



Trophic Classification of Texas Reservoirs

Draft 2024 Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d)

The primary productivity of reservoirs, as indicated by the amount of nutrients (phosphorus and nitrogen) and the extent of algae (suspended, floating, and attached) and rooted aquatic plants, can have a significant effect on water quality. Up to a point, nutrients promote ecosystem production and healthy growth of algae, larger plants, and fish and other aquatic organisms. However, excess nutrients and algae in reservoirs can have a deleterious effect on water quality, and algae can reach nuisance levels that potentially (1) create nuisance aesthetic conditions, (2) cause taste and odor in drinking water sources, (3) contribute to reduced dissolved oxygen as algae decay, and (4) ultimately reduce the ability of a water body to support healthy, diverse aquatic communities.

Eutrophication refers to an overall condition characterized by an accumulation of nutrients that support relatively elevated growth of algae and other organisms. Eutrophication is primarily influenced by the physical and hydrological characteristics of the water body and can be affected by natural processes and human activities in the surrounding watershed. Human activities can accelerate the eutrophication process by increasing the rate at which nutrients and organic substances enter impoundments and surrounding watersheds. Discharges of treated sewage, agricultural and urban runoff, leaking septic tanks, and erosion of stream banks can increase the flow of nutrients and organic substances into reservoirs. In comparison to natural lakes in northern states, the eutrophication process in southern reservoirs is often enhanced by (1) warm climates with long growing seasons, (2) soils and geologic substrates that create high concentrations of sediment and nutrients in rainfall runoff, and (3) relatively high river inflows on main stem impoundments. As a result, some reservoirs in Texas can be relatively eutrophic even where nutrient loadings due to human activities are not relatively large.

The trophic state of a reservoir refers to its nutritional status that is indicated by measurements of nutrients and algae. Section 314 of the U.S. Clean Water Act (CWA) requires all states to classify lakes and reservoirs according to trophic state. Assessing water body condition based on algae is accomplished by evaluating indicators that reflect nutrient dynamics that drive primary production. Various classification schemes (Table 1-1) or indices have been developed that group reservoirs into discrete quality (trophic) states along a continuum from oligotrophic (poorly nourished) to hypereutrophic (over nourished). The basis for the trophic state index concept is that in many reservoirs the degree of eutrophication may be related to increased nutrient

concentrations. Typically, phosphorus is the nutrient of concern and changes in its concentration may trigger a response that influences the amount of algae, as estimated by chlorophyll *a* (Chl *a*) in the reservoir. For example, increases in phosphorus can result in higher algal biomass, which in turn decreases water transparency (as measured by a Secchi disk or submarine photometer).

Table 1 - 1. Types of Trophic States in Reservoirs and Lakes

| Trophic State | Water Quality Characteristics |
|----------------------|--|
| Oligotrophic | Clear waters with extreme clarity, low nutrient concentrations, little organic matter or sediment, and minimal biological activity. |
| Mesotrophic | Waters with moderate nutrient concentrations and, therefore, more biological productivity. Waters may be lightly clouded by organic matter, sediment, suspended solids or algae. |
| Eutrophic | Waters relatively rich in nutrient concentrations, with high biological productivity. Waters more clouded by organic matter, sediment, suspended solids, and algae. |
| Hypereutrophic | Murkier, highly productive waters. Dense algae, very high nutrient concentrations. |

(Adapted from a variety of descriptions of trophic state characteristics)

Major Texas reservoirs have been evaluated and ranked every two years by TCEQ using Carlson's Trophic State Index (TSI). Carlson's Index was developed to compare reservoirs using in-reservoir sampling data (Carlson, 1977; Carlson and Simpson, 1996). Secchi disk depths, chlorophyll *a* concentrations, and total phosphorus concentrations are three variables that are highly correlated and considered estimators of algal biomass. The TSI uses regression analysis to relate these three parameters to determine trophic state and is determined from any of the three computational equations:

$$\text{TSI (Secchi Disk)} = 60 - 14.41 \ln(\text{SD}), \text{ where SD is mean Secchi disk depth in meters.}$$

$$\text{TSI (Chlorophyll } a) = 9.81 \ln(\text{Chl } a) + 30.6, \text{ where Chl } a \text{ is mean chlorophyll } a \text{ in } \mu\text{g/L.}$$

$$\text{TSI (Total Phosphorus)} = 14.42 \ln(\text{TP}) + 4.15, \text{ where TP is mean total phosphorus in } \mu\text{g/L.}$$

Although chlorophyll *a* is the most direct measure of algal biomass, the TSI uses Secchi disk depth as the primary indicator. The index was scaled, so that TSI = 0 represents the largest measured Secchi disk depth (64 m) among reservoirs. Each halving of transparency represents an increase of 10 TSI units (Table 1-2). Since the relationships between Secchi disk and chlorophyll *a* was nonlinear a 10-unit TSI (Chl *a*) change does not correspond to a doubling of chlorophyll *a*. Instead, chlorophyll *a* approximately doubles for each 7-unit increase in TSI (Chl *a*).

Table 1 - 2. Carlson's Trophic State Index and Associated Parameters

| Trophic State Index | Secchi Disc (m) | Total Phosphorus ($\mu\text{g/L}$) | Chlorophyll <i>a</i> ($\mu\text{g/L}$) |
|----------------------------|------------------------|--|--|
| 0 | 64 | 0.75 | 0.04 |
| 10 | 32 | 1.5 | 0.12 |
| 20 | 16 | 3 | 0.34 |
| 30 | 8 | 6 | 0.94 |
| 40 | 4 | 12 | 2.6 |
| 50 | 2 | 24 | 6.4 |
| 60 | 1 | 48 | 20.0 |
| 70 | 0.5 | 96 | 56 |
| 80 | 0.25 | 192 | 154 |
| 90 | 0.12 | 384 | 427 |
| 100 | 0.062 | 768 | 1,183 |

(Adapted from Carlson, 1977; and Carlson and Simpson, 1996)

Carlson's Index provides a useful tool for assessing a reservoir's condition and evaluating changes over time. For example, the index would provide a quantitative estimate of the degree of improvement for a reservoir in which the TSI (Chl *a*) decreased from 60 to 40 units following implementation of restoration measures. The index provides useful information which explains possible causes of the water body condition. For example, if TSI (TP) > TSI (Chl *a*), phosphorus is probably not the limiting nutrient; TSI (SD) > TSI (Chl *a*) indicates the presence of non-algal turbidity.

Carlson's Index represents a simple model for evaluating condition which provides both advantages and disadvantages. The trophic state is developed on a continuous numeric scale and is useful for approximating the oligotrophic-hypereutrophic nomenclature required by EPA. Secchi disk depths, total phosphorus, and chlorophyll *a* concentrations are routinely determined at fixed monitoring stations on reservoirs and lakes, so data is readily available for computation of Carlson's Index. The index does not perform well for certain water quality conditions: (1) where transparency is affected by suspended erosional materials rather than phytoplankton, (2) where primary production is controlled by attached algae or aquatic macrophytes rather than phytoplankton, and (3) when phosphorus is not the nutrient limiting phytoplankton growth.

Although the index can be used to classify and rank Texas reservoirs by trophic state, priority ranking for restoration is difficult. Carlson's Index does not replace the need to make use attainment determinations. Carlson (1977) points out that trophic state is not equivalent to an index of water quality. Assessment of reservoir water quality depends heavily on the assignment of beneficial uses and determinations to evaluate if the uses are being maintained and/or impaired. Texas reservoirs are ranked in Appendix A according to Carlson's TSI for chlorophyll *a* as an average calculated from 10 years of SWQM data (December 1, 2012 - November 30, 2022).

To maximize comparability among reservoirs, data from the monitoring station nearest the dam, with the most available data, in the main pool of each reservoir were utilized if available. In some cases, multiple stations situated within close proximity of one another were also used. For many reservoirs, these are the only sites monitored by TCEQ and the Clean Rivers Program. Chlorophyll *a* was given priority as the primary trophic state indicator because it has proven to be most useful for estimating algal biomass in most reservoirs. A minimum of four chlorophyll *a* measurements, two total phosphorus, and two Secchi disk measurements were required for a reservoir to be included in the ranking. Of the 144 reservoirs surveyed, 141 had sufficient data to be included in the ranking. Based on this assessment, the 141 reservoirs show a range of eutrophication, from oligotrophic to hypereutrophic (Table 1 - 3). Rankings are also provided for total phosphorus (TP) and Secchi disk transparency (SD). Comparing TSI indicators between the reservoirs provides indications of the clearest reservoirs (low TSI SD) and identifies reservoirs with low and high total phosphorus concentrations.

Table 1 - 3. Number of Texas Reservoirs Assessed in Each Trophic Class

| Trophic Class | TSI (Chl <i>a</i>) Index Range | Number of Texas Reservoirs |
|----------------------|---------------------------------------|-----------------------------------|
| Oligotrophic | 0 - 40 | 6 |
| Mesotrophic | >40 - 50 | 21 |
| Eutrophic | >50 - 70 | 109 |
| Hypereutrophic | >70 | 5 |

Adapted from Carlson and Simpson (1996)

Reservoirs with the clearest water (highest mean Secchi disk transparency), listed in descending order are as follows: Canyon Lake (4.64 m), International Amistad Reservoir (4.00 m), Lake Travis (3.92 m), Medina Lake (3.44 m) and Stillhouse Hollow Lake (3.42 m). Reservoirs with the poorest light transparency, (lowest mean Secchi disk transparency), listed in ascending order are as follows: Rita Blanca Lake (0.10 m), Cox Lake (0.12 m), White River Lake (0.22 m), Palo Duro Reservoir (0.24 m), Lake Wichita (0.28 m), and Lake Kirby (0.28).

Thirty-four reservoirs share the lowest mean total phosphorus concentration of 0.02 mg/L. Reservoirs with the highest mean total phosphorus concentrations, listed in descending order are as follows: Rita Blanca Lake (2.82 mg/L), Lake Tanglewood (1.00 mg/L), Lake Woodlands (0.84 mg/L), Palo Duro Reservoir (0.36 mg/L), Lake Corpus Christi (0.32 mg/L), and Lake Wichita (0.30 mg/L).

Water Quality Differences in Reservoirs

Carlson's TSI Chl *a* values for 118 reservoirs from the 2014 and 2024 reporting cycles were compared to indicate temporal differences (Appendix A). Differences could not be calculated for 23 reservoirs (16%), due to the lack of comparable reporting information from 2014. The 2014 period of record was December 1, 2002 - November 30, 2012; for 2024, the period of record was December 1, 2012 - November 30, 2022.

TSI Chl *a* values, which estimate the amount of algal biomass, can indicate water quality improvement when values decrease. There were decreases in TSI Chl *a* values in 43 (36%) of the comparable reservoirs between 2014 and 2024 report cycles. Reservoirs with the largest decrease in mean TSI Chl *a* values, listed in descending order are as follows: O.C. Fisher Lake (-23.32), Lake Wichita (-6.34), Red Bluff Reservoir (-5.50), Canyon Lake (-5.50), and Fairfield Lake (-5.30). Increases in algal biomass (increase in TSI Chl *a* values) are indicated in 74 (63%) of the comparable reservoirs, which may be indicative of natural or cultural eutrophication. Reservoirs with the largest differences for increasing algal content (substantial positive TSI Chl *a* values), listed in descending order are as follows: Lake Crook (+11.34), Lake Amon G. Carter (+8.26), Leon Reservoir (+7.62), Falcon Lake (+6.82), and Lake Brownwood (+6.62).

It should be noted that a reservoir's trophic rank may differ from that in the last assessment due to improvements in data reporting and analytical capabilities or a change in monitoring station(s) rather than changes in water quality. Many individual values in the SWQMIS water quality database are reported as less than analytical reporting limits (non-detects or censored data). There is no generalized way to determine the true value for an individual result in the range between zero and the reporting limit. For the trophic classification assessment of Texas reservoirs, 50 percent of an analytical reporting limit is computed for censored results. This is done to maximize the amount of data used in this analysis and to indicate the level of monitoring effort. For more information, please contact the Surface Water Quality Monitoring Team at swqm@tceq.texas.gov.

Reservoir Control Programs

Texas implements several reservoir pollution control procedures to ensure high-quality water for recreational, aquatic life, domestic, and industrial uses. Surface water quality standards have been adopted for significant reservoirs throughout the state in Title 30, Texas Administrative Code (TAC), Chapter 307 the Texas Surface Water Quality Standards (TSWQS). The TSWQS establish uses for classified segments and unclassified waterbodies. It also includes numerical criteria to protect those uses. Designated uses are determined by considering the reservoir's physical and biological characteristics, natural water quality, and existing uses. Criteria, depending on parameter, are based on background levels or accepted levels for protection of human health and aquatic life. TCEQ issues Texas Pollutant Discharge Elimination System (TPDES) permits that include limits designed to protect these uses. Each major reservoir is routinely monitored to assess the overall condition of the water body in comparison to the criteria and determine short-term or long-term water quality trends. Reservoirs with non-supported uses are placed on the State of Texas 303(d) List. This includes Sub-category 5n, which is established to focus management actions that address nutrients in reservoirs with numeric Chl *a* criteria. When a water body is identified as impaired and in need of remedial efforts, in some cases a Total Maximum Daily Load (TMDL) is conducted to determine the assimilative capacity of the water body for a pollutant under consideration. A TMDL allocates waste loads for permits and load allocations from unregulated sources to ensure attainment with water quality standards. Compliance with wastewater permits is monitored through on-site inspections by TCEQ personnel and through self-reporting procedures. When noncompliance with permits is found, enforcement actions are required to attain compliance. The uses,

criteria, TMDL Implementation Plans, and permits are periodically reviewed and, if necessary, revised.

TCEQ has several specific rules that prescribe permit limitations for discharges of domestic wastewater into reservoirs. The rules in 30 TAC, Chapter 309 Domestic Wastewater Effluent Limitation and Plant Siting, specifically Section (§) 309.3(c), require discharges located within five stream miles upstream of certain reservoirs to achieve a minimum effluent quality. For example, a 5-day biological oxygen demand (BOD₅) of 10 mg/L, and total suspended solids (TSS) of 15 mg/L; both expressed as a 30-day average. This rule applies to reservoirs that are subject to on-site/private sewage facility regulation or that may be used as a source for a public drinking water supply. Currently, 95 reservoirs are designated for the public water supply use in Section (§) 307.10, Appendices A and B of the TSWQS. Additional rules under 30 TAC, Chapter 311 Watershed Protection, have been promulgated that protect specific reservoirs. These rules are listed below.

Subchapter A, B and F: §§311.1-.6, 311.11-.16 and 311.51-.56.

These rules apply to a series of reservoirs on the Colorado River, which are commonly referred to as the Highland Lakes, including Lake Austin (Segment 1403), Lake Travis (Segment 1404), Lake Marble Falls (Segment 1405), Lake LBJ, (Segment 1406), Inks Lake (Segment 1407), and Lake Buchanan (Segment 1408). Water quality areas, those portions of the watersheds within 10 river miles of the reservoirs, were established for each reservoir. New wastewater facilities constructed in these areas will be issued no-discharge permits, meaning that treated wastewater will not be discharged to surface waters. Any existing facility that requires a permit amendment for expansion or is not meeting permit requirements because of sewage overloading will be issued a no-discharge permit. Proposed new or expanded treatment facilities in the watersheds of these reservoirs will be issued no-discharge permits, unless the applicant can establish that any alternative proposed wastewater disposal will protect and maintain the existing quality of the reservoirs. Allowable stormwater runoff and certain non-stormwater discharges that may be authorized by a TPDES or National Pollution Discharge Elimination System (NPDES) permit are also included in these watershed rules.

Subchapter D: §§311.31- .36.

This rule requires all domestic and industrial permittees in the entire Lake Houston (Segment 1002) watershed to meet effluent limitations as specified in the rule. For example, 10 mg/L of carbonaceous BOD₅, 15 mg/L of TSS, and 3 mg/L of ammonia-nitrogen (NH₃-N); all expressed as a 30-day average (domestic discharges). All wastewater effluents disposed of on land shall meet an effluent quality as specified in Sections (§§) 309.1-309.4 and 311.34. Domestic facilities must submit a solids management plan. Additionally, all domestic and industrial facilities with gaseous chlorination disinfection systems must have dual-feed chlorination systems and must meet a minimum chlorine residual of 1 mg/L and a maximum chlorine residual of 4.0 mg/L (instantaneous grab sample).

Subchapter G: §§311.61.-311.67.

This rule applies to Lakes Worth (Segment 0807), Eagle Mountain (Segment 0809), Bridgeport (Segment 0811), Cedar Creek (Segment 0818), Arlington (Segment 0828),

Benbrook (Segment 0830), and Richland-Chambers (Segment 0836). Except for oxidation pond systems, domestic discharges within the water quality areas of the watersheds of these reservoirs are required to meet advanced treatment limits. For example, BOD₅ of 10 mg/L and 15 mg/L TSS (30-day average), and filtration was required to supplement suspended solids removal by January 1, 1993. Section 311.67 specifies effluent limitations to control nutrients from certain new domestic wastewater facilities or discharge permit amendments to increase permitted flow (after January 1, 2015) discharging to the Benbrook Lake watershed and Benbrook Lake water quality area. Based on the discharge point location and size of discharge, permittees must meet a daily effluent limit for TP of 1.0 mg/L, based on a 30-day average.

Reservoir and Lake Restoration Efforts

Section 314 of the Clean Water Act makes federal grant funds available to states for Clean Lakes Program purposes. TCEQ is currently not administering any grant funding under this program. There are several lakes and reservoirs throughout the State where restoration efforts are currently under way to improve water quality. Watershed Protection Plans (WPPs) are voluntary stakeholder-driven plans that may be developed to protect high-quality waters, to address threatened waters before they become impaired, or to restore water impacted by nonpoint source pollutants. TMDLs, which are regulatory in nature, are also developed to restore water bodies. The lakes and reservoirs with ongoing restoration efforts include the following:

Lake O' the Pines – TMDL Implementation Plan

E.V. Spence Reservoir – TMDL Implementation Plan

Lake Austin – TMDL Implementation Plan

Lake Worth – TMDL Implementation Plan

Lake Houston – TMDL Implementation Plan

Aquilla Reservoir – TMDL Implementation Plan

Mountain Creek Lake – TMDL Implementation Plan

Lake Como – TMDL Implementation Plan

Fosdic Lake – TMDL Implementation Plan

Echo Lake – TMDL Implementation Plan

Donna Reservoir – TMDL Implementation Plan

Lake Arlington – Watershed Protection Plan

Lake Granbury – Watershed Protection Plan

Lake Lavon – Watershed Protection Plan

Joe Pool Lake – Watershed Protection Plan

Bois d'Arc Lake/Lake Bonham – Watershed Protection Plan

High and Low pH in Texas Water Bodies

The trophic status of a water body can impact several water quality parameters, including pH. Photosynthesis, respiration, and decomposition all contribute to pH

fluctuations due to their influences on available carbon dioxide levels in the water column. Elevations in pH are typically highest in mid-afternoon, and lowest just before sunrise. Section 314 of the CWA requires states to include methods and procedures to evaluate and mitigate pH as part of the trophic classification.

Instantaneous and diel pH data collected as part of routine water quality monitoring and special studies are evaluated to determine attainment with site-specific water quality standards for high and low pH as part of the Integrated Report. If impaired, TCEQ considers this information when developing restoration strategies such as TMDLs and WPPs to determine if the pH impairment is related to excessive enrichment.

Low pH in Texas Water Bodies

Data from two freshwater streams and one tidal stream (Table 1-4) have indicated low pH (high acidity) in at least one assessment location, resulting in the water bodies being included in the 2024 Index of Water Quality Impairments (Categories 4 and 5). During respiration, dissolved carbon dioxide reacts with water to form carbonic acid, which may lower pH. Most of these water bodies are in the eastern portion of the state, where natural geologic buffering capacity is limited.

Table 1 - 4. Texas Water Bodies with Low pH

| Segment Number | Water Body Name |
|-----------------------|--------------------------------------|
| 0511 | Cow Bayou Tidal |
| 0615 | Angelina River/Sam Rayburn Reservoir |
| 1407A | Clear Creek |

High pH in Texas Water Bodies

Data from 11 reservoirs and two freshwater streams (Table 1-5) have indicated elevated pH (high basicity) in at least one assessment location resulting in the water bodies being included on the 2024 Texas 303(d) List. A likely cause of elevated pH is consumption of dissolved carbon dioxide by photosynthetic processes. Excessive amounts of photosynthetically active algae and macrophytes can increase consumption of carbon dioxide during the day, increasing pH in the water column. Many of these water bodies are in the eastern portion of the state, where natural geologic buffering capacity is limited.

Table 1 - 5. Texas Water Bodies with High pH

| Segment Number | Water Body Name | Trophic Class |
|-----------------------|---------------------------------------|----------------------|
| 0105 | Rita Blanca Lake | Hypereutrophic |
| 0229 | Upper Prairie Dog Town Fork Red River | Unknown |
| 0302 | Wright Patman Lake | Eutrophic |
| 0403 | Lake O' the Pines | Eutrophic |
| 0405 | Lake Cypress Springs | Eutrophic |
| 0512 | Lake Fork Reservoir | Eutrophic |
| 0514 | Big Sandy Creek | Unknown |
| 0605 | Lake Palestine | Eutrophic |
| 0610 | Sam Rayburn Reservoir | Mesotrophic |
| 0818 | Cedar Creek Reservoir | Eutrophic |
| 0826 | Grapevine Lake | Eutrophic |
| 1002 | Lake Houston | Eutrophic |
| 1212 | Somerville Lake | Eutrophic |

Appendix A. Carlson's Trophic State Index (TSI)

Chl *a* – chlorophyll *a*

TP – total phosphorus

The Carlson's TSI (Chl *a*), (TP), and (Secchi) were computed for each reservoir by calculating the arithmetic average for the TSI values from each sample date. The effect of these computations is that the ranking of Carlson's TSI (Chl *a*), (TP), and (Secchi) values may vary slightly from a ranking based on the arithmetic average of chlorophyll *a*, total phosphorus, and Secchi disk values.

| Segment | Station ID | Reservoir | Chl <i>a</i> Rank ¹ | Chl <i>a</i> Records | Chl <i>a</i> Mean (µg/L) | Chl <i>a</i> TSI | Chl <i>a</i> TSI (2012) | 10 Year Change ² | Secchi Rank | Secchi Records | Secchi Mean (m) | Secchi TSI | TP Rank | TP Records | TP Mean (mg/L) ³ | TP TSI |
|---------|--------------|---------------------------------|--------------------------------|----------------------|--------------------------|------------------|-------------------------|-----------------------------|-------------|----------------|-----------------|------------|---------|------------|-----------------------------|--------|
| 1805 | 12597 | CANYON LAKE | 1 | 29 | 1.56 | 34.94 | 40.44 | -5.5 | 1 | 28 | 4.64 | 37.9 | 1 | 28 | 0.02 | 37.4 |
| 1904 | 12825, 12826 | MEDINA LAKE | 2 | 17 | 1.8 | 36.34 | | | 4 | 48 | 3.44 | 42.2 | 2 | 50 | 0.02 | 38 |
| 2305 | 13835 | INTERNATIONAL AMISTAD RESERVOIR | 3 | 24 | 2.16 | 38.12 | 40.4 | -2.28 | 2 | 23 | 4 | 40 | 5 | 22 | 0.02 | 41.3 |
| 1241B | 18414 | LAKE ALAN HENRY | 4 | 19 | 2.16 | 38.16 | 42.64 | -4.48 | 8 | 23 | 3 | 44.22 | 111 | 21 | 0.08 | 67 |
| 1216 | 11894 | STILLHOUSE HOLLOW LAKE | 5 | 38 | 2.4 | 39.16 | 42.1 | -2.94 | 5 | 40 | 3.42 | 42.26 | 29 | 38 | 0.02 | 50.6 |
| 0302G | 20813 | TP LAKE | 6 | 8 | 2.52 | 39.68 | 38.4 | 1.28 | 39 | 15 | 1.32 | 56.02 | 57 | 10 | 0.04 | 55.8 |
| 1404 | 12302 | LAKE TRAVIS | 7 | 71 | 2.64 | 40.14 | 42.28 | -2.14 | 3 | 71 | 3.92 | 40.3 | 4 | 71 | 0.02 | 41.1 |
| 0506M | 21823 | TYLER STATE PARK LAKE | 8 | 23 | 2.98 | 41.3 | | | 6 | 26 | 3.34 | 42.64 | 6 | 25 | 0.02 | 41.4 |
| 0404N | 17337 | LAKE DAINGERFIELD | 9 | 20 | 3.28 | 42.24 | | | 9 | 24 | 2.72 | 45.62 | 39 | 22 | 0.04 | 53.6 |
| 1249 | 12111 | LAKE GEORGETOWN | 10 | 38 | 3.62 | 43.24 | 47.46 | -4.22 | 16 | 38 | 1.84 | 51.18 | 29 | 38 | 0.02 | 50.6 |
| 0611R | 17824 | LAKE STRIKER | 12 | 37 | 3.68 | 43.38 | 43.3 | 0.08 | 86 | 39 | 0.8 | 63.06 | 84 | 37 | 0.04 | 60.3 |
| 0614 | 10639 | LAKE JACKSONVILLE | 12 | 28 | 3.68 | 43.38 | 44.78 | -1.4 | 11 | 39 | 2.6 | 46.22 | 7 | 31 | 0.02 | 42.1 |

¹ Reservoirs are ranked in priority by TSI (Chl *a*). A true rank was used which can result in a tied rank for reservoirs with the same TSI (Chl *a*). Therefore, some ranking assignments are skipped by the computational data model. The rank resumes with subsequent rank value.

² A positive value indicates increased algal content. A negative value indicates decreased algal content. Missing values indicate a comparison cannot be made due to absence of comparable data.

³ Total phosphorus concentrations converted from µg/L to mg/L.

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| Segment | Station ID | Reservoir | Chl <i>a</i> Rank ¹ | Chl <i>a</i> Records | Chl <i>a</i> Mean (µg/L) | Chl <i>a</i> TSI | Chl <i>a</i> TSI (2012) | 10 Year Change ² | Secchi Rank | Secchi Records | Secchi Mean (m) | Secchi TSI | TP Rank | TP Records | TP Mean (mg/L) ³ | TP TSI |
|---------|---------------------------|-------------------------|--------------------------------|----------------------|--------------------------|------------------|-------------------------|-----------------------------|-------------|----------------|-----------------|------------|---------|------------|-----------------------------|--------|
| 1234 | 12005 | LAKE CISCO | 13 | 23 | 3.88 | 43.92 | 43.18 | 0.74 | 76 | 25 | 0.88 | 61.88 | 46 | 24 | 0.04 | 54.8 |
| 0506I | 14422 | LAKE HAWKINS | 14 | 36 | 5.08 | 46.54 | 47.8 | -1.26 | 10 | 36 | 2.62 | 46.16 | 8 | 31 | 0.02 | 42.4 |
| 1604 | 15377 | LAKE TEXANA | 15 | 38 | 5.24 | 46.84 | 41.54 | 5.3 | 138 | 115 | 0.3 | 77.48 | 132 | 38 | 0.18 | 79 |
| 1220 | 11921 | BELTON LAKE | 16 | 38 | 5.32 | 46.98 | 47.38 | -0.4 | 15 | 39 | 2.04 | 49.76 | 25 | 38 | 0.02 | 50 |
| 0611Q | 15801 | LAKE NACOGDOCHES | 17 | 39 | 5.62 | 47.56 | 47.26 | 0.3 | 26 | 40 | 1.64 | 52.88 | 31 | 39 | 0.02 | 50.9 |
| 0505E | 13703 | BRANDY BRANCH RESERVOIR | 18 | 36 | 5.9 | 48.02 | 42.42 | 5.6 | 7 | 40 | 3.06 | 43.86 | 13 | 35 | 0.02 | 45.1 |
| 1403 | 12294 | LAKE AUSTIN | 19 | 67 | 6.3 | 48.66 | 44.08 | 4.58 | 18 | 69 | 1.84 | 51.26 | 12 | 67 | 0.02 | 45 |
| 0204B | 15447 | MOSS LAKE | 20 | 33 | 6.44 | 48.86 | 48 | 0.86 | 40 | 34 | 1.28 | 56.34 | 93 | 31 | 0.06 | 62 |
| 0213 | 10143 | LAKE KICKAPOO | 21 | 34 | 6.52 | 48.98 | 48.24 | 0.74 | 131 | 35 | 0.38 | 74.16 | 96 | 32 | 0.06 | 62.6 |
| 1233 | 12002 | HUBBARD CREEK RESERVOIR | 22 | 22 | 6.54 | 49.02 | 46.6 | 2.42 | 56 | 26 | 1.02 | 59.86 | 29 | 23 | 0.02 | 50.6 |
| 0610 | 14906 | SAM RAYBURN RESERVOIR | 23 | 34 | 6.64 | 49.18 | 48.58 | 0.6 | 22 | 38 | 1.72 | 52.12 | 76 | 33 | 0.04 | 59 |
| 0203 | 20545 | LAKE TEXOMA | 24 | 82 | 6.82 | 49.42 | | | 36 | 82 | 1.42 | 54.9 | 76 | 81 | 0.04 | 59 |
| 0228 | 10188 | MACKENZIE RESERVOIR | 25 | 22 | 6.9 | 49.54 | 50.5 | -0.96 | 44 | 23 | 1.16 | 57.96 | 14 | 21 | 0.02 | 45.9 |
| 1426A | 12180 | OAK CREEK RESERVOIR | 26 | 27 | 6.98 | 49.66 | 51.8 | -2.14 | 30 | 24 | 1.52 | 54.04 | 15 | 24 | 0.02 | 46.8 |
| 0811 | 10970 | LAKE BRIDGEPORT | 27 | 43 | 7.04 | 49.74 | 47.36 | 2.38 | 53 | 43 | 1.04 | 59.42 | 27 | 44 | 0.02 | 50.3 |
| 0504 | 10404 | TOLEDO BEND RESERVOIR | 29 | 108 | 7.26 | 50.04 | 47.96 | 2.08 | 19 | 109 | 1.78 | 51.62 | 58 | 104 | 0.04 | 55.9 |
| 1433 | 12511 | O. H. IVIE RESERVOIR | 29 | 18 | 7.26 | 50.04 | 48.52 | 1.52 | 17 | 19 | 1.84 | 51.2 | 17 | 19 | 0.02 | 48.1 |
| 0202Q | 16945 | PICKENS LAKE | 31 | 30 | 7.44 | 50.3 | | | 27 | 33 | 1.62 | 53.08 | 74 | 30 | 0.04 | 58.8 |
| 1419 | 12398 | LAKE COLEMAN | 31 | 19 | 7.44 | 50.3 | 49.54 | 0.76 | 62 | 21 | 0.96 | 60.64 | 26 | 20 | 0.02 | 50.1 |
| 0840 | 14039, 17834, 22314 | RAY ROBERTS LAKE | 32 | 44 | 7.78 | 50.74 | | | 46 | 51 | 1.12 | 58.36 | 18 | 54 | 0.02 | 48.3 |
| 1418C | 12178 | HORDS CREEK RESERVOIR | 33 | 12 | 7.96 | 50.94 | 50.98 | -0.04 | 54 | 14 | 1.02 | 59.84 | 20 | 14 | 0.02 | 48.8 |
| 1207 | 11865 | POSSUM KINGDOM LAKE | 34 | 114 | 8.62 | 51.72 | 54.52 | -2.8 | 12 | 116 | 2.58 | 46.32 | 51 | 114 | 0.04 | 55.3 |
| 0605F | 17575 | LAKE ATHENS | 35 | 33 | 8.7 | 51.82 | 50.9 | 0.92 | 14 | 39 | 2.06 | 49.54 | 9 | 30 | 0.02 | 43.5 |
| 1408 | 12344 | LAKE BUCHANAN | 36 | 71 | 9.02 | 52.16 | 53.42 | -1.26 | 21 | 71 | 1.72 | 52.1 | 21 | 71 | 0.02 | 49.3 |
| 1230 | 11977 | LAKE PALO PINTO | 37 | 16 | 9.42 | 52.6 | 49.68 | 2.92 | 91 | 14 | 0.78 | 63.74 | 55 | 16 | 0.04 | 55.7 |

TCEQ AS-229 • Trophic Classification of Texas Reservoirs

| Segment | Station ID | Reservoir | Chl <i>a</i> Rank ¹ | Chl <i>a</i> Records | Chl <i>a</i> Mean (µg/L) | Chl <i>a</i> TSI | Chl <i>a</i> TSI (2012) | 10 Year Change ² | Secchi Rank | Secchi Records | Secchi Mean (m) | Secchi TSI | TP Rank | TP Records | TP Mean (mg/L) ³ | TP TSI |
|---------|---------------------|-------------------------------------|--------------------------------|----------------------|--------------------------|------------------|-------------------------|-----------------------------|-------------|----------------|-----------------|------------|---------|------------|-----------------------------|--------|
| 0612G | 21435 | NACONICHE LAKE | 38 | 34 | 9.62 | 52.8 | | | 32 | 37 | 1.48 | 54.32 | 19 | 36 | 0.02 | 48.7 |
| 0217 | 10159 | LAKE KEMP | 39 | 35 | 9.86 | 53.04 | 54.06 | -1.02 | 42 | 36 | 1.16 | 57.94 | 34 | 33 | 0.02 | 52.6 |
| 0603 | 10582 | B A. STEINHAGEN LAKE | 40 | 36 | 10.6 | 53.76 | 54.02 | -0.26 | 133 | 37 | 0.36 | 74.64 | 98 | 33 | 0.06 | 63.3 |
| 0604T | 17339 | LAKE RATCLIFF | 41 | 39 | 10.74 | 53.9 | 58.68 | -4.78 | 91 | 39 | 0.78 | 63.74 | 90 | 37 | 0.06 | 61.6 |
| 1429 | 12476 | LADY BIRD LAKE (FORMERLY TOWN LAKE) | 42 | 56 | 10.86 | 54 | 51.28 | 2.72 | 20 | 55 | 1.76 | 51.9 | 82 | 50 | 0.04 | 60 |
| 0510 | 15514 | LAKE CHEROKEE | 43 | 33 | 11.22 | 54.32 | 51.68 | 2.64 | 61 | 66 | 0.96 | 60.58 | 36 | 2 | 0.04 | 53.2 |
| 0212 | 10142 | LAKE ARROWHEAD | 44 | 35 | 11.46 | 54.54 | 54.52 | 0.02 | 116 | 35 | 0.5 | 69.84 | 130 | 32 | 0.16 | 77.4 |
| 0836 | 15168 | RICHLAND-CHAMBERS RESERVOIR | 45 | 41 | 11.58 | 54.62 | 56.06 | -1.44 | 51 | 42 | 1.06 | 59.3 | 62 | 41 | 0.04 | 56.3 |
| 0838 | 11073 | JOE POOL LAKE | 46 | 9 | 11.78 | 54.8 | | | 109 | 9 | 0.58 | 67.94 | 10 | 9 | 0.02 | 44.2 |
| 1418 | 12395 | LAKE BROWNWOOD | 47 | 16 | 11.86 | 54.86 | 48.24 | 6.62 | 57 | 20 | 1 | 59.94 | 37 | 17 | 0.04 | 53.5 |
| 0408 | 10329, 17059 | LAKE BOB SANDLIN | 48 | 35 | 12.04 | 55 | 50.52 | 4.48 | 24 | 37 | 1.7 | 52.42 | 11 | 34 | 0.02 | 44.4 |
| 0223 | 10173 | GREENBELT RESERVOIR | 49 | 23 | 12.46 | 55.34 | 48.94 | 6.4 | 95 | 24 | 0.74 | 64.42 | 61 | 24 | 0.04 | 56.1 |
| 1423 | 12422 | TWIN BUTTES RESERVOIR | 50 | 23 | 12.62 | 55.48 | 60.14 | -4.66 | 67 | 25 | 0.94 | 60.88 | 41 | 25 | 0.04 | 53.9 |
| 1203 | 11851, 13987 | LAKE WHITNEY | 51 | 31 | 12.88 | 55.66 | | | 23 | 40 | 1.72 | 52.24 | 23 | 31 | 0.02 | 49.8 |
| 1231 | 11979 | LAKE GRAHAM | 52 | 21 | 12.92 | 55.7 | 49.98 | 5.72 | 99 | 22 | 0.7 | 65.14 | 72 | 20 | 0.04 | 57.9 |
| 0214H | 20162 | NORTH FORK BUFFALO CREEK RESERVOIR | 53 | 20 | 12.98 | 55.74 | | | 120 | 20 | 0.46 | 70.9 | 124 | 18 | 0.1 | 70.7 |
| 1406 | 12324 | LAKE LYNDON B. JOHNSON | 54 | 69 | 13.16 | 55.88 | 54.16 | 1.72 | 33 | 70 | 1.48 | 54.36 | 24 | 70 | 0.02 | 49.9 |
| 0613 | 10637, 10638 | LAKE TYLER EAST | 55 | 64 | 13.2 | 55.92 | 54.24 | 1.68 | 31 | 74 | 1.48 | 54.26 | 16 | 66 | 0.02 | 47 |
| 0506L | 18847 | LAKE HOLBROOK | 56 | 15 | 13.24 | 55.94 | 55.36 | 0.58 | 28 | 16 | 1.58 | 53.46 | 23 | 14 | 0.02 | 49.8 |
| 1434I | 21959 | BUESCHER STATE PARK LAKE | 57 | 7 | 13.46 | 56.1 | | | 52 | 10 | 1.04 | 59.36 | 71 | 8 | 0.04 | 57.8 |
| 0823 | 11025, 11027, 17830 | LEWISVILLE LAKE | 59 | 23 | 14.06 | 56.52 | 56.76 | -0.24 | 101 | 19 | 0.68 | 65.52 | 35 | 35 | 0.02 | 52.9 |
| 1407 | 12336 | INKS LAKE | 59 | 70 | 14.04 | 56.52 | 57.76 | -1.24 | 35 | 69 | 1.42 | 54.86 | 63 | 70 | 0.04 | 56.7 |
| 2454A | 12514 | COX LAKE | 60 | 28 | 14.22 | 56.64 | 55.6 | 1.04 | 143 | 30 | 0.12 | 90.76 | 133 | 25 | 0.2 | 80.7 |

TCEQ AS-229 • Trophic Classification of Texas Reservoirs

| Segment | Station ID | Reservoir | Chl <i>a</i> Rank ¹ | Chl <i>a</i> Records | Chl <i>a</i> Mean (µg/L) | Chl <i>a</i> TSI | Chl <i>a</i> TSI (2012) | 10 Year Change ² | Secchi Rank | Secchi Records | Secchi Mean (m) | Secchi TSI | TP Rank | TP Records | TP Mean (mg/L) ³ | TP TSI |
|---------|---------------------|--|--------------------------------|----------------------|--------------------------|------------------|-------------------------|-----------------------------|-------------|----------------|-----------------|------------|---------|------------|-----------------------------|--------|
| 1247 | 12095 | GRANGER LAKE | 61 | 38 | 14.34 | 56.72 | 55.78 | 0.94 | 121 | 38 | 0.44 | 71.78 | 46 | 38 | 0.04 | 54.8 |
| 0834 | 11063 | LAKE AMON G. CARTER | 62 | 22 | 14.52 | 56.84 | 48.58 | 8.26 | 49 | 22 | 1.08 | 58.96 | 33 | 19 | 0.02 | 52.4 |
| 2103 | 12967 | LAKE CORPUS CHRISTI | 63 | 40 | 14.64 | 56.92 | 58.44 | -1.52 | 135 | 41 | 0.34 | 75.82 | 139 | 40 | 0.32 | 87.7 |
| 1413 | 21614 | LAKE J. B. THOMAS | 64 | 16 | 14.98 | 57.16 | | | 71 | 17 | 0.9 | 61.36 | 65 | 17 | 0.04 | 57.1 |
| 0512 | 10458 | LAKE FORK RESERVOIR | 66 | 108 | 15.14 | 57.26 | 54.92 | 2.34 | 47 | 112 | 1.12 | 58.46 | 82 | 104 | 0.04 | 60 |
| 0818 | 16748, 16749 | CEDAR CREEK RESERVOIR | 66 | 89 | 15.16 | 57.26 | | | 63 | 86 | 0.94 | 60.74 | 53 | 88 | 0.04 | 55.6 |
| 0303A | 16856 | BIG CREEK LAKE | 67 | 27 | 15.38 | 57.42 | 57.98 | -0.56 | 122 | 28 | 0.44 | 71.92 | 122 | 25 | 0.1 | 69.4 |
| 1405 | 12319 | LAKE MARBLE FALLS | 68 | 68 | 15.44 | 57.46 | 53.36 | 4.1 | 29 | 68 | 1.54 | 53.82 | 85 | 68 | 0.04 | 60.5 |
| 0809 | 10944 | EAGLE MOUNTAIN RESERVOIR | 69 | 43 | 15.62 | 57.56 | 61.46 | -3.9 | 79 | 45 | 0.86 | 62.22 | 87 | 44 | 0.06 | 61 |
| 0830 | 15151 | BENBROOK LAKE | 70 | 46 | 15.7 | 57.62 | 61.78 | -4.16 | 89 | 47 | 0.78 | 63.56 | 57 | 45 | 0.04 | 55.8 |
| 1411 | 13863 | E. V. SPENCE RESERVOIR | 71 | 19 | 16.02 | 57.82 | 62.28 | -4.46 | 41 | 18 | 1.24 | 57.02 | 78 | 19 | 0.04 | 59.5 |
| 0816 | 10980 | LAKE WAXAHACHIE | 72 | 37 | 16.06 | 57.84 | 58.3 | -0.46 | 113 | 39 | 0.54 | 68.98 | 52 | 40 | 0.04 | 55.4 |
| 2312 | 13267 | RED BLUFF RESERVOIR | 73 | 16 | 16.44 | 58.06 | 63.56 | -5.5 | 84 | 14 | 0.82 | 62.84 | 32 | 15 | 0.02 | 51 |
| 0806G | 22142 | MARINE CREEK LAKE | 74 | 12 | 16.46 | 58.08 | | | 64 | 12 | 0.94 | 60.78 | 43 | 12 | 0.04 | 54.4 |
| 0215 | 10157 | DIVERSION LAKE | 75 | 28 | 16.82 | 58.28 | 55.08 | 3.2 | 112 | 29 | 0.54 | 68.66 | 55 | 26 | 0.04 | 55.7 |
| 0506H | 17062 | LAKE GLADEWATER | 76 | 36 | 17.34 | 58.58 | 60.12 | -1.54 | 73 | 40 | 0.9 | 61.46 | 69 | 35 | 0.04 | 57.6 |
| 0307 | 13855 | JIM L. CHAPMAN LAKE (FORMERLY COOPER LAKE) | 77 | 35 | 17.38 | 58.62 | 58.32 | 0.3 | 106 | 38 | 0.64 | 66.56 | 110 | 33 | 0.08 | 66.9 |
| 1012 | 11342 | LAKE CONROE | 79 | 37 | 17.5 | 58.68 | 57.12 | 1.56 | 70 | 113 | 0.92 | 61.18 | 104 | 112 | 0.06 | 64.4 |
| 1422 | 12418 | LAKE NASWORTHY | 79 | 25 | 17.52 | 58.68 | 55.16 | 3.52 | 81 | 24 | 0.84 | 62.5 | 71 | 26 | 0.04 | 57.8 |
| 0818J | 17949 | PURTIS CREEK STATE PARK LAKE | 80 | 19 | 17.62 | 58.74 | | | 58 | 24 | 1 | 60.06 | 106 | 21 | 0.06 | 64.9 |
| 0208 | 10137 | LAKE CROOK | 81 | 36 | 17.64 | 58.76 | 47.42 | 11.34 | 136 | 38 | 0.32 | 76.62 | 126 | 36 | 0.14 | 74.5 |
| 0505F | 13601 | MARTIN CREEK RESERVOIR | 82 | 37 | 17.76 | 58.82 | 58.4 | 0.42 | 44 | 40 | 1.16 | 57.96 | 42 | 35 | 0.04 | 54 |
| 0826 | 11035, 17827, 22316 | GRAPEVINE LAKE | 83 | 45 | 17.78 | 58.84 | | | 85 | 51 | 0.82 | 62.9 | 51 | 54 | 0.04 | 55.3 |
| 0102 | 10036 | LAKE MEREDITH | 84 | 26 | 17.92 | 58.92 | 54.66 | 4.26 | 70 | 28 | 0.92 | 61.18 | 40 | 25 | 0.04 | 53.8 |

TCEQ AS-229 ● Trophic Classification of Texas Reservoirs

| Segment | Station ID | Reservoir | Chl <i>a</i> Rank ¹ | Chl <i>a</i> Records | Chl <i>a</i> Mean (µg/L) | Chl <i>a</i> TSI | Chl <i>a</i> TSI (2012) | 10 Year Change ² | Secchi Rank | Secchi Records | Secchi Mean (m) | Secchi TSI | TP Rank | TP Records | TP Mean (mg/L) ³ | TP TSI |
|---------|-----------------|--|--------------------------------|----------------------|--------------------------|------------------|-------------------------|-----------------------------|-------------|----------------|-----------------|------------|---------|------------|-----------------------------|--------|
| 0209 | 16343 | PAT MAYSE RESERVOIR | 85 | 37 | 18.12 | 59.02 | 58.68 | 0.34 | 50 | 39 | 1.08 | 59 | 39 | 36 | 0.04 | 53.6 |
| 0210 | 10139 | FARMERS CREEK RESERVOIR (ALSO KNOWN AS LAKE NOCONA) | 86 | 36 | 18.18 | 59.04 | 53.88 | 5.16 | 89 | 37 | 0.78 | 63.56 | 68 | 34 | 0.04 | 57.5 |
| 0214G | 17947 | LAKE IOWA PARK | 87 | 20 | 18.24 | 59.08 | | | 131 | 20 | 0.38 | 74.16 | 112 | 18 | 0.08 | 67.3 |
| 1254 | 12127 | AQUILLA RESERVOIR | 88 | 33 | 18.58 | 59.26 | 55.2 | 4.06 | 111 | 35 | 0.56 | 68.12 | 66 | 29 | 0.04 | 57.4 |
| 1434C | 17020 | LAKE BASTROP | 89 | 59 | 18.94 | 59.46 | 62.2 | -2.74 | 37 | 59 | 1.42 | 55 | 114 | 58 | 0.08 | 67.4 |
| 0817 | 10981 | NAVARRO MILLS LAKE | 90 | 33 | 19.04 | 59.5 | 55.28 | 4.22 | 114 | 35 | 0.52 | 69.28 | 100 | 34 | 0.06 | 63.5 |
| 0401 | 10283 | CADDO LAKE | 92 | 38 | 19.22 | 59.6 | 57.76 | 1.84 | 96 | 117 | 0.72 | 64.66 | 102 | 37 | 0.06 | 63.9 |
| 0813 | 10973 | HOUSTON COUNTY LAKE | 92 | 34 | 19.22 | 59.6 | 54.94 | 4.66 | 45 | 37 | 1.12 | 58.3 | 44 | 34 | 0.04 | 54.6 |
| 1225 | 11942 | WACO LAKE | 93 | 33 | 19.26 | 59.62 | 57.44 | 2.18 | 87 | 35 | 0.8 | 63.08 | 68 | 31 | 0.04 | 57.5 |
| 2116 | 13019, 13020 | CHOKO CANYON RESERVOIR | 94 | 58 | 19.46 | 59.72 | 56.42 | 3.3 | 118 | 59 | 0.5 | 70.12 | 123 | 59 | 0.1 | 70.3 |
| 1232D | 17941 | LAKE DANIEL | 95 | 27 | 19.86 | 59.92 | | | 129 | 31 | 0.38 | 74.02 | 115 | 28 | 0.08 | 67.6 |
| 0409D | 17478 | LAKE GILMER | 97 | 35 | 20.1 | 60.04 | 58.14 | 1.9 | 34 | 39 | 1.46 | 54.54 | 59 | 33 | 0.04 | 56 |
| 0815 | 10979 | BARDWELL RESERVOIR | 97 | 36 | 20.12 | 60.04 | 59.48 | 0.56 | 127 | 38 | 0.38 | 73.82 | 88 | 39 | 0.06 | 61.1 |
| 1242H | 18457 | TRADINGHOUSE CREEK RESERVOIR | 98 | 35 | 20.34 | 60.16 | 60.16 | 0 | 77 | 34 | 0.88 | 62 | 80 | 34 | 0.04 | 59.8 |
| 1237 | 12021 | LAKE SWEETWATER | 99 | 25 | 20.5 | 60.24 | | | 78 | 28 | 0.86 | 62.18 | 79 | 26 | 0.04 | 59.7 |
| 1236 | 12010 | FORT PHANTOM HILL LAKE | 100 | 28 | 20.64 | 60.3 | 58.1 | 2.2 | 98 | 29 | 0.7 | 64.96 | 97 | 27 | 0.06 | 63.1 |
| 1425 | 12429 | O. C. FISHER RESERVOIR | 101 | 20 | 20.96 | 60.44 | 83.76 | -23.32 | 102 | 18 | 0.68 | 65.6 | 107 | 20 | 0.08 | 65.4 |
| 0828 | 13904 | LAKE ARLINGTON | 102 | 45 | 21.14 | 60.54 | 65.46 | -4.92 | 97 | 45 | 0.72 | 64.7 | 86 | 45 | 0.06 | 60.7 |
| 0807 | 10942 | LAKE WORTH | 103 | 44 | 21.24 | 60.58 | 63.96 | -3.38 | 105 | 44 | 0.64 | 66.32 | 83 | 45 | 0.04 | 60.1 |
| 0803 | 10899 | LAKE LIVINGSTON | 104 | 35 | 21.78 | 60.82 | 59.9 | 0.92 | 125 | 36 | 0.4 | 73.48 | 120 | 35 | 0.08 | 68.9 |
| 0820 | 10998, 21365 | LAKE RAY HUBBARD | 105 | 44 | 21.96 | 60.9 | | | 73 | 52 | 0.9 | 61.46 | 49 | 57 | 0.04 | 55.2 |
| 1205 | 11860 | LAKE GRANBURY | 106 | 113 | 22.68 | 61.22 | 62.86 | -1.64 | 74 | 113 | 0.9 | 61.64 | 61 | 112 | 0.04 | 56.1 |
| 1224 | 11939 | LEON RESERVOIR | 107 | 23 | 22.8 | 61.28 | 53.66 | 7.62 | 56 | 23 | 1.02 | 59.86 | 64 | 21 | 0.04 | 56.8 |
| 0701D | 10642 | SHALLOW PRONG LAKE | 108 | 32 | 23.22 | 61.46 | 58.8 | 2.66 | 117 | 38 | 0.5 | 69.88 | 117 | 34 | 0.08 | 68.3 |

TCEQ AS-229 • Trophic Classification of Texas Reservoirs

| Segment | Station ID | Reservoir | Chl <i>a</i> Rank ¹ | Chl <i>a</i> Records | Chl <i>a</i> Mean (µg/L) | Chl <i>a</i> TSI | Chl <i>a</i> TSI (2012) | 10 Year Change ² | Secchi Rank | Secchi Records | Secchi Mean (m) | Secchi TSI | TP Rank | TP Records | TP Mean (mg/L) ³ | TP TSI |
|---------|--------------|--------------------------------|--------------------------------|----------------------|--------------------------|------------------|-------------------------|-----------------------------|-------------|----------------|-----------------|------------|---------|------------|-----------------------------|--------|
| 0821 | 15685 | LAVON LAKE | 110 | 80 | 24.44 | 61.96 | | | 104 | 84 | 0.64 | 66.24 | 99 | 84 | 0.06 | 63.4 |
| 1428K | 20161 | WALTER E. LONG LAKE | 110 | 23 | 24.48 | 61.96 | 60.18 | 1.78 | 38 | 23 | 1.38 | 55.38 | 73 | 19 | 0.04 | 58 |
| 2303 | 13189 | INTERNATIONAL FALCON RESERVOIR | 111 | 29 | 26.04 | 62.58 | 55.76 | 6.82 | 59 | 33 | 0.98 | 60.26 | 102 | 28 | 0.06 | 63.9 |
| 1252 | 12123 | LAKE LIMESTONE | 112 | 85 | 26.16 | 62.62 | 62.52 | 0.1 | 94 | 89 | 0.74 | 64.28 | 94 | 86 | 0.06 | 62.5 |
| 0405 | 10312 | LAKE CYPRESS SPRINGS | 113 | 39 | 26.18 | 62.64 | 58.22 | 4.42 | 48 | 45 | 1.1 | 58.6 | 48 | 40 | 0.04 | 55 |
| 1228 | 11974 | LAKE PAT CLEBURNE | 114 | 37 | 27.6 | 63.14 | 59.54 | 3.6 | 100 | 40 | 0.68 | 65.44 | 77 | 38 | 0.04 | 59.3 |
| 1008F | 16482 | LAKE WOODLANDS | 115 | 40 | 28.74 | 63.54 | 61.84 | 1.7 | 119 | 117 | 0.48 | 70.64 | 141 | 40 | 0.84 | 101.1 |
| 1240 | 12027 | WHITE RIVER LAKE | 116 | 34 | 29.78 | 63.9 | 57.66 | 6.24 | 142 | 41 | 0.22 | 81.26 | 105 | 36 | 0.06 | 64.8 |
| 0605 | 16159 | LAKE PALESTINE | 117 | 36 | 29.84 | 63.92 | 63.9 | 0.02 | 60 | 40 | 0.98 | 60.4 | 129 | 33 | 0.16 | 77.1 |
| 0507 | 10434 | LAKE TAWAKONI | 118 | 104 | 30.02 | 63.96 | 65.66 | -1.7 | 82 | 108 | 0.82 | 62.74 | 91 | 101 | 0.06 | 61.8 |
| 0403 | 10296 | LAKE O' THE PINES | 119 | 36 | 30.78 | 64.22 | 59.58 | 4.64 | 75 | 40 | 0.88 | 61.72 | 48 | 37 | 0.04 | 55 |
| 1416B | 12179 | BRADY CREEK RESERVOIR | 120 | 26 | 32.6 | 64.78 | 60.16 | 4.62 | 80 | 26 | 0.84 | 62.36 | 96 | 26 | 0.06 | 62.6 |
| 1235 | 12006 | LAKE STAMFORD | 121 | 21 | 33.18 | 64.96 | 58.98 | 5.98 | 123 | 23 | 0.42 | 72.18 | 108 | 21 | 0.08 | 65.9 |
| 1002 | 11204 | LAKE HOUSTON | 122 | 29 | 33.44 | 65.04 | 61.54 | 3.5 | 124 | 31 | 0.42 | 72.72 | 137 | 30 | 0.24 | 82.7 |
| 0302 | 10213, 14097 | WRIGHT PATMAN LAKE | 123 | 75 | 34.36 | 65.3 | 67.74 | -2.44 | 107 | 159 | 0.64 | 66.6 | 109 | 71 | 0.08 | 66.2 |
| 0827 | 11038 | WHITE ROCK LAKE | 124 | 35 | 34.7 | 65.4 | 65.22 | 0.18 | 111 | 38 | 0.56 | 68.12 | 114 | 36 | 0.08 | 67.4 |
| 0832 | 11061 | LAKE WEATHERFORD | 125 | 39 | 35.56 | 65.64 | 61.02 | 4.62 | 108 | 39 | 0.6 | 67.18 | 89 | 37 | 0.06 | 61.2 |
| 1210 | 17586 | LAKE MEXIA | 126 | 36 | 35.78 | 65.7 | 65.48 | 0.22 | 134 | 41 | 0.36 | 74.88 | 131 | 36 | 0.16 | 77.7 |
| 1222 | 11935 | PROCTOR LAKE | 127 | 18 | 36.46 | 65.88 | 65.62 | 0.26 | 115 | 20 | 0.52 | 69.6 | 127 | 18 | 0.14 | 74.7 |
| 0804J | 17951 | FAIRFIELD LAKE | 128 | 31 | 36.68 | 65.94 | 71.24 | -5.3 | 65 | 35 | 0.94 | 60.82 | 119 | 32 | 0.08 | 68.7 |
| 0199A | 10005 | PALO DURO RESERVOIR | 129 | 16 | 37.84 | 66.24 | 62.46 | 3.78 | 141 | 17 | 0.24 | 80.78 | 140 | 15 | 0.36 | 88.7 |
| 0509 | 10444 | MURVAUL LAKE | 130 | 35 | 37.94 | 66.26 | 67.2 | -0.94 | 93 | 39 | 0.74 | 64.24 | 93 | 34 | 0.06 | 62 |
| 0515A | 17948 | LAKE QUITMAN | 131 | 38 | 41.4 | 67.12 | | | 92 | 38 | 0.76 | 63.84 | 103 | 30 | 0.06 | 64.3 |
| 1212 | 11881 | SOMERVILLE LAKE | 132 | 31 | 42.68 | 67.42 | 68.14 | -0.72 | 103 | 32 | 0.68 | 65.78 | 125 | 28 | 0.1 | 71.1 |
| 0202M | 16943, 21032 | LAKE BONHAM (BONHAM CITY LAKE) | 133 | 99 | 44.56 | 67.84 | 70.2 | -2.36 | 132 | 94 | 0.36 | 74.6 | 119 | 98 | 0.08 | 68.7 |

| Segment | Station ID | Reservoir | Chl <i>a</i> Rank ¹ | Chl <i>a</i> Records | Chl <i>a</i> Mean (µg/L) | Chl <i>a</i> TSI | Chl <i>a</i> TSI (2012) | 10 Year Change ² | Secchi Rank | Secchi Records | Secchi Mean (m) | Secchi TSI | TP Rank | TP Records | TP Mean (mg/L) ³ | TP TSI |
|---------|------------|-------------------------------------|--------------------------------|----------------------|--------------------------|------------------|-------------------------|-----------------------------|-------------|----------------|-----------------|------------|---------|------------|-----------------------------|--------|
| 1402G | 17017 | CEDAR CREEK RESERVOIR/ LAKE FAYETTE | 134 | 59 | 47.62 | 68.5 | 62.7 | 5.8 | 68 | 57 | 0.92 | 61.08 | 128 | 58 | 0.14 | 75.6 |
| 1241C | 11529 | BUFFALO SPRINGS LAKE | 135 | 20 | 50.5 | 69.08 | 68.52 | 0.56 | 83 | 23 | 0.82 | 62.82 | 116 | 22 | 0.08 | 67.8 |
| 1242A | 16781 | NEW MARLIN CITY LAKE | 136 | 35 | 52.36 | 69.42 | 71.1 | -1.68 | 128 | 35 | 0.38 | 73.92 | 135 | 31 | 0.22 | 81.4 |
| 0229A | 10192 | LAKE TANGLEWOOD | 137 | 25 | 67.84 | 71.96 | 70.54 | 1.42 | 67 | 27 | 0.94 | 60.88 | 142 | 21 | 1 | 103.6 |
| 0219 | 10163 | LAKE WICHITA | 138 | 33 | 69.16 | 72.16 | 78.5 | -6.34 | 139 | 32 | 0.28 | 78.24 | 138 | 32 | 0.3 | 86.8 |
| 1253A | 16247 | SPRINGFIELD LAKE | 139 | 36 | 79.44 | 73.52 | 69.7 | 3.82 | 137 | 37 | 0.3 | 77 | 136 | 36 | 0.22 | 82.2 |
| 1236B | 11521 | KIRBY LAKE | 140 | 22 | 115.3 | 77.18 | | | 140 | 24 | 0.28 | 78.8 | 135 | 22 | 0.22 | 81.4 |
| 0105 | 10060 | RITA BLANCA LAKE | 141 | 19 | 727.04 | 95.24 | 96.34 | -1.1 | 144 | 21 | 0.1 | 92.18 | 143 | 20 | 2.82 | 118.7 |

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