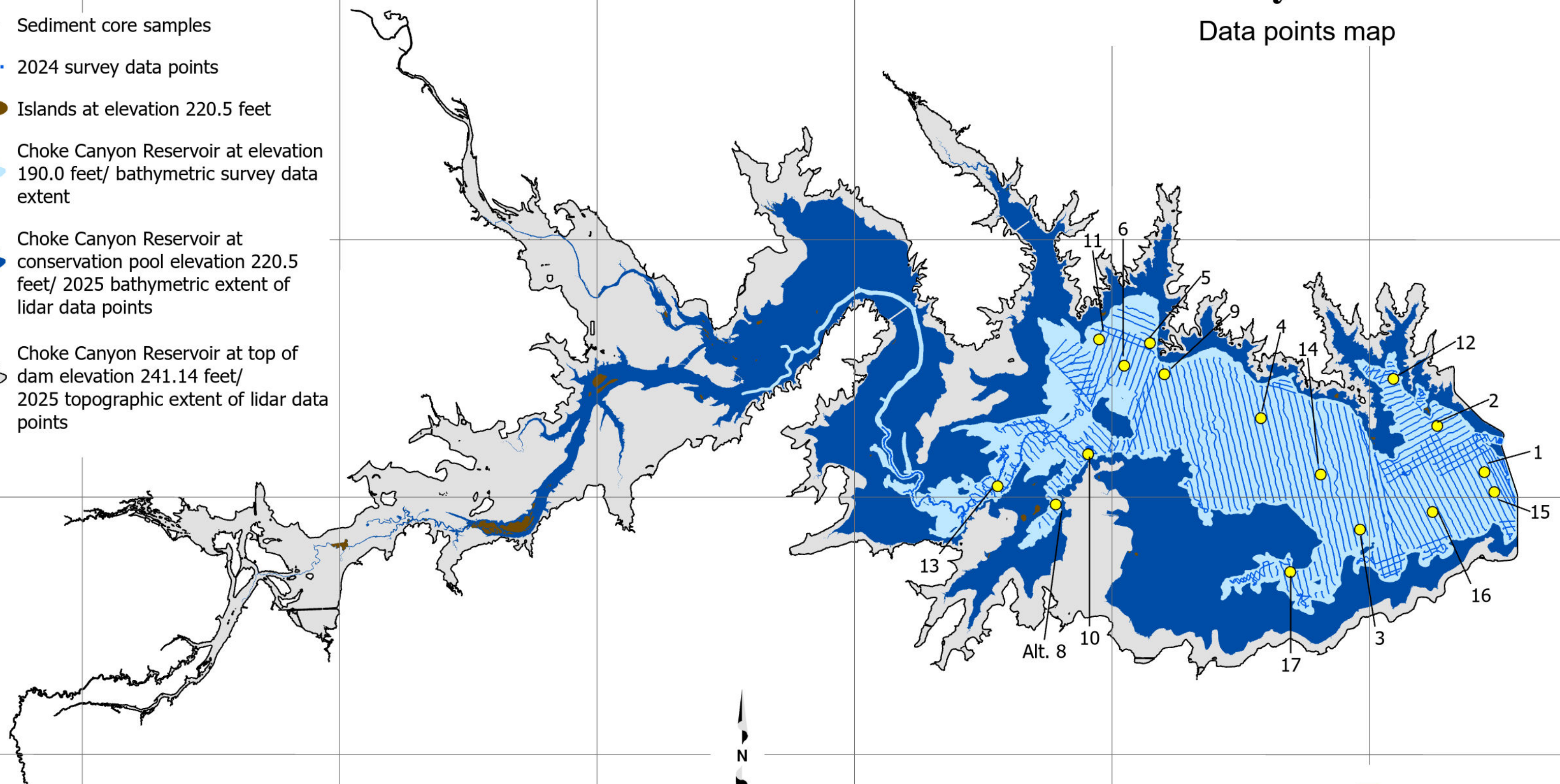
The TWDB collected bathymetric data for Choke Canyon Reservoir on August 27-30, 2024, September 3-5, 2024, and October 1-2, 2024, while daily average water surface elevations measured ranged from 189.80 to 188.98 feet NGVD29 (U.S. Geological Survey, 2026). For data collection, the TWDB used a Specialty Devices, Inc. (SDI), single-beam, multi-frequency (200 kHz, 50 kHz, and 12 kHz) sub-bottom profiling depth sounder integrated with differential global positioning system (DGPS) equipment. Data were collected along pre-planned survey lines oriented perpendicular to the assumed location of the original river channels and spaced approximately 500 feet apart. Many of the same lines also were used by the TWDB for the *Volumetric and Sedimentation Survey of Choke Canyon Reservoir, June 2012 Survey* (Texas Water Development Board, 2013). The depth sounder was calibrated daily using a velocity profiler to measure the speed of sound in the water column and a weighted tape or stadia rod for depth reading verification. Each speed of sound profile, or velocity cast, is saved for further data processing. Figure 2 shows the data collection locations for the 2024 TWDB survey.

All sounding data were collected and reviewed before sediment core sampling sites were selected. Sediment core samples are collected throughout the reservoir to assist with interpretation of the sub-bottom acoustic profiles. After analyzing the sounding data, the TWDB selected 18 locations to collect sediment core samples (Figure 2). Sediment cores were collected April 9-10, 2025, with a custom-coring boat and an SDI VibeCore system.

Sediment cores are collected in 3-inch diameter aluminum tubes. A sediment core extends from the current reservoir-bottom surface, through the accumulated sediment, and into the pre-impoundment surface. After the sample is retrieved, the core tube is cut to the level of the sediment core. The tube is capped, labeled, and either transported to TWDB headquarters for further analysis or analyzed onsite at the reservoir.

Figure 2
Choke Canyon Reservoir
 Data points map

- Sediment core samples
- ⋯ 2024 survey data points
- Islands at elevation 220.5 feet
- Choke Canyon Reservoir at elevation 190.0 feet/ bathymetric survey data extent
- Choke Canyon Reservoir at conservation pool elevation 220.5 feet/ 2025 bathymetric extent of lidar data points
- Choke Canyon Reservoir at top of dam elevation 241.14 feet/ 2025 topographic extent of lidar data points



Projection: NAD83 State Plane
 Texas South Central Zone (feet)

0 1 2 4 Miles



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Data processing

Model boundary

The bathymetric and topographic model boundaries of the reservoir were generated with Light Detection and Ranging (lidar) data available from the Texas Geographic Information Office (TxGIO), formerly known as the Texas Natural Resource Information System (TNRIS). These data were collected on January 19, 2025, while the daily average water surface elevation of the reservoir measured 187.24 feet NGVD29. The lidar data files (.las) were imported into an LAS Dataset and the dataset was converted to a raster using a cell size of 1.0 meter by 1.0 meter. The horizontal datum of the lidar data is North American Datum 1983 (NAD83; meters) and the projection is Universal Transverse Mercator (UTM) Zone 14. The vertical datum is North American Vertical Datum 1988 (NAVD88; meters). A contour representing the conservation pool elevation of 67.22364 meters NAVD88, equivalent to 220.5 feet NGVD29 and a contour representing the top of the dam elevation of 73.514712 meters NAVD88, equivalent to 241.14 feet NGVD29 were extracted from the raster. The vertical datum transformation of 0.05 feet was used to convert from feet NAVD88 to feet NGVD29. The vertical datum transformation offset for the conversion from NAVD88 to NGVD29 is the same transformation value the USGS uses (U.S. Geological Survey, 2026). The topographic model contour was edited to close the contour across the dam and remove other artifacts.

Lidar data points

To utilize the lidar data in the reservoir topographic model, the lidar data files (.las) were converted to a multipoint feature class in an Environmental Systems Research Institute's ArcGIS file geodatabase filtered to include only data classified as ground points. A topographical model of the data was generated. The ArcGIS tool Terrain to Points was used to extract points from the terrain, or topographical model, of the reservoir. The terrain was created using the z-tolerance pyramid type. Points were extracted from the terrain at the z-tolerance level of 0.125 meters to model both the bathymetric surface and the topographic surface. New attribute fields were added to convert the elevations from meters NAVD88 to feet NAVD88, then feet NGVD29 for compatibility with the bathymetric survey data. Lidar data points inside the bathymetric model boundary that overlapped with bathymetric survey data were verified against the survey data and any lidar data points that were not in agreement were deleted. The bathymetric and topographic

lidar data points were separated, and both feature classes were projected to NAD83 State Plane Texas South Central Zone (feet).

Triangulated Irregular Network model

Following completion of data collection, the raw data files collected by the TWDB were edited to remove data anomalies. The current bottom surface of the reservoir is automatically determined by the data acquisition software. Hydropick software, developed by TWDB staff, was used to display, interpret, and edit the multi-frequency data by manually removing data anomalies in the current bottom surface and to manually edit the pre-impoundment surfaces. The speed of sound profiles, also known as velocity casts, were used to further refine the measured depths. For each location velocity casts are collected, the harmonic mean sound speed of all the casts is calculated. From this, depths collected using one average speed of sound are corrected with an overall optimum speed of sound for each specific depth (Specialty Devices, Inc., 2018).

All data were exported into a single file, including the current reservoir bottom surface, pre-impoundment surface, and sediment thickness at each sounding location. The water surface elevation at the time of each sounding was used to convert each sounding depth to a corresponding reservoir-bottom elevation. This survey point dataset was then preconditioned by inserting a uniform grid of artificial survey points between the actual survey lines. Bathymetric elevations at these artificial points were determined using an anisotropic spatial interpolation algorithm described in the next section. This technique creates a high resolution, uniform grid of interpolated bathymetric elevation points throughout a majority of the reservoir (McEwen, Brock, and others, 2011). The resulting point file was used in conjunction with sounding and boundary data to create volumetric and sediment Triangulated Irregular Network (TIN) models utilizing the 3D Analyst Extension of ArcGIS. The 3D Analyst algorithm uses Delaunay's criteria for triangulation to create a grid composed of triangles from non-uniformly spaced points, including the boundary vertices (Environmental Systems Research Institute, 1995).

Spatial interpolation of reservoir bathymetry

Isotropic spatial interpolation techniques such as the Delaunay triangulation used by the 3D Analyst extension of ArcGIS are, in many instances, unable to suitably interpolate bathymetry between survey lines common to reservoir surveys. Reservoirs and stream channels are anisotropic morphological features where bathymetry at any particular location is more similar to upstream and downstream locations than to transverse locations. Interpolation schemes

that do not consider this anisotropy lead to the creation of several types of artifacts in the final representation of the reservoir bottom surface and hence to errors in volume. These artifacts may include artificially curved contour lines extending into the reservoir where the reservoir walls are steep or the reservoir is relatively narrow, intermittent representation of submerged stream channel connectivity, and oscillations of contour lines in between survey lines. These artifacts reduce the accuracy of the resulting volumetric and sediment TIN models in areas between actual survey data.

To improve the accuracy of bathymetric representation between survey lines, the TWDB developed various anisotropic spatial interpolation techniques. Generally, the directionality of interpolation at different locations of a reservoir can be determined from external data sources. A basic assumption is that the reservoir profile in the vicinity of a particular location has upstream and downstream similarity. In addition, the sinuosity and directionality of submerged stream channels can be determined by directly examining the survey data, or more robustly by examining scanned USGS 7.5-minute quadrangle maps (DRGs), hypsography files (the vector format of USGS 7.5-minute quadrangle map contours), and historical aerial photographs, when available. Using the survey data, polygons are created to partition the reservoir into segments with centerlines defining the directionality of interpolation within each segment. Using the interpolation definition files and survey data, the current reservoir-bottom elevation, pre-impoundment elevation, and sediment thickness are calculated for each point in the high-resolution uniform grid of artificial survey points. The reservoir boundary, artificial survey points grid, and survey data points are used to create volumetric and sediment TIN models representing reservoir bathymetry and sediment accumulation throughout the reservoir. Specific details of this interpolation technique can be found in the HydroTools manual (McEwen, Brock, and others, 2011) and in associated literature (McEwen, Pothina, and Negusse, 2011).

In areas inaccessible to survey data collection, such as small coves and shallow upstream areas of the reservoir, linear interpolation is used for volumetric and sediment accumulation estimations (McEwen, Brock, and others, 2011). Although LIDAR was utilized, linear interpolation was necessary to accurately model features in the areas between survey data and LIDAR data. Linear interpolation results in improved elevation-capacity and elevation-area calculations.

Figure 3 illustrates typical results from application of anisotropic interpolation as applied to Choke Canyon Reservoir. In Figure 3A, deeper channels and steep slopes indicated by surveyed cross-sections are not continuously represented in areas between survey cross-sections.

This is an artifact of the TIN generation routine rather than an accurate representation of the physical bathymetric surface. Inclusion of interpolation points in creation of the volumetric TIN model, represented in Figure 3B, directs Delaunay triangulation to better represent the reservoir bathymetry between survey cross-sections. The bathymetry shown in Figure 3C was used in computing reservoir elevation-capacity (Appendices A and E) and elevation-area (Appendices B and F) tables.

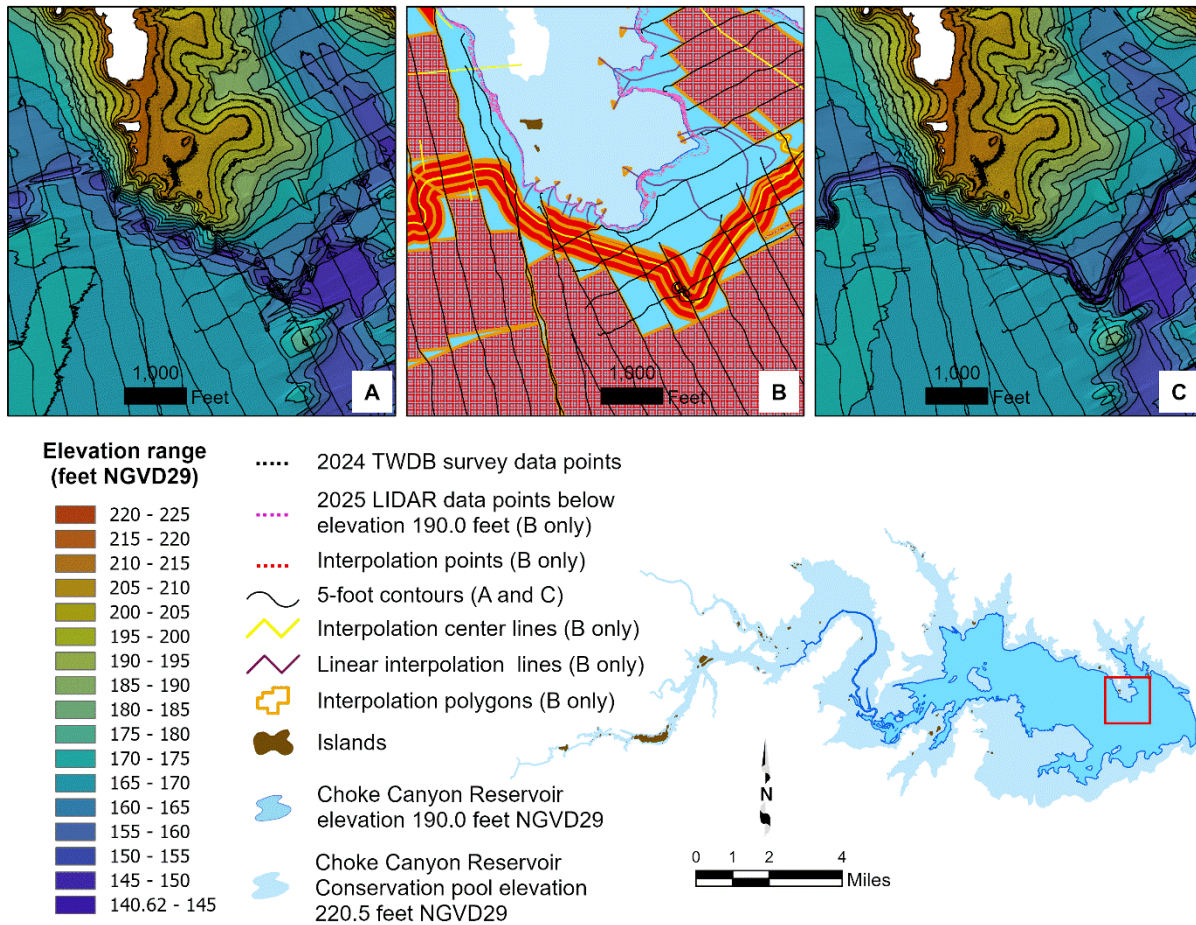


Figure 3. Anisotropic spatial interpolation as applied to Choke Canyon Reservoir sounding data: A) bathymetric contours without interpolated points; B) sounding points (*black*), LIDAR data points below elevation 190.0 feet (*pink*), and interpolated points (*red*); C) bathymetric contours with interpolated points.

Area, volume, and contour calculation

Volumes and areas were computed for the entire reservoir at 0.01-foot intervals, from 140.6 to 220.5 feet for the bathymetric TIN model, and from 140.6 to 241.14 feet for the bathymetric and topographic TIN model, and are reported herein at 0.1-foot intervals. The bathymetric elevation-capacity table and bathymetric elevation-area table, based on the 2024 survey and analysis, are presented in Appendices A and B, respectively. The bathymetric

capacity curve is presented in Appendix C, and the bathymetric area curve is presented in Appendix D. The topographic elevation-capacity table and topographic elevation-area table developed from the 2024 survey and analysis are presented in Appendices E and F, respectively. The topographic capacity curve is presented in Appendix G, and the topographic area curve is presented in Appendix H.

The topographic and bathymetric volumetric TIN models were converted to a raster representation using a cell size of 2 feet by 2 feet. The raster data then were used to produce three figures: (1) an elevation relief map representing the topography of the reservoir bottom (Figure 4); (2) a depth range map showing depth ranges for Choke Canyon Reservoir (Figure 5); and (3) a 5-foot contour map (Figure 6).

Figure 4
Choke Canyon Reservoir
 Elevation relief map

Elevation
 (bathymetric)

feet NGVD29

- 140 - 145
- 145 - 150
- 150 - 155
- 155 - 160
- 160 - 165
- 165 - 170
- 170 - 175
- 175 - 180
- 180 - 185
- 185 - 190
- 190 - 195
- 195 - 200
- 200 - 205
- 205 - 210
- 210 - 215
- 215 - 220
- 220 - 220.5

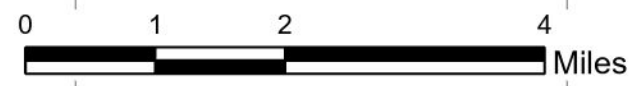
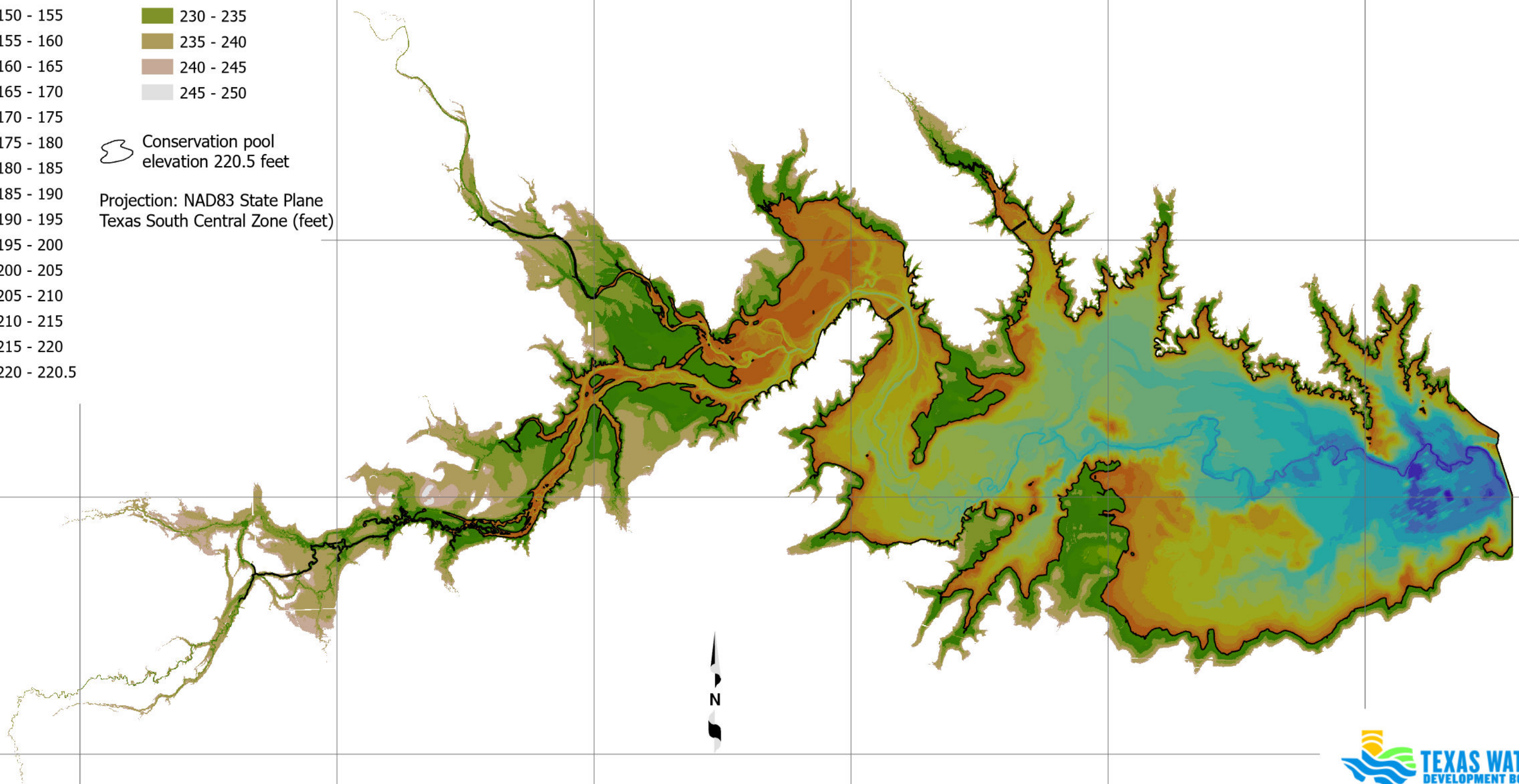
Elevation
 (topographic)

feet NGVD29

- 220.5 - 225
- 225 - 230
- 230 - 235
- 235 - 240
- 240 - 245
- 245 - 250

Conservation pool
 elevation 220.5 feet

Projection: NAD83 State Plane
 Texas South Central Zone (feet)



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Figure 5

Choke Canyon Reservoir

Depth range map

Depth ranges
(Feet)

- 0 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- 70 - 75
- > 75

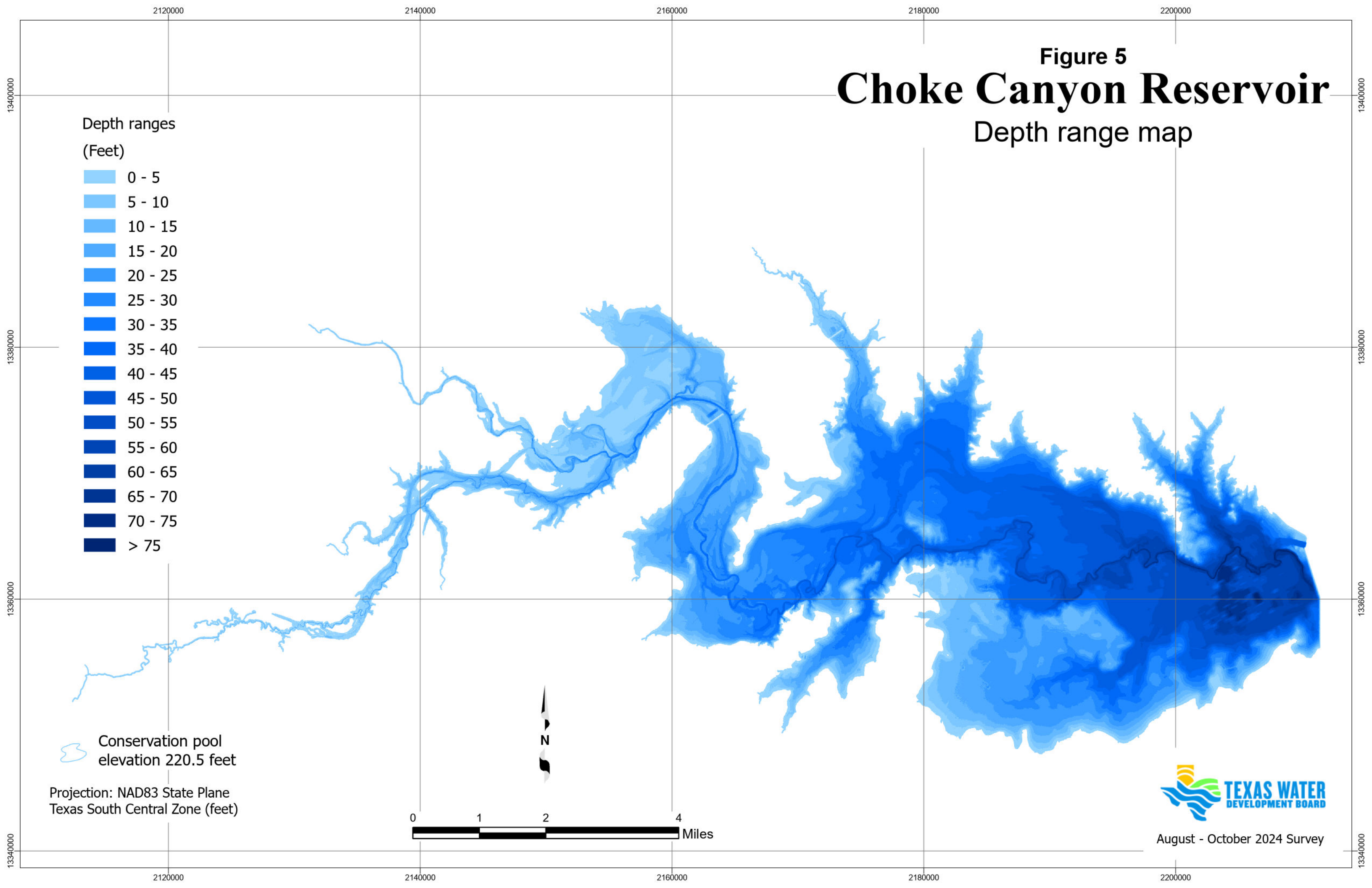
Conservation pool
elevation 220.5 feet

Projection: NAD83 State Plane
Texas South Central Zone (feet)

0 1 2 4 Miles



August - October 2024 Survey



Analysis of sediment data from Choke Canyon Reservoir

Sedimentation in Choke Canyon Reservoir was determined by analyzing the acoustic signal returns of all three depth sounder frequencies using customized software called Hydropick. The 200 kilohertz (kHz) signal is used to determine the current bathymetric surface. The 200 kHz, 50 kHz, and 12 kHz are analyzed to determine the reservoir bathymetric surface at the time of initial impoundment, *i.e.*, pre-impoundment surface. Sediment core samples collected in the reservoir are correlated with the acoustic signals in each frequency to assist in identifying the pre-impoundment surface. The difference between the current surface bathymetry and the pre-impoundment surface bathymetry yields a sediment thickness value at each sounding location.

Sediment cores were split longitudinally and analyzed to identify the location of the pre-impoundment surface. The pre-impoundment surface was identified within the sediment core using the following methods: (1) a visual examination of the sediment core for terrestrial materials, such as leaf litter, tree bark, twigs, intact roots, *etc.*, concentrations of which tend to occur on or just below the pre-impoundment surface; (2) recording changes in texture from well sorted, relatively fine-grained sediment to poorly sorted mixtures of coarse and fine-grained materials; and, (3) identifying variations in the physical properties of the sediment, particularly sediment water content and penetration resistance with depth (Van Metre and others, 2004). Total sediment core length, post impoundment sediment thickness, and pre-impoundment thickness were recorded. Physical characteristics of the sediment core, such as Munsell (2018) soil color, texture, relative water content, and presence of organic materials are presented in Table 2.

Table 2. Sediment core sample analysis data.

Sediment core sample	Easting ^a (feet)	Northing ^a (feet)	Total core sample / post-impoundment sediment length (inches)	Sediment core description ^b		Munsell soil color
CCR-1	2208938.24	13361954.06	10.0 / 2.0	post-impoundment	0.0–2.0" high water content, fine silt, smooth	5Y 3/2 dark olive gray
				pre-impoundment	2.0–10.0" low water content, clay with varying sized clay bits, organic material present (fibrous roots)	5Y 2.5/1 black
CCR-2	2205272.89	13365542.55	6.0 / 4.0	post-impoundment	0.0–4.0" high water content, pudding like, silty clay with coarse clay bits, organic material present (terrestrial vegetation)	5Y 2.5/2 black
				pre-impoundment	4.0–6.0" moderate to low water content, clay, malleable, organic material present throughout (fibrous roots)	5Y 2.5/1 black
CCR-3	2199272.68	13357486.04	27.0 / 26.0	post-impoundment	0.0–2.0" high water content fine silt, soupy	5Y 3/2 dark olive gray
					2.0–26.0" moderate water content, silty clay with very fine clay bits throughout, pudding like, density increases with depth	5Y 3/2 dark olive gray
				pre-impoundment	26.0–27.0" moderate water content, clay, dense, organic material present throughout (fibrous roots)	5Y 3/2 dark olive gray
CCR-4	2191571.57	13366142.08	5.0 / 1.0	post-impoundment	0.0–1.0" high water content, fine silt, soupy	5Y 2.5/1 black
				pre-impoundment	1.0–5.0" moderate water content, silty clay, malleable, easily crumbles, organic material present throughout (fibrous roots)	5Y 2.5/1 black
CCR-5	2182953.29	13371971.88	28.0 / 19.0	post-impoundment	0.0–3.0" high water content, fine silt, soupy	5Y 3/2 dark olive gray
					3.0–16.0" moderate water content, silty clay, smooth, clay bits present at bottom of layer	5Y 3/2 dark olive gray

^a. Coordinates are based on NAD83 State Plane Texas South Central System (feet).

^b. Sediment core samples are measured in inches with zero representing the current bottom surface.

Table 2 (continued). Sediment core sample analysis data.

Sediment core sample	Easting ^a (feet)	Northing ^a (feet)	Total core sample / post-impoundment sediment length (inches)	Sediment core description ^b		Munsell soil color
CCR-5 (cont.)	2182953.29	13371971.88	28.0 / 19.0	post-impoundment	16.0–19.0" moderate water content, silty clay, loosely packed, milkshake consistency, organic material present (fibrous roots)	5Y 2.5/2 black
				pre-impoundment	19.0–28.0" low water content, clay, easily fractures, malleable, organic material present throughout (fibrous roots)	5Y 2.5/1 black
CCR-6	2180948.42	13370216.84	11.0 / 7.0	post-impoundment	0.0–2.0" very high water content, fine silt, soupy, smooth, uniform consistency and texture	5Y 3/2 dark olive gray
					2.0–7.0" high to moderate water content, water content decreases with depth, silty clay, smooth, fine clay bits present	5Y 3/2 dark olive gray
				pre-impoundment	7.0–11.0" low water content, clay, dense, easily fractures, malleable, organic material present (fibrous roots)	5Y 2.5/1 black
CCR-7	2173985.30	13364169.00	N/A	N/A	No recovery, dense standing timber, shallow water depths at time of collection	N/A
CCR-8	2174356.00	13357924.90	N/A	N/A	No recovery, shallow water depths at time of collection	N/A
CCR-9	2184073.56	13369554.19	45.0 / N/A	post-impoundment	0.0–2.0" high water content, fine silt, soupy, uniform texture throughout	5Y 3/2 dark olive gray
					2.0–45.0" high to moderate water content, water content decreases with depth, silty clay, smooth, density increases with depth	5Y 3/2 dark olive gray
CCR-10	2178146.98	13363340.96	117.0 / N/A	post-impoundment	0.0–5.0" high water content, fine silt, soupy, uniform consistency and texture	5Y 2.5/2 black
					5.0–117.0" moderate water content, silty clay, smooth, peanut butter like, uniform consistency and texture	5Y 3/2 dark olive gray

^a. Coordinates are based on NAD83 State Plane Texas South Central System (feet).

^b. Sediment core samples are measured in inches with zero representing the current bottom surface.

Table 2 (continued). Sediment core sample analysis data.

Sediment core sample	Easting ^a (feet)	Northing ^a (feet)	Total core sample / post-impoundment sediment length (inches)	Sediment core description ^b		Munsell soil color
CCR-11	2179000.50	13372261.20	22.0 / 20.0	post-impoundment	0.0–2.0" high water content, fine silt, soupy, uniform consistency and texture	5Y 3/2 dark olive gray
					2.0–20.0" high to moderate water content, water content decreases with depth, silty clay, pudding like, density increases with depth	5Y 3/2 dark olive gray
				pre-impoundment	20.0–22.0" moderate water content, clay, easily crumbles, malleable (can form ribbons), organic materials present throughout (fibrous and dendritic roots, terrestrial vegetation, leaf litter)	5Y 2.5/1 black
CCR-12	2201864.53	13369191.54	30.0 / 23.0	post-impoundment	0.0–23.0" high to moderate water content, water content increases with depth, silty clay, smooth, pudding like, uniform consistency and texture	5Y 3/2 dark olive gray
				pre-impoundment	23.0–30.0" low water content, clay, easily crumbles, organic materials present throughout (fibrous roots, terrestrial vegetation and snail shell found)	5Y 2.5/2 black
CCR-13	2171117.85	13360853.89	90.0 / N/A	post-impoundment	0.0–2.0" high water content, fine silt, soupy, smooth, uniform consistency and texture	5Y 2.5/1 black
					2.0–90.0" high to low water content, water content decreases with depth, silty clay, smooth, density increases with depth, pudding like to peanut butter like consistency with increases in depth	5Y 3/1 very dark gray
CCR-14	2196218.83	13361763.72	100.0 / 96.0	post-impoundment	0.0–96.0" moderate water content, silty clay, peanut butter like, density increases with depth, uniform consistency and texture	5Y 3/2 dark olive gray
				pre-impoundment	96.0–100.0" low water content, clay, malleable, easily crumbles, not very dense, organic materials present (fibrous roots and terrestrial vegetation)	5Y 2.5/1 black
CCR-15	2209708.21	13360401.60	112.0 / N/A	post-impoundment	0.0–4.0" very high water content, fine silt, soupy, uniform consistency and texture	5Y 2.5/2 black

^a. Coordinates are based on NAD83 State Plane Texas South Central System (feet).

^b. Sediment core samples are measured in inches with zero representing the current bottom surface.

Table 2 (continued). Sediment core sample analysis data.

Sediment core sample	Easting ^a (feet)	Northing ^a (feet)	Total core sample / post-impoundment sediment length (inches)	Sediment core description ^b		Munsell soil color
CCR-15 (cont.)	2209708.21	13360401.60	112.0 / N/A	post-impoundment	4.0–112.0" high to moderate water content, water content decrease with depth, silty clay, smooth, pudding like to peanut butter like, density increases with depth	5Y 3/2 dark olive gray
CCR-16	2204910.98	13358857.50	78.0 / 60.0	post-impoundment	0.0–5.0" high water content, fine silt, soupy, uniform consistency and texture	5Y 2.5/2 black
					5.0–20.0" high water content, silty clay, smooth, pudding like uniform consistency and texture	2.5Y 3/2 very dark grayish brown
					20.0–56.0" moderate water content, silty clay, smooth, pudding like, uniform consistency and texture	5Y 3/2 dark olive gray
					56.0–60.0" low water content, silty sand, fine sand	5Y 4/1 dark gray
				pre-impoundment	60.0–78.0" low water content, fine sand, very coarse rock and bits of clay present, organic material present (fibrous roots)	2.5Y 6/1 gray
CCR-17	2193856.45	13354189.61	28.0 / 23.0	post-impoundment	0.0–2.0" high water content, fine silt, soupy, very fine bits of clay present	5Y 3/2 dark olive gray
					2.0–23.0" high to moderate water content, water content decreases with depth, silty clay, pudding like, very fine to medium sized bits of clay present, density increases with depth	5Y 3/2 dark olive gray
				pre-impoundment	23.0–28.0" moderate to low water content, clay, malleable, easily crumbles, organic material present throughout (fibrous roots)	5Y 2.5/1 black
CCR-Alt8	2175631.87	13359432.65	47.0 / 38.0	post-impoundment	0.0–2.0" high water content, fine silt	5Y 2.5/2 black

^a. Coordinates are based on NAD83 State Plane Texas South Central System (feet).

^b. Sediment core samples are measured in inches with zero representing the current bottom surface.

Table 2 (continued). Sediment core sample analysis data.

Sediment core sample	Easting^a (feet)	Northing^a (feet)	Total core sample / post-impoundment sediment length (inches)	Sediment core description^b		Munsell soil color
CCR-Alt8 (cont.)	2175631.87	13359432.65	47.0 / 38.0	post-impoundment	2.0–38.0" moderate water content, silty clay, smooth, pudding like, density increases with depth	5Y 2.5/2 black
				pre-impoundment	38.0–47.0" low water content, clay, malleable, easily fractures, density increases with depth, organic material present (fibrous roots near top of layer)	5Y 2.5/1 black

^{a.} Coordinates are based on NAD83 State Plane Texas South Central System (feet).

^{b.} Sediment core samples are measured in inches with zero representing the current bottom surface.

Sediment core locations are dispersed throughout the reservoir, selected to represent the various acoustic signatures seen in the data, and chosen to represent various depths and topographical features such as the submerged river channels, floodplains, shallow slopes, and deep basins. The pre-impoundment surface is identified by matching each sediment core with the acoustic signal returns. This information then serves as a guide for identifying the pre-impoundment surface along cross-sections where sediment core samples were not collected.

A photograph of sediment core 16 (for location, refer to Figure 2) is shown in Figure 7. The base, or deepest part of the sample, is denoted by the blue line. The pre-impoundment boundary (yellow line closest to the base) was evident within this sediment core sample at 60 inches and identified by the change in color, texture, moisture, porosity, and structure. Identification of the pre-impoundment surface for each sediment core followed a similar procedure.

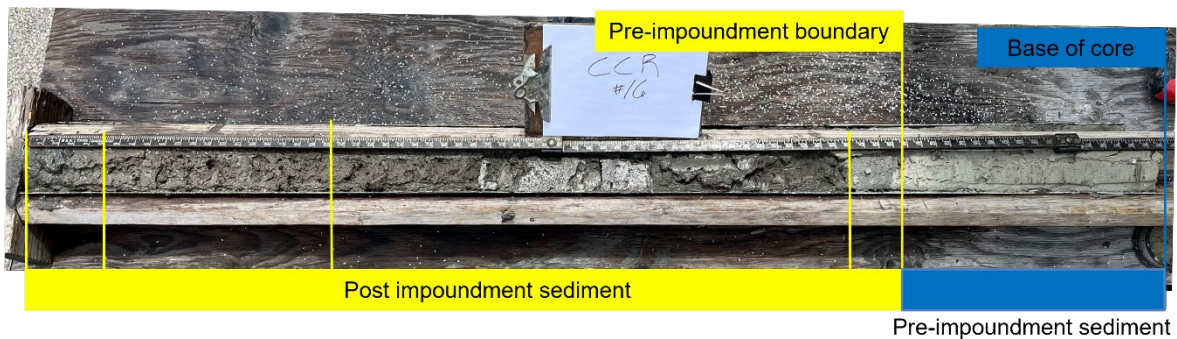


Figure 7. Sediment core CCR-16. Post-impoundment sediment layers occur in the top 60 inches of this sediment core (identified by the yellow box). Pre-impoundment sediment layers were identified and are defined by the blue box.

Figure 8 illustrates the relationship between acoustic signal returns and the depositional layering seen in sediment cores. In this example, sediment core CCR-16 is shown correlated with each frequency: 200 kHz, 50 kHz, and 12 kHz. The current bathymetric surface is determined based on signal returns from the 200 kHz transducer as represented by the top red line in Figure 8. The pre-impoundment surface is identified by comparing boundaries observed in the 200 kHz, 50 kHz, and 12 kHz signals to the location of the pre-impoundment surface of the sediment core sample. Many layers of sediment may be identified during analysis based on changes in observed characteristics such as water content, organic matter content, and sediment particle size, and each layer is classified as either post-impoundment or pre-impoundment. Yellow boxes represent post-impoundment

sediments identified in the sediment core. Blue boxes indicate pre-impoundment sediments.

In this example, the pre-impoundment boundary in sediment core CCR-16 most closely aligned with the bottom of the 50 kHz acoustic returns (Figure 8).

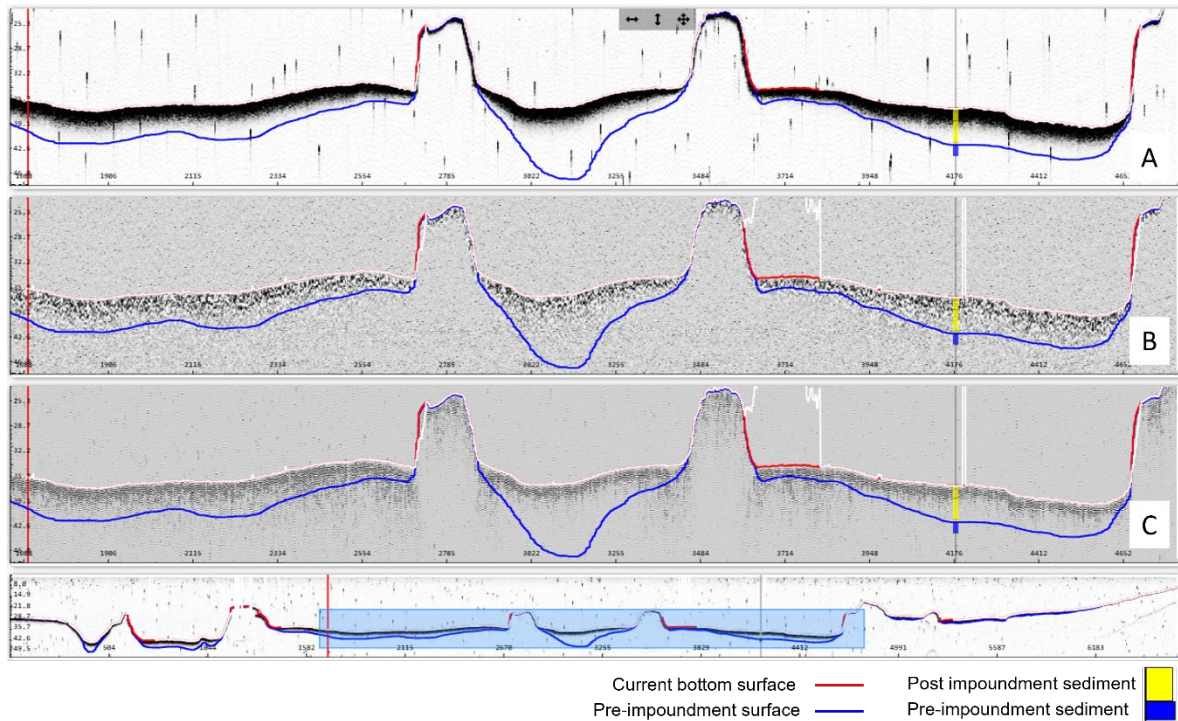


Figure 8. Sediment core sample CCR-16 compared with acoustic signal returns: A) 200 kHz frequency, B) 50 kHz frequency, and C) 12 kHz frequency.

After the pre-impoundment surface for all cross-sections is identified, a pre-impoundment TIN model and a sediment thickness TIN model are created. Pre-impoundment elevations and sediment thicknesses are interpolated between surveyed cross-sections using HydroTools with the same interpolation definition file used for bathymetric interpolation. For the purposes of TIN model creation, the TWDB assumed the sediment thickness for each lidar point and the reservoir boundary was zero feet (defined as the 190.0-foot elevation contour). The sediment thickness TIN model was converted to a raster representation using a cell size of 2 feet by 2 feet and was used to produce a sediment thickness map (Figure 9). Elevation-capacity and elevation-area tables were computed from the pre-impoundment TIN model for the purpose of calculating the total volume of accumulated sediment.

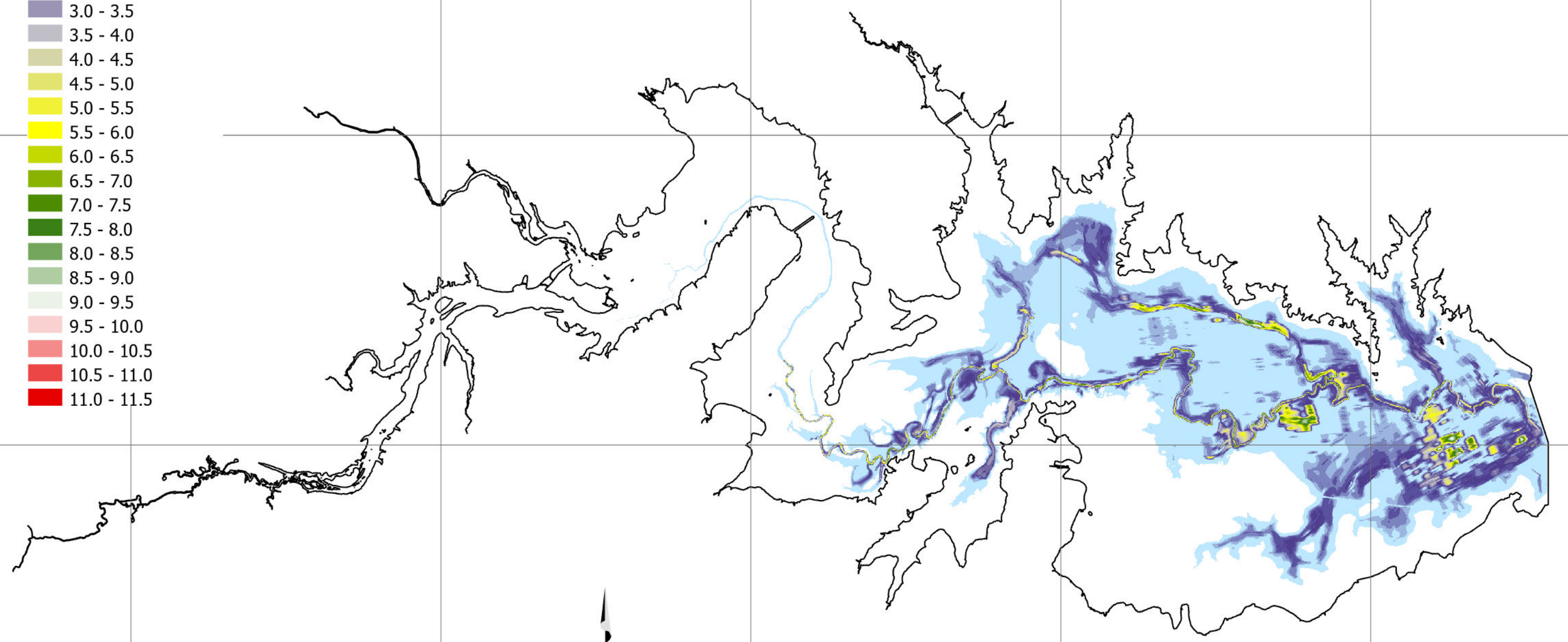
Figure 9

Choke Canyon Reservoir

Sediment thickness map

Sediment thickness
(feet)

- 0.0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- 6.0 - 6.5
- 6.5 - 7.0
- 7.0 - 7.5
- 7.5 - 8.0
- 8.0 - 8.5
- 8.5 - 9.0
- 9.0 - 9.5
- 9.5 - 10.0
- 10.0 - 10.5
- 10.5 - 11.0
- 11.0 - 11.5



Conservation pool
elevation 220.5 feet

Projection: NAD83 State Plane
Texas South Central Zone (feet)



August - October 2024 Survey

Survey results

Volumetric survey

The 2024 TWDB volumetric survey indicates Choke Canyon Reservoir has a total reservoir capacity of 669,186 acre-feet and encompasses 25,510 acres at conservation pool elevation (220.5 feet NGVD29). Current area and capacity estimates are presented along with previous estimates of area and capacity at conservation pool elevation in Table 3 and at elevation 190.0 feet in Table 4. Elevation 190.0 feet is the extent of the TWDB 2024 bathymetric survey. Because differences in reservoir conditions as well as differences in the methodologies used among surveys can affect area and volume calculations, the TWDB does not recommend comparing between volumetric surveys to determine loss of area or capacity. Information from past surveys is thus presented for informational purposes only.

Table 3. Current and previous survey capacity and surface area estimates at conservation pool elevation.

Survey	Surface Area (acres)	Total Capacity (acre-feet)	Conservation Pool Elevation ^a	Source
Certificate of Adjudication 21-3214	N/A	700,000	220.5	Texas Commission on Environmental Quality, 1984
U.S. Bureau of Reclamation 1983	25,989	695,125	220.5	Texas Water Development Board, 2026
TWDB 1993	25,989	695,271	220.5	Texas Water Development Board, 2003
TWDB 2012	25,438	662,821	220.5	Texas Water Development Board, 2013
TWDB 2024	25,510	669,186	220.5	

^a. Feet National Geodetic Vertical Datum 1929 (NGVD29).

Table 4. Current and previous survey capacity and surface area estimates at elevation 190.0 feet.

Survey	Surface Area (acres)	Total Capacity (acre-feet)	Elevation ^a	Source
U.S. Bureau of Reclamation 1983	10,307	149,665	190.0	Texas Water Development Board, 2026
TWDB 1993	10,307	149,580	190.0	Texas Water Development Board, 2003
TWDB 2012	9,924	134,948	190.0	Texas Water Development Board, 2013
TWDB 2024	10,032	133,961	190.0	

^a. Feet National Geodetic Vertical Datum 1929 (NGVD29).

The 2024 TWDB sedimentation survey measured 9,489 acre-feet of sediment below elevation 185.0 feet. Elevation 185.0 feet is the maximum elevation with sufficient coverage by the 2024 TWDB survey data for accurate comparison against previous sedimentation surveys. The sedimentation survey indicates sediment accumulation is greatest within the submerged river channels throughout the reservoir. Comparison of annual capacity loss estimates of Choke Canyon Reservoir derived using differing methodologies are provided in Tables 5 and 6 for sedimentation rate calculation.

Any changes to the hydrologic system that contributes runoff to the reservoir, including changes in vegetative cover, land use, or frequency and intensity of rainfall events, can impact the local rate of sedimentation. Because methodological and technological changes from one survey to the next yield inconsistencies in estimates of capacity loss rates, long term capacity calculations, computed by plotting all capacity estimates and calculating a linear regression line, reduces the effect of individual survey error. As illustrated in Figure 10, long-term trends indicate Choke Canyon Reservoir loses capacity at an average of 819 acre-feet per year since impoundment due to sedimentation below conservation pool elevation (220.5 feet NGVD29). As illustrated in Figure 11, long-term trends indicate Choke Canyon Reservoir loses capacity at an average of 386 acre-feet per year since impoundment due to sedimentation below elevation 185.0 feet.

Table 5. Average annual capacity loss comparisons at conservation pool elevation 220.5 feet^a

Previous surveys	U.S. Bureau of Reclamation 1983	TWDB 1993	TWDB 2012
Volume difference versus TWDB 2024 survey (acre-feet)	25,939	26,085	-6,365
Percent change	3.7	3.8	-1.0
Number of years^b	41	31	12
Capacity loss rate (acre-feet/year)	633	841	-530
Capacity loss rate (acre-feet/square mile of drainage area of 5,490 square miles/year)	0.12	0.15	-0.10

^a. National Geodetic Vertical Datum 1929 (NGVD29).

^b. Note: Choke Canyon Dam was considered substantially complete on May 18, 1982, and the official dedication ceremony was held on June 8, 1982 (USBR, 2013).

Table 6. Average annual capacity loss comparisons at elevation 185.0 feet^c

Previous surveys	U.S. Bureau of Reclamation 1983	TWDB 1993	TWDB 2012	TWDB 2024 pre-impoundment capacity below elevation 185.0 feet
Volume difference versus TWDB 2024 survey (acre-feet)	13,487	13,553	1,211	9,489
Percent change	13.1	13.2	1.3	9.6
Number of years^d	41	31	12	42
Capacity loss rate (acre-feet/year)	329	437	101	226
Capacity loss rate (acre-feet/square mile of drainage area of 5,490 square miles/year)	0.06	0.08	0.02	0.04

^c. National Geodetic Vertical Datum 1929 (NGVD29).

^d. Note: Choke Canyon Dam was considered substantially complete on May 18, 1982, and the official dedication ceremony was held on June 8, 1982 (USBR, 2013).

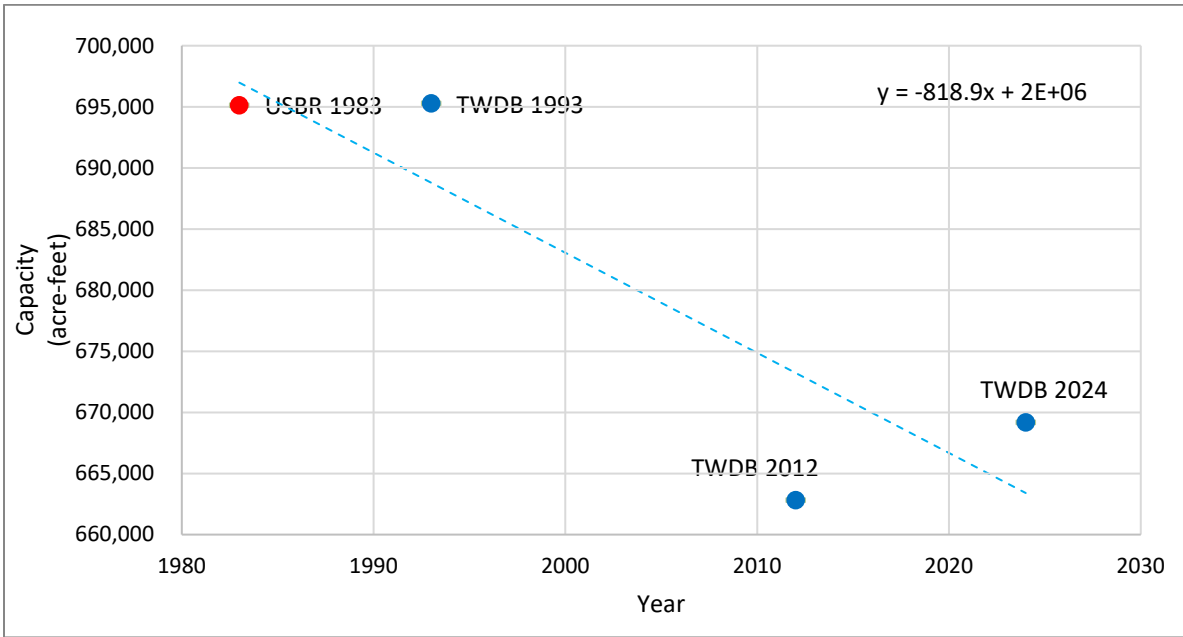


Figure 10. Plot of current and previous capacity estimates (acre-feet) at conservation pool elevation. Capacity estimates for each TWDB survey plotted as blue dots and other surveys as red dots. The blue trend line illustrates the total average loss of capacity through 2024.

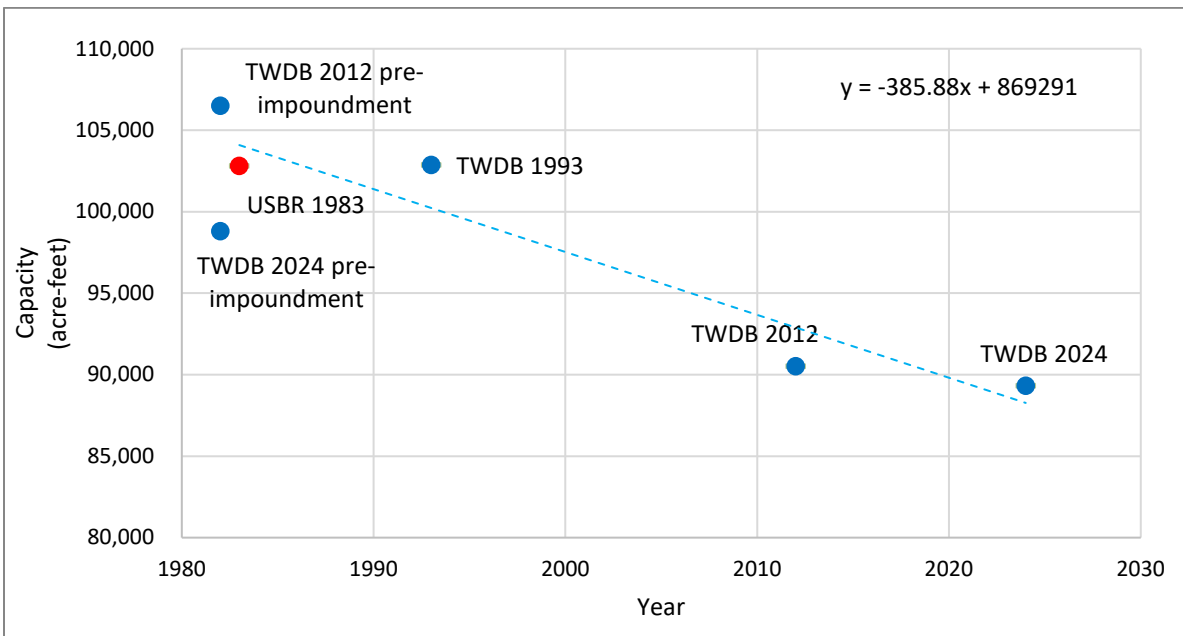


Figure 11. Plot of current and previous capacity estimates (acre-feet) at elevation 185.0 feet. Capacity estimates for each TWDB survey plotted as blue dots and other surveys as red dots. The blue trend line illustrates the total average loss of capacity through 2024.

Recommendations

Sedimentation processes tend to be slow, with changes accumulating over the time frame of years—unless in the event of a major flood, for example. For these reasons, we recommend reservoir sedimentation surveys be conducted every 10 years or after a major event. Closely monitoring changes in the reservoir provides information needed to plan for a secure water supply for the future.

TWDB contact information

For more information about the TWDB Hydrographic Survey Program, visit www.twdb.texas.gov/surfacewater/surveys. Any questions regarding the TWDB Hydrographic Survey Program or this report may be addressed to: Hydrosurvey@twdb.texas.gov.

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Appendix A

Choke Canyon Reservoir

RESERVOIR BATHYMETRIC CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD

August - October 2024 Survey

CAPACITY IN ACRE-FEET

Conservation Pool Elevation 220.5 feet NGVD29

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION (Feet NGVD29)	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
140	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	1	1	1	1	1
142	1	1	2	2	2	2	3	3	3	3
143	4	4	4	5	5	5	6	6	7	7
144	8	8	9	10	11	12	13	14	15	16
145	18	19	21	22	24	26	28	30	32	34
146	36	38	41	43	46	49	52	56	59	62
147	66	70	74	78	82	86	91	96	100	105
148	111	116	121	127	133	138	144	150	156	162
149	169	175	182	188	195	202	209	216	224	231
150	239	247	255	263	272	280	289	298	307	317
151	326	336	346	356	366	377	387	398	409	421
152	433	445	457	470	484	497	512	527	542	558
153	574	591	608	625	643	662	680	700	719	739
154	760	781	802	824	846	868	891	915	939	963
155	988	1,013	1,039	1,065	1,091	1,118	1,145	1,173	1,201	1,230
156	1,259	1,288	1,318	1,348	1,378	1,409	1,440	1,472	1,504	1,537
157	1,570	1,603	1,637	1,671	1,706	1,742	1,777	1,814	1,851	1,888
158	1,926	1,965	2,005	2,044	2,085	2,126	2,168	2,210	2,253	2,297
159	2,341	2,386	2,431	2,477	2,524	2,573	2,622	2,672	2,722	2,774
160	2,827	2,881	2,936	2,991	3,048	3,106	3,166	3,226	3,288	3,351
161	3,415	3,481	3,548	3,616	3,686	3,757	3,830	3,903	3,978	4,053
162	4,131	4,209	4,289	4,371	4,454	4,539	4,624	4,712	4,800	4,890
163	4,982	5,075	5,170	5,266	5,364	5,464	5,565	5,668	5,774	5,881
164	5,990	6,101	6,214	6,328	6,445	6,563	6,683	6,806	6,930	7,056
165	7,184	7,314	7,446	7,580	7,716	7,854	7,993	8,134	8,277	8,422
166	8,569	8,718	8,868	9,020	9,174	9,329	9,486	9,645	9,806	9,969
167	10,134	10,300	10,468	10,639	10,812	10,986	11,163	11,341	11,521	11,703
168	11,886	12,073	12,261	12,452	12,646	12,843	13,042	13,244	13,448	13,654
169	13,862	14,073	14,286	14,502	14,720	14,942	15,166	15,393	15,623	15,856
170	16,092	16,331	16,573	16,817	17,064	17,314	17,567	17,824	18,083	18,346
171	18,612	18,882	19,155	19,430	19,708	19,989	20,274	20,561	20,851	21,144
172	21,440	21,740	22,042	22,349	22,657	22,969	23,284	23,602	23,923	24,247
173	24,574	24,904	25,237	25,574	25,914	26,257	26,603	26,953	27,307	27,663
174	28,022	28,385	28,750	29,118	29,490	29,864	30,241	30,621	31,004	31,391
175	31,781	32,174	32,570	32,970	33,373	33,778	34,187	34,599	35,014	35,432
176	35,853	36,277	36,703	37,133	37,565	38,000	38,438	38,879	39,323	39,770
177	40,220	40,675	41,132	41,593	42,058	42,526	42,997	43,472	43,951	44,433
178	44,919	45,408	45,901	46,399	46,901	47,409	47,921	48,438	48,959	49,485
179	50,015	50,550	51,089	51,632	52,179	52,731	53,286	53,846	54,409	54,976
180	55,547	56,122	56,701	57,285	57,873	58,465	59,061	59,661	60,266	60,876
181	61,489	62,106	62,728	63,353	63,982	64,615	65,251	65,892	66,537	67,186
182	67,840	68,497	69,159	69,826	70,497	71,172	71,850	72,533	73,218	73,908
183	74,601	75,298	75,998	76,703	77,411	78,123	78,838	79,558	80,282	81,010
184	81,742	82,479	83,221	83,966	84,717	85,471	86,229	86,992	87,760	88,531
185	89,307	90,086	90,870	91,658	92,450	93,245	94,045	94,848	95,655	96,467
186	97,282	98,102	98,926	99,755	100,589	101,427	102,271	103,120	103,975	104,836
187	105,704	106,578	107,459	108,347	109,240	110,138	111,041	111,948	112,859	113,775
188	114,695	115,620	116,549	117,482	118,419	119,359	120,304	121,253	122,206	123,163
189	124,125	125,091	126,061	127,034	128,012	128,994	129,979	130,969	131,962	132,959
190	133,960	134,966	135,975	136,988	138,004	139,025	140,049	141,078	142,111	143,147

Appendix A (Continued)
Choke Canyon Reservoir

RESERVOIR BATHYMETRIC CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD

August - October 2024 Survey

CAPACITY IN ACRE-FEET

Conservation Pool Elevation 220.5 feet NGVD29

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION (Feet NGVD29)	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
191	144,189	145,235	146,285	147,340	148,400	149,464	150,532	151,605	152,681	153,762
192	154,846	155,935	157,027	158,123	159,222	160,325	161,432	162,542	163,657	164,776
193	165,899	167,027	168,160	169,297	170,439	171,585	172,736	173,891	175,050	176,214
194	177,382	178,555	179,732	180,914	182,100	183,290	184,485	185,686	186,891	188,101
195	189,316	190,537	191,763	192,994	194,231	195,473	196,721	197,974	199,233	200,497
196	201,766	203,039	204,317	205,600	206,887	208,179	209,475	210,776	212,082	213,392
197	214,707	216,027	217,351	218,680	220,013	221,351	222,693	224,040	225,390	226,745
198	228,104	229,467	230,835	232,207	233,584	234,966	236,354	237,747	239,146	240,551
199	241,963	243,381	244,806	246,238	247,677	249,124	250,578	252,039	253,508	254,984
200	256,467	257,956	259,452	260,953	262,460	263,973	265,491	267,014	268,543	270,078
201	271,619	273,165	274,718	276,278	277,843	279,414	280,991	282,574	284,163	285,758
202	287,358	288,964	290,575	292,192	293,813	295,440	297,071	298,707	300,347	301,991
203	303,640	305,293	306,950	308,612	310,279	311,950	313,626	315,307	316,992	318,682
204	320,377	322,076	323,780	325,487	327,199	328,915	330,635	332,359	334,086	335,818
205	337,554	339,294	341,038	342,787	344,540	346,297	348,059	349,825	351,596	353,371
206	355,152	356,937	358,726	360,521	362,320	364,125	365,934	367,749	369,570	371,397
207	373,230	375,069	376,914	378,764	380,621	382,484	384,352	386,226	388,104	389,988
208	391,877	393,770	395,669	397,572	399,480	401,392	403,309	405,231	407,157	409,087
209	411,022	412,961	414,905	416,854	418,807	420,765	422,727	424,695	426,668	428,645
210	430,628	432,616	434,609	436,608	438,611	440,620	442,634	444,653	446,677	448,707
211	450,741	452,780	454,824	456,873	458,926	460,985	463,049	465,118	467,192	469,271
212	471,356	473,446	475,542	477,642	479,749	481,860	483,977	486,100	488,228	490,361
213	492,499	494,643	496,791	498,945	501,104	503,268	505,437	507,611	509,791	511,977
214	514,168	516,365	518,567	520,775	522,989	525,209	527,435	529,667	531,905	534,149
215	536,399	538,656	540,919	543,189	545,465	547,747	550,036	552,332	554,634	556,942
216	559,258	561,579	563,908	566,243	568,584	570,930	573,283	575,642	578,006	580,376
217	582,751	585,132	587,519	589,911	592,308	594,710	597,118	599,531	601,949	604,372
218	606,801	609,234	611,673	614,118	616,568	619,023	621,484	623,950	626,422	628,900
219	631,383	633,871	636,364	638,863	641,366	643,874	646,386	648,903	651,425	653,950
220	656,480	659,013	661,551	664,092	666,637	669,186				

Appendix B
Choke Canyon Reservoir
RESERVOIR BATHYMETRIC AREA TABLE

TEXAS WATER DEVELOPMENT BOARD

August - October 2024 Survey

AREA IN ACRES

Conservation Pool Elevation 220.5 feet NGVD29

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION (Feet NGVD29)	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
140	0	0	0	0	0	0	0	0	0	0
141	1	1	1	1	1	1	1	1	2	2
142	2	2	2	2	2	3	3	3	3	3
143	3	3	3	3	3	4	4	4	5	5
144	6	7	8	8	10	10	11	12	12	13
145	14	15	16	16	17	18	19	20	21	22
146	23	24	25	27	29	30	32	33	34	36
147	37	39	40	41	43	44	46	47	49	51
148	52	54	55	56	57	58	59	60	61	62
149	64	65	66	67	69	70	71	73	75	76
150	78	80	82	84	86	87	89	91	93	95
151	96	98	100	102	104	106	108	111	114	116
152	119	123	127	131	136	141	146	151	156	161
153	165	169	173	177	181	186	190	194	198	202
154	207	211	215	219	223	228	232	237	241	246
155	250	254	259	263	267	271	275	279	283	287
156	291	295	299	303	307	311	315	319	323	328
157	332	337	341	346	351	355	360	367	373	379
158	384	391	397	402	408	414	420	426	432	438
159	445	451	459	467	476	486	495	504	514	524
160	533	542	553	563	575	586	598	611	623	637
161	651	664	677	692	704	716	729	740	752	765
162	780	793	808	823	838	852	865	879	894	909
163	924	939	955	970	987	1,005	1,024	1,042	1,062	1,082
164	1,101	1,120	1,137	1,155	1,173	1,192	1,213	1,234	1,253	1,271
165	1,291	1,311	1,330	1,348	1,366	1,384	1,402	1,422	1,440	1,458
166	1,478	1,496	1,513	1,529	1,546	1,562	1,580	1,600	1,618	1,637
167	1,655	1,674	1,695	1,715	1,736	1,755	1,773	1,791	1,809	1,828
168	1,849	1,873	1,897	1,924	1,956	1,981	2,006	2,028	2,050	2,072
169	2,096	2,120	2,145	2,171	2,198	2,225	2,257	2,285	2,316	2,347
170	2,376	2,404	2,430	2,457	2,484	2,515	2,547	2,580	2,612	2,648
171	2,679	2,710	2,741	2,768	2,798	2,827	2,857	2,887	2,916	2,947
172	2,978	3,009	3,045	3,075	3,104	3,133	3,164	3,195	3,225	3,255
173	3,285	3,316	3,348	3,381	3,415	3,450	3,483	3,515	3,550	3,580
174	3,609	3,638	3,668	3,697	3,726	3,755	3,785	3,817	3,850	3,882
175	3,915	3,947	3,981	4,012	4,043	4,074	4,105	4,135	4,164	4,192
176	4,223	4,251	4,280	4,308	4,335	4,365	4,395	4,425	4,456	4,488
177	4,522	4,559	4,594	4,628	4,664	4,697	4,731	4,767	4,802	4,840
178	4,876	4,914	4,953	4,998	5,050	5,100	5,146	5,190	5,235	5,280
179	5,325	5,368	5,411	5,453	5,493	5,533	5,574	5,615	5,654	5,691
180	5,729	5,770	5,812	5,857	5,899	5,941	5,984	6,029	6,072	6,114
181	6,153	6,192	6,232	6,272	6,309	6,346	6,386	6,430	6,471	6,512
182	6,555	6,598	6,644	6,688	6,728	6,768	6,805	6,841	6,877	6,912
183	6,949	6,987	7,024	7,062	7,100	7,139	7,177	7,217	7,258	7,303
184	7,347	7,391	7,435	7,480	7,522	7,564	7,607	7,652	7,693	7,735
185	7,776	7,817	7,858	7,898	7,937	7,975	8,014	8,053	8,093	8,133
186	8,176	8,219	8,265	8,313	8,360	8,411	8,466	8,521	8,581	8,644
187	8,709	8,777	8,845	8,905	8,956	9,003	9,048	9,093	9,137	9,181
188	9,224	9,267	9,310	9,350	9,389	9,428	9,467	9,509	9,552	9,594
189	9,637	9,679	9,719	9,759	9,798	9,836	9,874	9,913	9,952	9,992
190	10,032	10,071	10,110	10,148	10,187	10,225	10,264	10,305	10,348	10,391

Appendix B (Continued)
Choke Canyon Reservoir
RESERVOIR BATHYMETRIC AREA TABLE

TEXAS WATER DEVELOPMENT BOARD

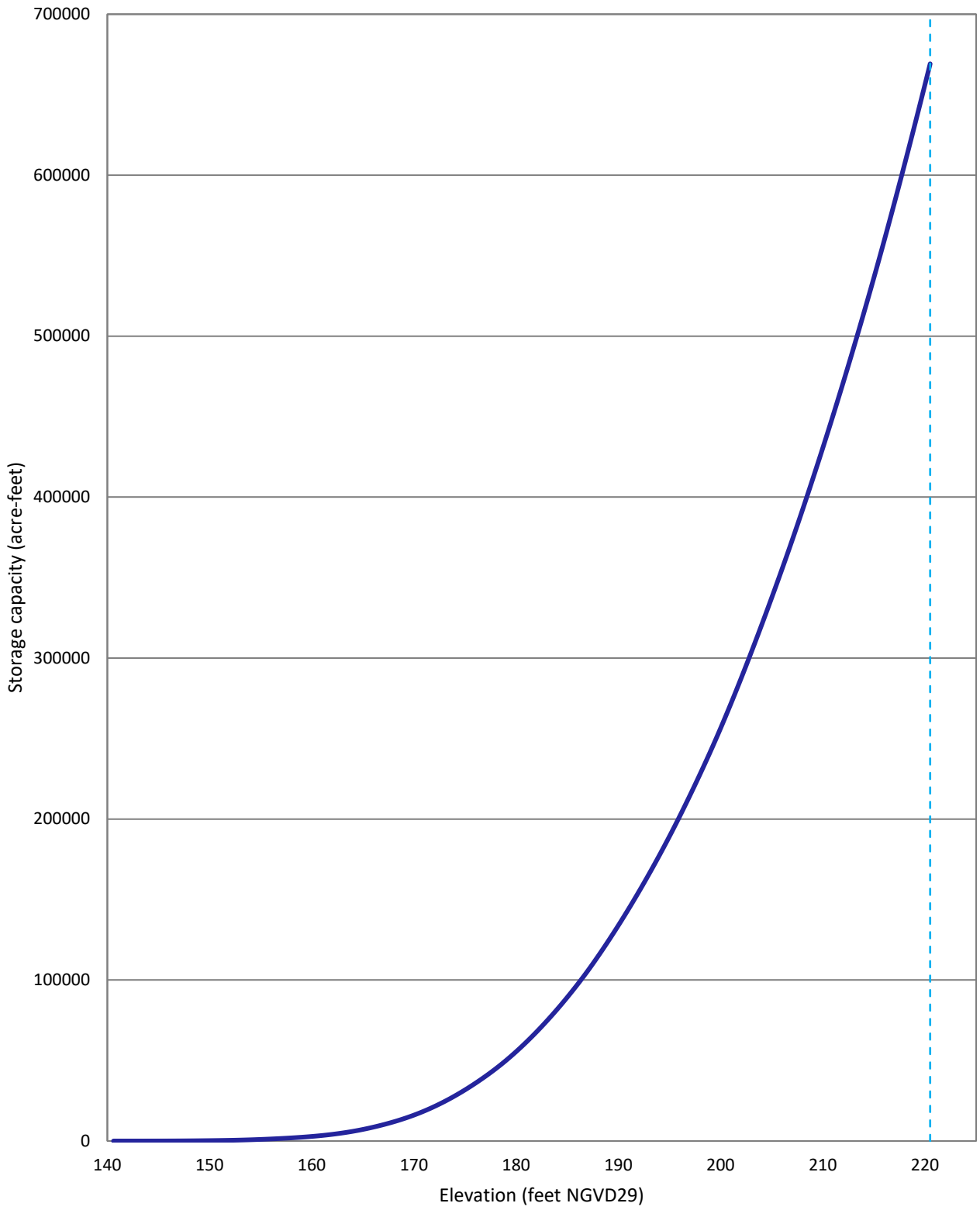
August - October 2024 Survey

AREA IN ACRES

Conservation Pool Elevation 220.5 feet NGVD29

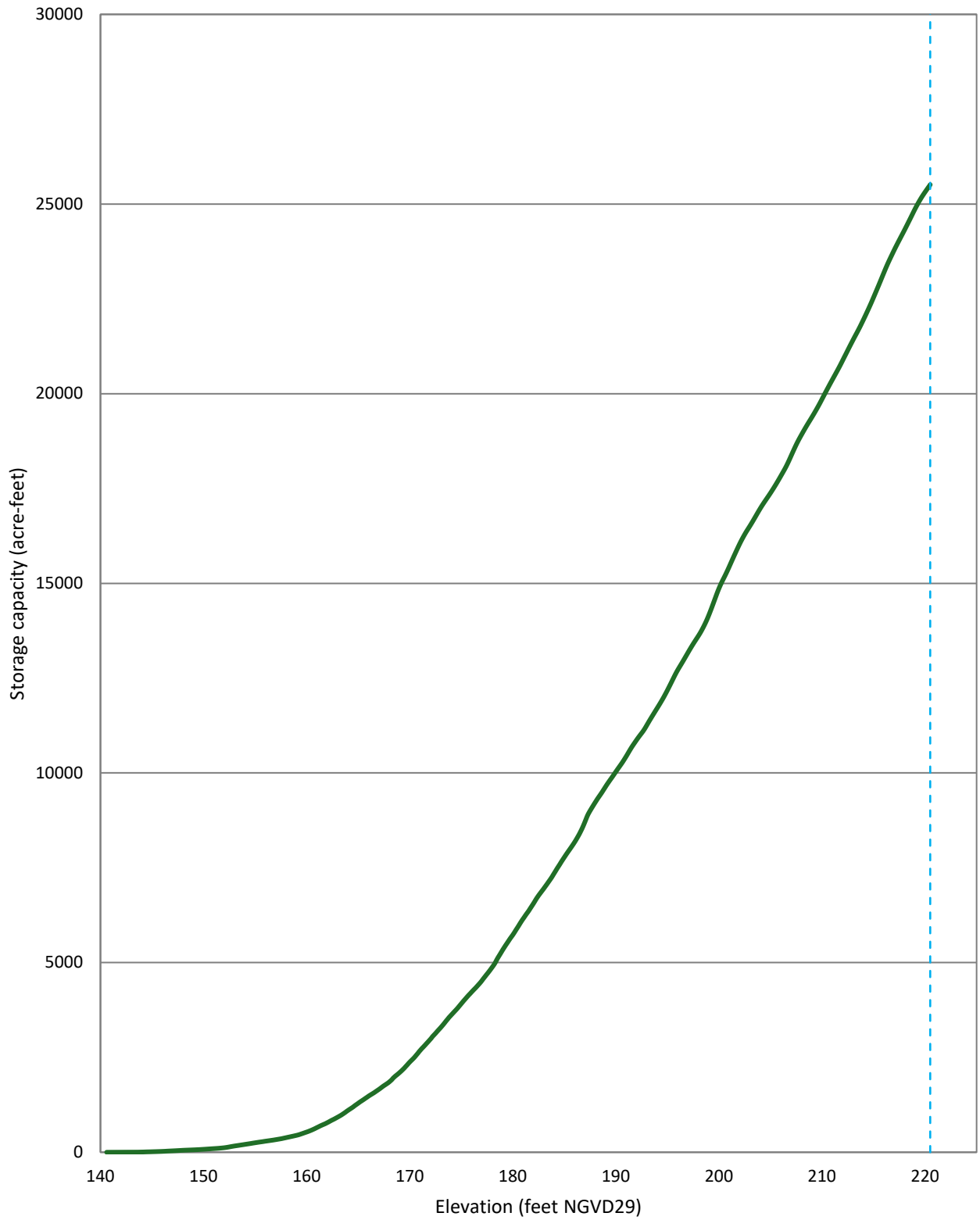
ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION (Feet NGVD29)	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
191	10,435	10,481	10,527	10,573	10,619	10,663	10,705	10,746	10,786	10,825
192	10,865	10,903	10,941	10,977	11,013	11,048	11,084	11,123	11,165	11,210
193	11,257	11,303	11,350	11,396	11,441	11,485	11,529	11,573	11,617	11,661
194	11,704	11,748	11,792	11,837	11,883	11,929	11,977	12,026	12,076	12,127
195	12,179	12,233	12,286	12,341	12,395	12,450	12,506	12,560	12,613	12,664
196	12,712	12,759	12,804	12,849	12,894	12,940	12,986	13,033	13,080	13,127
197	13,174	13,220	13,266	13,312	13,356	13,400	13,443	13,485	13,526	13,568
198	13,610	13,654	13,699	13,747	13,797	13,849	13,904	13,960	14,020	14,082
199	14,147	14,215	14,285	14,357	14,429	14,503	14,577	14,651	14,724	14,795
200	14,862	14,925	14,986	15,043	15,098	15,151	15,206	15,262	15,319	15,378
201	15,438	15,500	15,561	15,621	15,682	15,741	15,800	15,859	15,918	15,976
202	16,032	16,087	16,140	16,191	16,240	16,288	16,335	16,380	16,423	16,465
203	16,509	16,553	16,597	16,643	16,690	16,736	16,783	16,830	16,877	16,923
204	16,969	17,013	17,056	17,097	17,138	17,178	17,218	17,258	17,298	17,338
205	17,379	17,421	17,464	17,507	17,550	17,595	17,640	17,686	17,732	17,779
206	17,826	17,874	17,921	17,969	18,018	18,069	18,123	18,180	18,238	18,298
207	18,359	18,419	18,479	18,539	18,597	18,654	18,709	18,762	18,813	18,863
208	18,911	18,960	19,008	19,055	19,102	19,148	19,193	19,238	19,282	19,326
209	19,371	19,416	19,461	19,508	19,555	19,603	19,651	19,700	19,751	19,802
210	19,854	19,907	19,959	20,011	20,063	20,114	20,165	20,216	20,266	20,316
211	20,366	20,415	20,464	20,514	20,563	20,613	20,663	20,714	20,767	20,820
212	20,874	20,928	20,982	21,035	21,089	21,144	21,198	21,251	21,304	21,357
213	21,409	21,461	21,513	21,563	21,614	21,666	21,718	21,771	21,827	21,882
214	21,939	21,996	22,053	22,111	22,169	22,228	22,288	22,348	22,410	22,473
215	22,536	22,600	22,664	22,728	22,792	22,857	22,922	22,988	23,054	23,120
216	23,185	23,251	23,316	23,379	23,440	23,499	23,557	23,613	23,670	23,727
217	23,783	23,838	23,892	23,945	23,998	24,050	24,102	24,154	24,206	24,258
218	24,311	24,365	24,418	24,473	24,527	24,581	24,636	24,691	24,746	24,801
219	24,856	24,908	24,959	25,008	25,056	25,103	25,149	25,192	25,235	25,275
220	25,315	25,355	25,394	25,432	25,470	25,510				



— Total capacity 2024 - - - Conservation pool elevation 220.5 feet

Choke Canyon Reservoir
 August - October 2024 Survey
 Prepared by: TWDB



— Total area 2024 - - - Conservation pool elevation 220.5 feet

Choke Canyon Reservoir
 August - October 2024 Survey
 Prepared by: TWDB

Appendix E

Choke Canyon Reservoir

RESERVOIR BATHYMETRIC AND TOPOGRAPHIC CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD

August - October 2024 Survey

CAPACITY IN ACRE-FEET

Conservation Pool Elevation 220.5 feet NGVD29

ELEVATION INCREMENT IS ONE TENTH FOOT

Top of dam elevation 241.14 feet NGVD29

ELEVATION (Feet NGVD29)	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
140	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	1	1	1	1	1
142	1	1	2	2	2	2	3	3	3	3
143	4	4	4	5	5	5	6	6	7	7
144	8	8	9	10	11	12	13	14	15	16
145	18	19	21	22	24	26	28	30	32	34
146	36	38	41	43	46	49	52	56	59	62
147	66	70	74	78	82	86	91	96	100	105
148	111	116	121	127	133	138	144	150	156	162
149	169	175	182	188	195	202	209	216	224	231
150	239	247	255	263	272	280	289	298	307	317
151	326	336	346	356	366	377	387	398	409	421
152	433	445	457	470	484	497	512	527	542	558
153	574	591	608	625	643	662	680	700	719	739
154	760	781	802	824	846	868	891	915	939	963
155	988	1,013	1,039	1,065	1,091	1,118	1,145	1,173	1,201	1,230
156	1,259	1,288	1,318	1,348	1,378	1,409	1,440	1,472	1,504	1,537
157	1,570	1,603	1,637	1,671	1,706	1,742	1,777	1,814	1,851	1,888
158	1,926	1,965	2,005	2,044	2,085	2,126	2,168	2,210	2,253	2,297
159	2,341	2,386	2,431	2,477	2,524	2,573	2,622	2,672	2,722	2,774
160	2,827	2,881	2,936	2,991	3,048	3,106	3,166	3,226	3,288	3,351
161	3,415	3,481	3,548	3,616	3,686	3,757	3,830	3,903	3,978	4,053
162	4,131	4,209	4,289	4,371	4,454	4,539	4,624	4,712	4,800	4,890
163	4,982	5,075	5,170	5,266	5,364	5,464	5,565	5,668	5,774	5,881
164	5,990	6,101	6,214	6,328	6,445	6,563	6,683	6,806	6,930	7,056
165	7,184	7,314	7,446	7,580	7,716	7,854	7,993	8,134	8,277	8,422
166	8,569	8,718	8,868	9,020	9,174	9,329	9,486	9,645	9,806	9,969
167	10,134	10,300	10,468	10,639	10,812	10,986	11,163	11,341	11,521	11,703
168	11,886	12,073	12,261	12,452	12,646	12,843	13,042	13,244	13,448	13,654
169	13,862	14,073	14,286	14,502	14,720	14,942	15,166	15,393	15,623	15,856
170	16,092	16,331	16,573	16,817	17,064	17,314	17,567	17,824	18,083	18,346
171	18,612	18,882	19,155	19,430	19,708	19,989	20,274	20,561	20,851	21,144
172	21,440	21,740	22,042	22,349	22,657	22,969	23,284	23,602	23,923	24,247
173	24,574	24,904	25,237	25,574	25,914	26,257	26,603	26,953	27,307	27,663
174	28,022	28,385	28,750	29,118	29,490	29,864	30,241	30,621	31,004	31,391
175	31,781	32,174	32,570	32,970	33,373	33,778	34,187	34,599	35,014	35,432
176	35,853	36,277	36,703	37,133	37,565	38,000	38,438	38,879	39,323	39,770
177	40,220	40,675	41,132	41,593	42,058	42,526	42,997	43,472	43,951	44,433
178	44,919	45,408	45,901	46,399	46,901	47,409	47,921	48,438	48,959	49,485
179	50,015	50,550	51,089	51,632	52,179	52,731	53,286	53,846	54,409	54,976
180	55,547	56,122	56,701	57,285	57,873	58,465	59,061	59,661	60,266	60,876
181	61,489	62,106	62,728	63,353	63,982	64,615	65,251	65,892	66,537	67,186
182	67,840	68,497	69,159	69,826	70,497	71,172	71,850	72,533	73,218	73,908
183	74,601	75,298	75,998	76,703	77,411	78,123	78,838	79,558	80,282	81,010
184	81,742	82,479	83,221	83,966	84,717	85,471	86,229	86,992	87,760	88,531
185	89,307	90,086	90,870	91,658	92,450	93,245	94,045	94,848	95,655	96,467
186	97,282	98,102	98,926	99,755	100,589	101,427	102,271	103,120	103,975	104,836
187	105,704	106,578	107,459	108,347	109,240	110,138	111,040	111,948	112,859	113,775
188	114,695	115,620	116,549	117,482	118,419	119,359	120,304	121,253	122,206	123,163
189	124,125	125,091	126,060	127,034	128,012	128,994	129,979	130,969	131,962	132,959
190	133,960	134,965	135,975	136,987	138,004	139,025	140,049	141,078	142,110	143,147

Appendix F

Choke Canyon Reservoir

RESERVOIR BATHYMETRIC AND TOPOGRAPHIC AREA TABLE

TEXAS WATER DEVELOPMENT BOARD

August - October 2024 Survey

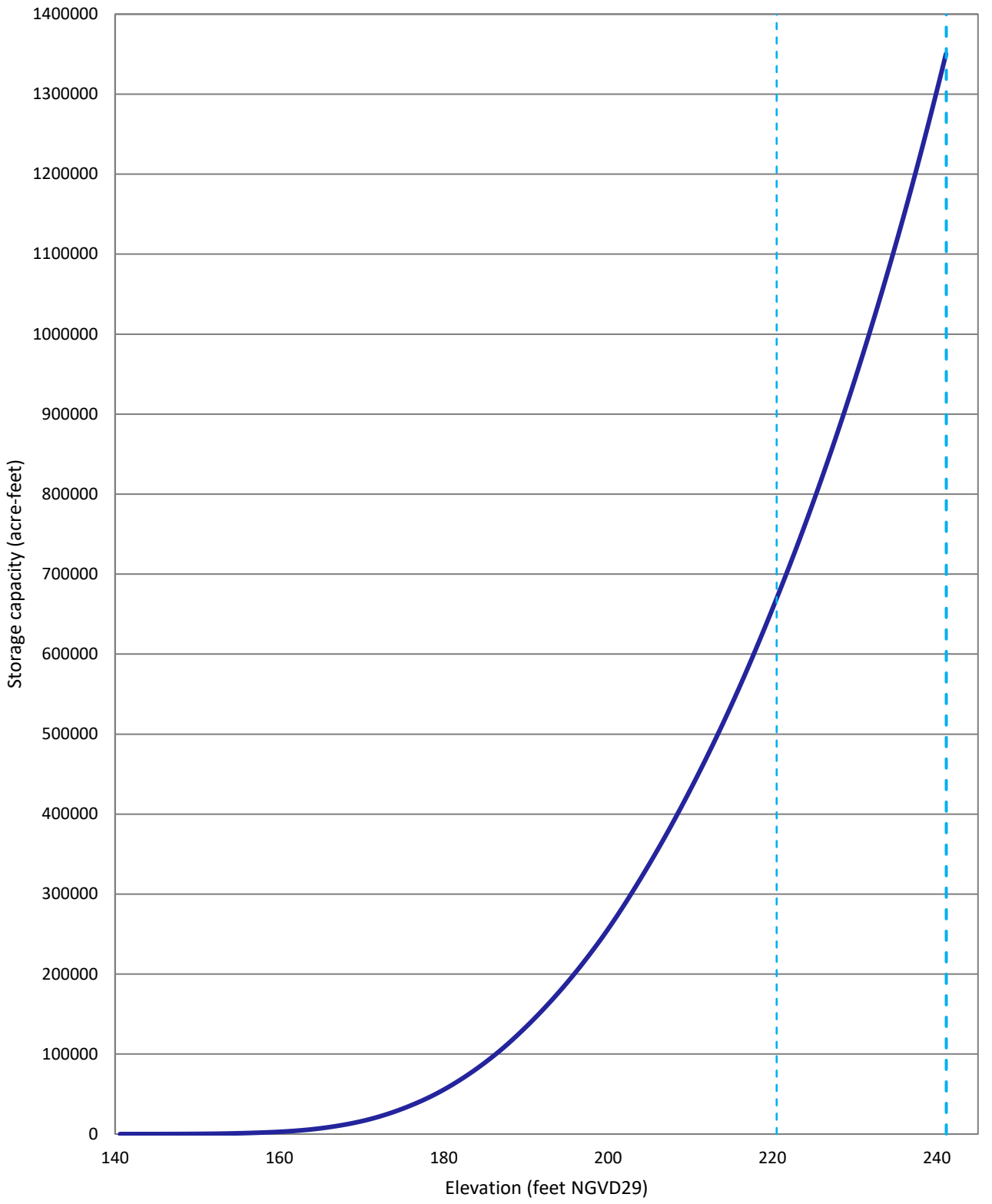
AREA IN ACRES

Conservation Pool Elevation 220.5 feet NGVD29

ELEVATION INCREMENT IS ONE TENTH FOOT

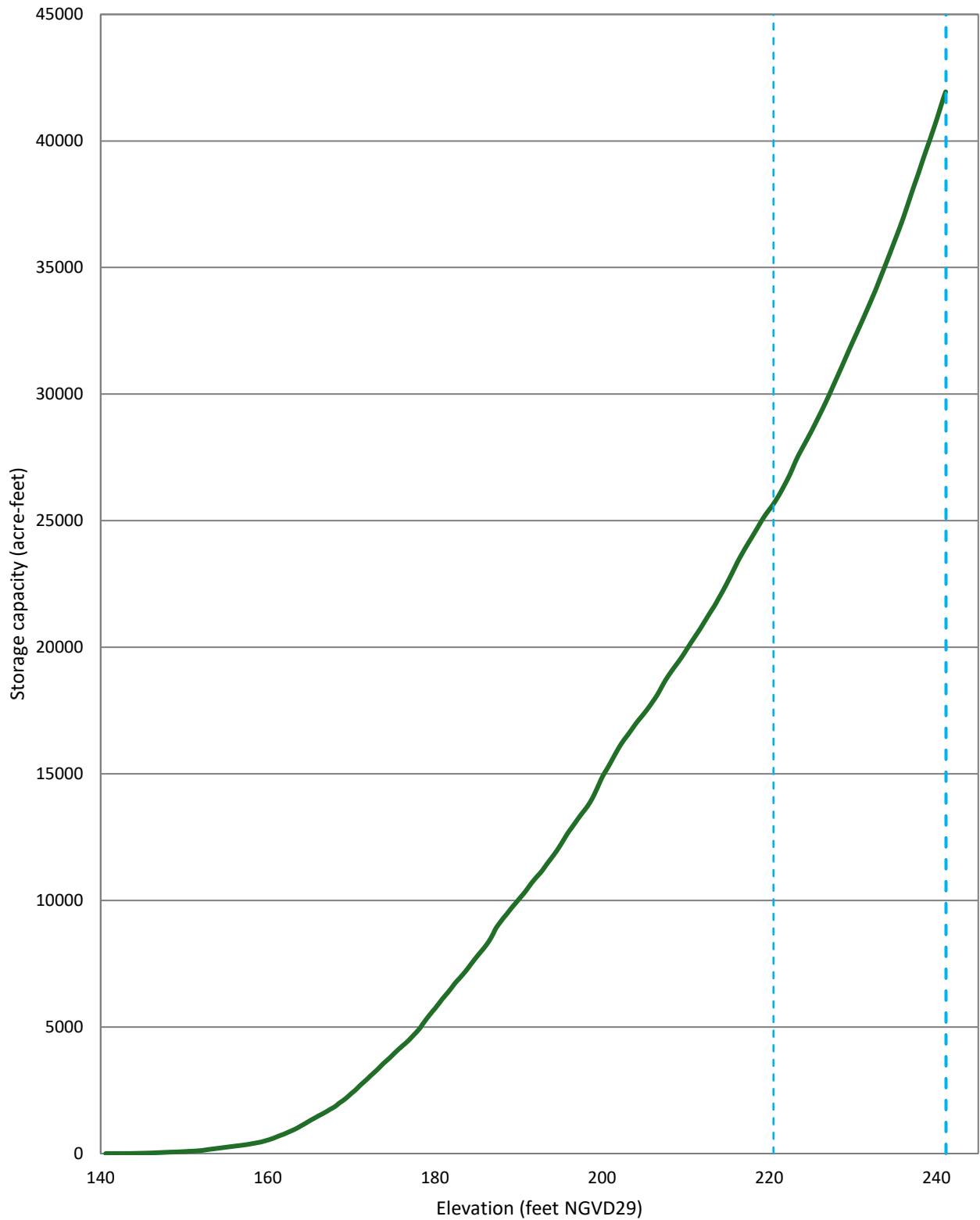
Top of dam elevation 241.14 feet NGVD29

ELEVATION (Feet NGVD29)	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
140	0	0	0	0	0	0	0	0	0	0
141	1	1	1	1	1	1	1	1	2	2
142	2	2	2	2	2	3	3	3	3	3
143	3	3	3	3	3	4	4	4	5	5
144	6	7	8	8	10	10	11	12	12	13
145	14	15	16	16	17	18	19	20	21	22
146	23	24	25	27	29	30	32	33	34	36
147	37	39	40	41	43	44	46	47	49	51
148	52	54	55	56	57	58	59	60	61	62
149	64	65	66	67	69	70	71	73	75	76
150	78	80	82	84	86	87	89	91	93	95
151	96	98	100	102	104	106	108	111	114	116
152	119	123	127	131	136	141	146	151	156	161
153	165	169	173	177	181	186	190	194	198	202
154	207	211	215	219	223	228	232	237	241	246
155	250	254	259	263	267	271	275	279	283	287
156	291	295	299	303	307	311	315	319	323	328
157	332	337	341	346	351	355	360	367	373	379
158	384	391	397	402	408	414	420	426	432	438
159	445	451	459	467	476	486	495	504	514	524
160	533	542	553	563	575	586	598	611	623	637
161	651	664	677	692	704	716	729	740	752	765
162	780	793	808	823	838	852	865	879	894	909
163	924	939	955	970	987	1,005	1,024	1,042	1,062	1,082
164	1,101	1,120	1,137	1,155	1,173	1,192	1,213	1,234	1,253	1,271
165	1,291	1,311	1,330	1,348	1,366	1,384	1,402	1,422	1,440	1,458
166	1,478	1,496	1,513	1,529	1,546	1,562	1,580	1,600	1,618	1,637
167	1,655	1,674	1,695	1,715	1,736	1,755	1,773	1,791	1,809	1,828
168	1,849	1,873	1,897	1,924	1,956	1,981	2,006	2,028	2,050	2,072
169	2,096	2,120	2,145	2,171	2,198	2,225	2,257	2,285	2,316	2,347
170	2,376	2,404	2,430	2,457	2,484	2,515	2,547	2,580	2,612	2,648
171	2,679	2,710	2,741	2,768	2,798	2,827	2,857	2,887	2,916	2,947
172	2,978	3,009	3,045	3,075	3,104	3,133	3,164	3,195	3,225	3,255
173	3,285	3,316	3,348	3,381	3,415	3,450	3,483	3,515	3,550	3,580
174	3,609	3,638	3,668	3,697	3,726	3,755	3,785	3,817	3,850	3,882
175	3,915	3,947	3,981	4,012	4,043	4,074	4,105	4,135	4,164	4,192
176	4,223	4,251	4,280	4,308	4,335	4,365	4,395	4,425	4,456	4,488
177	4,522	4,559	4,594	4,628	4,664	4,697	4,731	4,767	4,802	4,840
178	4,876	4,914	4,953	4,998	5,050	5,100	5,146	5,190	5,235	5,280
179	5,325	5,368	5,411	5,453	5,493	5,533	5,574	5,615	5,654	5,691
180	5,729	5,770	5,812	5,857	5,899	5,941	5,984	6,029	6,072	6,114
181	6,153	6,192	6,232	6,272	6,309	6,346	6,386	6,430	6,471	6,512
182	6,555	6,598	6,644	6,688	6,728	6,768	6,805	6,841	6,877	6,912
183	6,949	6,987	7,024	7,062	7,100	7,139	7,177	7,217	7,258	7,303
184	7,347	7,391	7,435	7,480	7,522	7,564	7,607	7,652	7,693	7,735
185	7,776	7,817	7,858	7,898	7,937	7,975	8,014	8,053	8,093	8,133
186	8,176	8,219	8,265	8,313	8,360	8,411	8,466	8,521	8,581	8,644
187	8,709	8,777	8,845	8,904	8,956	9,003	9,048	9,093	9,137	9,181
188	9,224	9,267	9,310	9,350	9,389	9,428	9,467	9,509	9,552	9,594
189	9,637	9,679	9,719	9,759	9,798	9,836	9,874	9,913	9,952	9,992
190	10,031	10,071	10,110	10,148	10,187	10,225	10,264	10,305	10,348	10,391



— Total capacity 2024
 - - - Conservation pool elevation 220.5 feet
 - - - Top of dam elevation 241.14 feet

















Choke Canyon Reservoir
 August - October 2024 Survey
 Prepared by: TWDB



— Total area 2024
 - - - Conservation pool elevation 220.5 feet
 - - - Top of dam elevation 241.14 feet

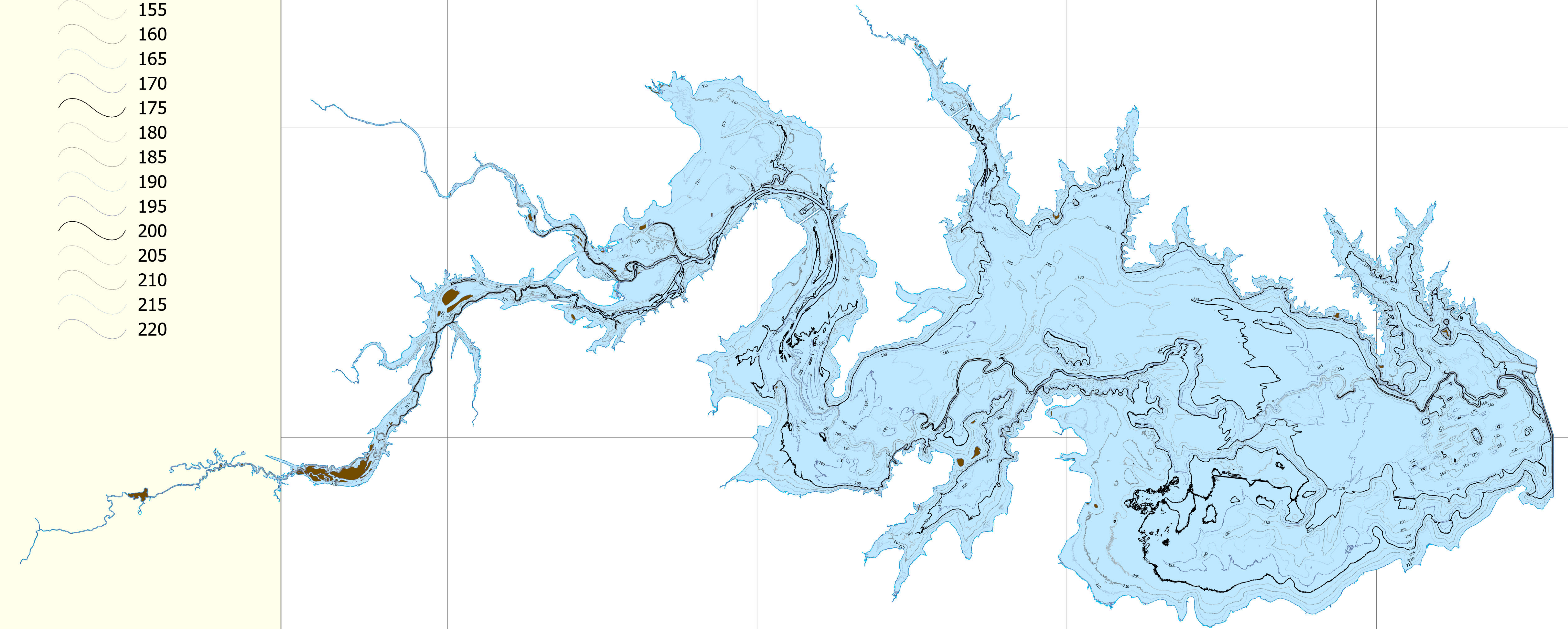
Choke Canyon Reservoir
 August - October 2024 Survey
 Prepared by: TWDB


Figure 6
Contours
feet NGVD29

-  145
-  150
-  155
-  160
-  165
-  170
-  175
-  180
-  185
-  190
-  195
-  200
-  205
-  210
-  215
-  220

Choke Canyon Reservoir

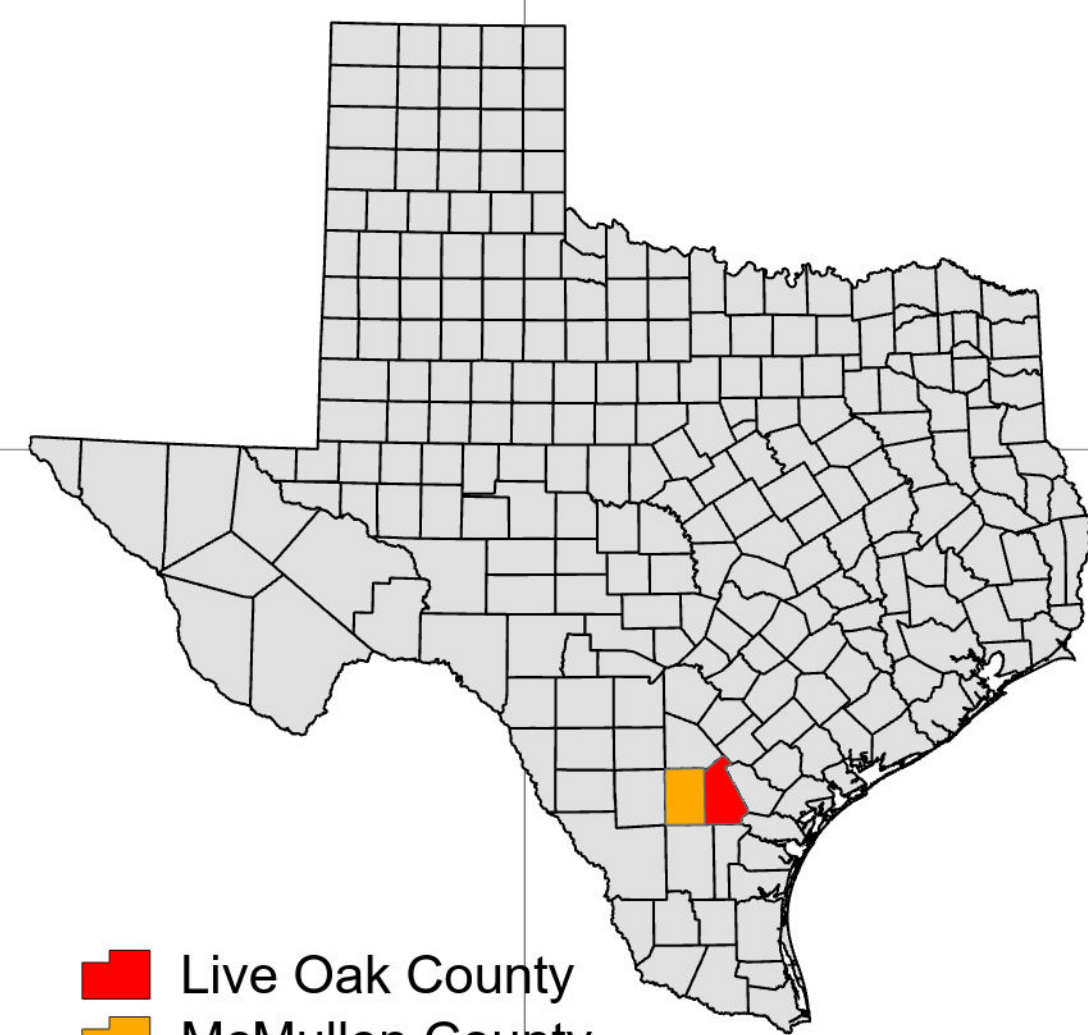
5' - contour map



 Choke Canyon Reservoir:
conservation pool
elevation 220.5 feet

 Islands

Projection: NAD83
State Plane Texas
South Central Zone (feet)



 Live Oak County
 McMullen County



This map is the product of a survey conducted by the Texas Water Development Board's Hydrographic Survey Program to determine the capacity of Choke Canyon Reservoir. The Texas Water Development Board makes no representations nor assumes any liability.



August - October 2024 Survey