# 2017 & 2021 Bankhead Reservoir Report

*Rivers and Reservoirs Monitoring Program*

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Alabama Department of Environmental Management

Field Operations Division
Rivers and Reservoirs Unit
August 2025

# Rivers and Reservoirs Monitoring Program

# 2021

# Bankhead Reservoir

Black Warrior River Basin

**Alabama Department of Environmental Management**
**Field Operations Division**
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**August 2025**

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# LIST OF ACRONYMS

| | |
|---|---|
| A&I | Agricultural and Industrial Water Supply |
| ADEM | Alabama Department of Environmental Management |
| AGPT | Algal Growth Potential Test |
| BW | Black Warrior |
| CHL *a* | Chlorophyll *a* |
| DO | Dissolved Oxygen |
| F&W | Fish and Wildlife |
| MAX | Maximum |
| MDL | Method Detection Limit |
| MIN | Minimum |
| MSC | Mean Standing Crop |
| NTU | Nephelometric Turbidity Units |
| OAW | Outstanding Alabama Waters |
| ONRW | Outstanding National Resource Water |
| PWS | Public Water Supply |
| QAPP | Quality Assurance Project Plan |
| RRMP | Rivers and Reservoirs Monitoring Program |
| S | Swimming and Other Whole Body Water-Contact Sports |
| SD | Standard Deviation |
| SOP | Standard Operating Procedures |
| TEMP | Temperature |
| TN | Total Nitrogen |
| TMDL | Total Maximum Daily Load |
| TP | Total Phosphorus |
| TSI | Trophic State Index |
| TSS | Total Suspended Solids |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |

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## INTRODUCTION

Bankhead Reservoir's 9,200 acre waterbody was established in 1915 by the US Army Corps of Engineers (COE) with the completion of John Hollis Bankhead Dam and is the second largest reservoir in the Black Warrior system. While the COE maintains dam operations, Alabama Power owns and operates the generating plant. This allows Bankhead to fulfill multiple purposes, like fishing, recreation, and power supply.

The Valley Creek embayment of Bankhead Reservoir was placed on Alabama's 2016 CWA §303(d) list of impaired waters for not meeting its Public Water Supply/Swimming/Fish & Wildlife (PWS/S/F&W) water use classification for nutrient enrichment caused by municipal sources. The Valley Creek embayment was also included on the 2024 CWA §303(d) list for not meeting its water use classification for pathogen impairment (*E. coli*) caused by agriculture, collection system failure, and municipal sources. In 2022, the Alabama Department of Public Health (ADPH) issued a fish consumption advisory based on data collected in 2021 due to mercury found in fish tissue. As a result, the Lost Creek embayment of Bankhead Reservoir was placed on the 2024 CWA §303(d) list for not meeting its Swimming/Fish & Wildlife (S/F&W) water use classification for mercury caused by atmospheric deposition.

The Alabama Department of Environmental Management (ADEM) monitored Bankhead Reservoir as part of the 2017 and 2021 assessments of the Black Warrior (BW) River Basin under the Rivers and Reservoirs Monitoring Program (RRMP). ADEM began monitoring lake water quality statewide in 1985, followed by a second statewide survey in 1989. In 1990, the Reservoir Water Quality Monitoring Program (now known as RRMP) was initiated by the Field Operations Division of the ADEM. The current objectives of this program are to provide data that can be used to assess current water quality conditions, to identify trends in water quality conditions, and to develop Total Maximum Daily Loads (TMDLs) and water quality criteria. Descriptions of all RRMP monitoring activities are available in ADEM's 2017 Monitoring Strategy (ADEM 2017).

A specific water quality criterion for nutrient management ~~was~~was implemented in 2004 at one location on Bankhead Reservoir. This criterion represents a ~~the~~ maximum growing season (April-October) mean chlorophyll *a* (chl *a*) concentration ~~allowable while still fully supporting the reservoir's~~that is protective of Bankhead Reservoir's Public Water Supply, Swimming, and Fish

and Wildlife (PWS/S/F&W) use classifications. This criteria limit is denoted in Table 1.

The purpose of this report is to summarize data collected at eight stations in Bankhead Reservoir during the 2017 and 2021 growing seasons and to evaluate trends in mean lake trophic status and nutrient concentrations using ADEM's historic dataset. Monthly and/or mean concentrations of nutrients [total nitrogen (TN); total phosphorus (TP)], algal biomass/productivity [chl *a*; algal growth potential testing (AGPT)], sediment [total suspended solids (TSS)], and trophic state [Carlson's trophic state index (TSI)] were compared to ADEM's historical data and established criteria.

## METHODS

Sampling stations were selected using historical data and previous assessments (Figure 1). Specific location information can be found in Table 1. Bankhead Reservoir was sampled in the dam forebay, mid reservoir and in both the Mulberry and Locust Forks of the upper reservoir. Monitoring stations were also established in the Lost Creek, Village Creek, Valley Creek, and Big Yellow Creek embayments.

Water quality sampling was conducted at monthly intervals, April-October. All samples were collected, preserved, stored, and transported according to procedures in the ADEM Field Operations Division Standard Operating Procedures (ADEM 2021), Surface Water Quality Assurance Project Plan (ADEM 2023), and Quality Management Plan (ADEM 2018).

Growing season mean TN, TP, chl *a*, and TSS were calculated to evaluate water quality conditions at each site. For mainstem stations, monthly concentrations of these parameters were graphed with the closest available APCO or USGS flow data and ADEM's previously collected data to help interpret the 2017 and 2021 results (lower and mid stations: APCO flow data; Locust Fork: USGS 02456500 Locust Fork at Sayre, AL; Mulberry Fork: USGS 02453500 Mulberry Fork near Cordova, AL).

Figure 1. Bankhead Reservoir with sampling locations. A description of each sampling location is provided in Table 1.

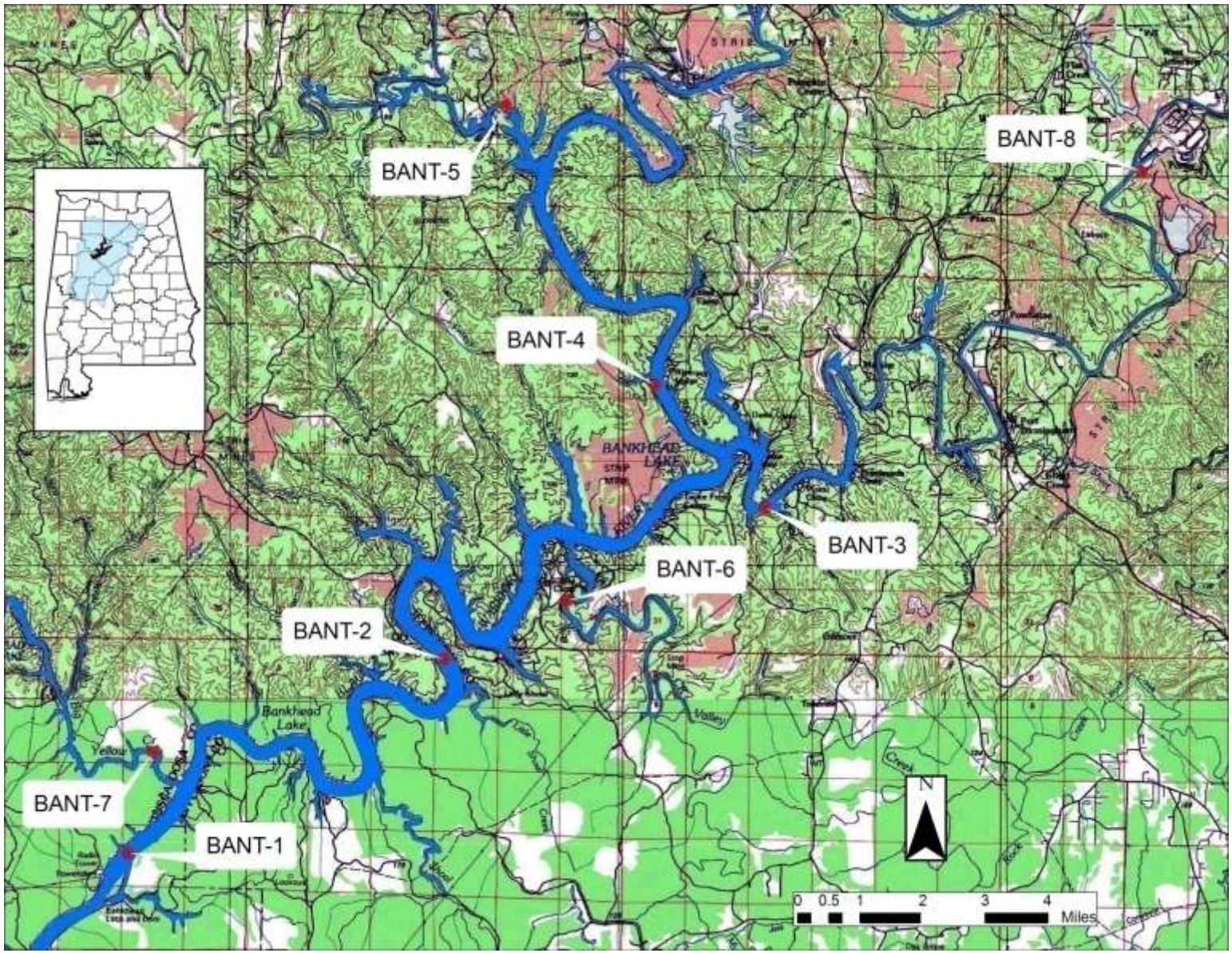


Table 1. Descriptions for the monitoring stations in 2017 and 2021 for Bankhead Reservoir.

| HUC | County | Station Number | Report Designation | Waterbody Name | Station Description | Chl *a* Criteria | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|
| **Bankhead Reservoir** | | | | | | | | |
| 031601120203 | Tuscaloosa | BANT-1* | Lower | Black Warrior R | Deepest point, main river channel, dam forebay. | 16 µg/l | 33.4642 | -87.3511 |
| 031601120203 | Jefferson | BANT-2 | Mid | Black Warrior R | Deepest point, main river channel, mid-reservoir. Approx. 0.5 mi. upstream of Little Shoal Creek confluence. | | 33.5095 | -87.2637 |
| 031601110413 | Jefferson | BANT-3 | Locust Fk | Black Warrior R | Deepest point, main river channel, Locust Fork. Approx. 1.5 mi. upstream of Mulberry, Locust confluence. | | 33.5448 | -87.1750 |
| 031601090604 | Walker | BANT-4 | Mulberry Fk | Black Warrior R | Deepest point, main river channel, Mulberry Fork. Approx. 1.5 mi. upstream of Mulberry, Locust confluence. | | 33.5732 | -87.2055 |
| 031601090604 | Walker | BANT-5 | Lost Ck | Lost Ck | Deepest point, main creek channel, Lost Creek embayment. Approx. 0.5 mi. downstream of Walker Co. Rd. 53 bridge. | | 33.6380 | -87.2470 |
| 031601120106 | Jefferson | BANT-6 | Valley Ck | Valley Ck | Deepest point, main creek channel, Valley Creek embayment. Approx. 1 mile upstream of confluence with Warrior River. | | 33.5231 | -87.2299 |
| 031601120202 | Tuscaloosa | BANT-7 | Big Yellow Ck | Big Yellow Ck | Deepest point, main creek channel, Big Yellow Creek embayment. Approx. 1 mile upstream of confluence with Warrior River. | | 33.4876 | -87.3443 |
| 031601110409 | Jefferson | BANT-8 | Village Ck | Village Ck | Deepest point, main creek channel, Village Creek embayment. Approx. 0.5 mile upstream of confluence with Black Warrior River. | | 33.6228 | -87.0706 |

*Growing season mean chl *a* criteria implemented at this station in 2004.

## RESULTS

Growing season mean graphs for TN, TP, chl *a*, and TSS are provided in this section (Figures 2 and 3). Monthly graphs for TN, TP, chl *a*, TSS, DO, and TSI are also provided (Figures 4-9 and 14-15). Mean monthly discharge is included in monthly graphs for TN, TP, chl *a*, TSS, and TSI as an indicator of flow and retention time in the months sampled. Algal growth potential test (AGPT) results appear in Table 2. Depth profile graphs of temperature, DO, and conductivity appear in (Figures 10-13) Summary statistics of all data collected during 2017 and 2021 are presented in Appendix Table 1 and Appendix Table 2, respectively. The tables contain the minimum, maximum, median, mean, and standard deviation of each parameter analyzed.

Stations with the highest concentrations of nutrients, chl *a*, and TSS are noted in the paragraphs to follow. Though stations with lowest concentrations may not always be mentioned, review of the included graphs will indicate these stations that may be potential candidates for reference waterbodies and watersheds.

The highest mean growing season TN value among all stations was calculated for the Village Creek embayment station in both 2017 and 2021 (Figure 2). While mean TN concentrations at all stations have varied over the years, Village Creek, Locust Fork, and Valley Creek have consistently had growing season means > 1.0 mg/L. Monthly TN graphs are displayed in Figure 4.

In 2017 and 2021, the highest mean growing season embayment TP value was calculated for the Valley Creek station (Figure 2). The highest mean growing season TP value among mainstem stations was calculated for the Locust Fork station in both 2017 and 2021. In general, mean TP concentrations at all stations, except Valley Creek and the mid station, decreased 2007-2017. However, mean growing season TP values increased slightly from 2017 to 2021 at every station except Village Creek. Monthly TP graphs are displayed in Figure 5.

The growing season mean chl *a* concentration at the lower Bankhead station was below established criterion in both 2017 and 2021. The highest growing season mean chl *a* concentrations were calculated for Locust Fork in 2017 and Big Yellow Creek in 2021 (Figure 3). Mean annual chl *a* values varied over the years at all stations, but 2021 values were considerably lower than

those observed in 2017 at almost all stations sampled. Monthly chl *a* graphs are displayed in Figure 6.

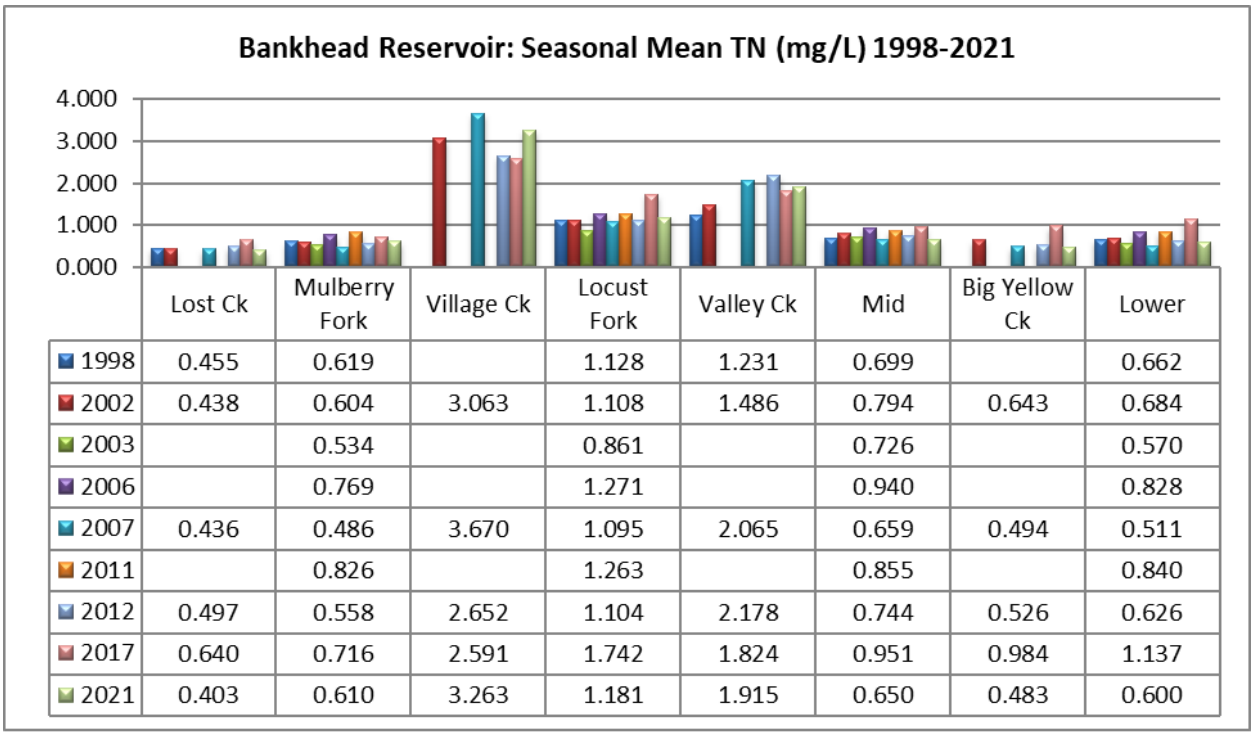
The highest mean growing season TSS values were calculated for the Village Creek and Valley Creek stations in 2017 (Figure 3). The highest mean growing season TSS value in 2021 was calculated for the Locust Fork station. Mean annual TSS concentrations decreased from 2002 to 2012 at all stations, except Village Creek. However, concentrations at those same stations increased from 2012 to 2021, with the values observed in 2021 being the highest calculated since the start of sampling at Lost Creek, Locust Fork, and the mid station. Monthly TSS graphs are displayed in Figure 7.

In 2017, AGPT samples were collected at the Mulberry Fork, Locust Fork, and mid reservoir stations (Table 2). The Mulberry Fork station has historically been phosphorus-limited all years monitored, but in 2017, it was non-limiting. The Locust Fork and mid stations were phosphorus-limited in 2017. The maximum standing crop (MSC) values measured these stations were all above 5.0 mg/L, the value that Raschke and Schultz (1987) defined as protective of reservoir and lake systems. However, Mulberry Fork was below 20 mg/L MSC, the value that Raschke and Schultz (1987) defined as protective of flowing stream and river systems. No AGPT samples were collected at Bankhead Reservoir in 2021.

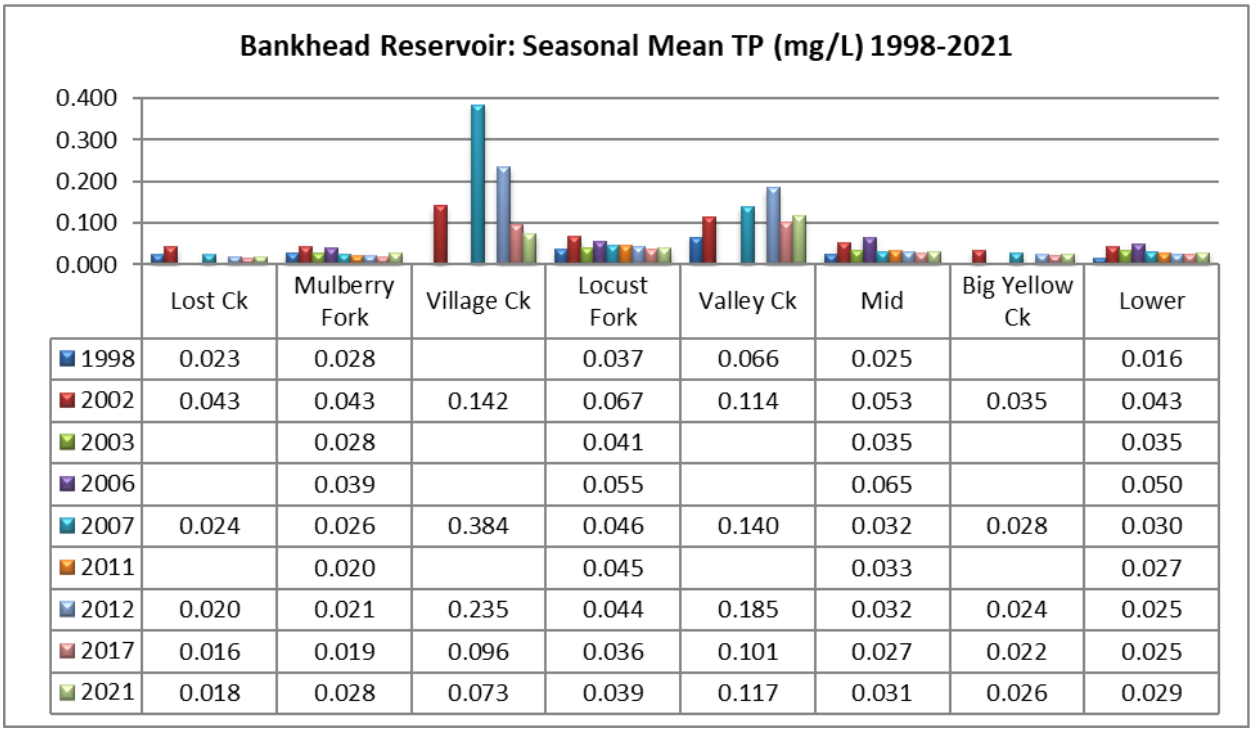
All mainstem and embayment stations on Bankhead Reservoir were above ADEM's DO criteria limit of 5.0 mg/L at 5.0 ft (1.5 m) in all months sampled during both the 2017 and 2021 growing seasons (ADEM Admin. Code R. 335-6-10-.09) (Figures 8 and 9). Based on monthly DO profiles, the mid and lower stations were stratified the majority of the growing season in 2017 (Figures 10 and 11). In June, August, and September conditions were essentially deoxygenated in over half the water column at the lower station. Anoxic conditions also existed at the mid station during June and October at depths greater than 10.0 meters. Water temperatures at both stations were generally highest June-August in 2017. DO profiles from 2021 suggest the water column was more well-mixed than in 2017 (Figures 12 and 13). Highest water temperatures in 2021 were observed in August and September at both the lower and mid stations.

TSI values were calculated using monthly chl *a* concentrations and Carlson's Trophic State Index. With exception of the Mulberry Fork station in July and the lower station in June, July, and October, which were mesotrophic, the mainstem stations of Bankhead Reservoir were eutrophic the majority of the growing season during 2017 (Figure 14). While the Lost Creek and Big Yellow Creek tributary stations were eutrophic the entire growing season, Village Creek and Valley Creek fluctuated between eutrophic and mesotrophic conditions, with Village Creek even becoming oligotrophic in July. In 2021, all the mainstem stations had TSI values that ranged from mesotrophic to eutrophic, except for May at the mid station, which was oligotrophic (Figure 15). The Big Yellow Creek embayment station remained eutrophic all months in 2021. Lost Creek and Valley Creek ranged from eutrophic to oligotrophic throughout the growing season, and Village Creek fluctuated between mesotrophic and oligotrophic conditions.

Figure 2. Mean growing season TN and TP measured in Bankhead Reservoir, April-October 1998-2021. Bar graphs consist of mainstem and embayment stations, illustrated from upstream to downstream as the graph is read from left to right.

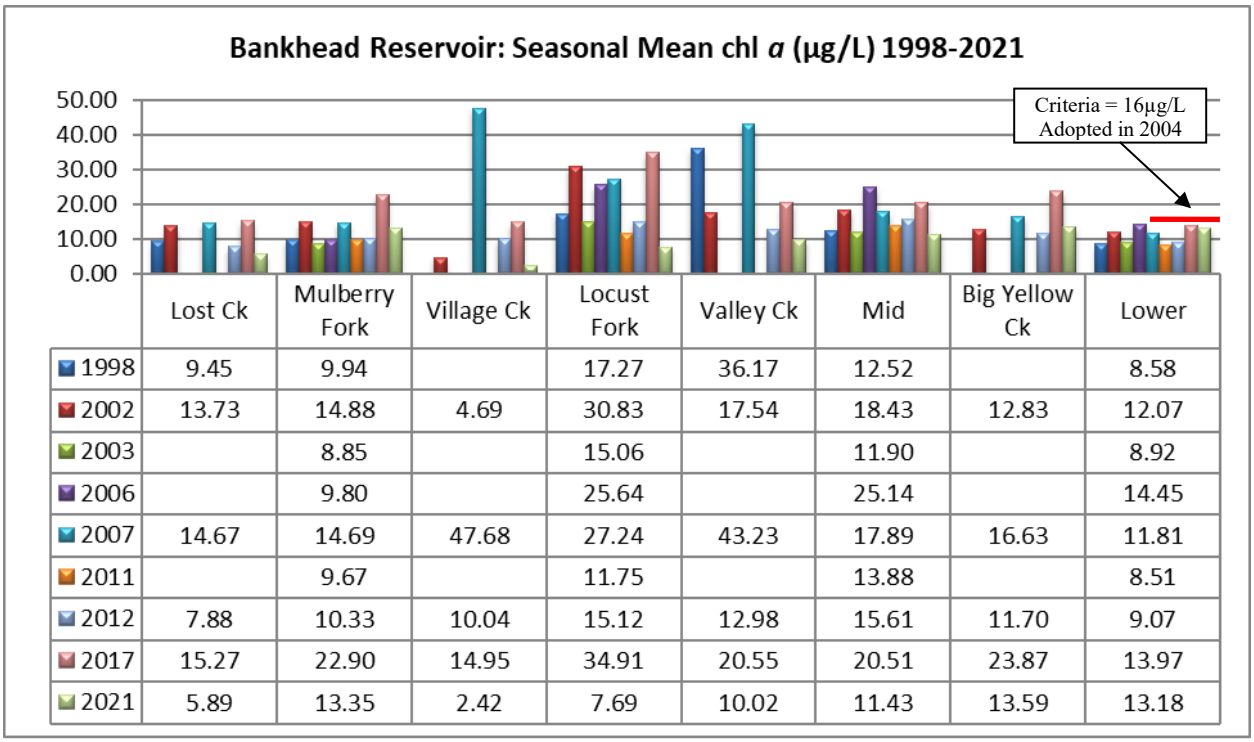



| | Lost Ck | Mulberry Fork | Village Ck | Locust Fork | Valley Ck | Mid | Big Yellow Ck | Lower |
|---|---|---|---|---|---|---|---|---|
| 1998 | 0.455 | 0.619 | | 1.128 | 1.231 | 0.699 | | 0.662 |
| 2002 | 0.438 | 0.604 | 3.063 | 1.108 | 1.486 | 0.794 | 0.643 | 0.684 |
| 2003 | | 0.534 | | 0.861 | | 0.726 | | 0.570 |
| 2006 | | 0.769 | | 1.271 | | 0.940 | | 0.828 |
| 2007 | 0.436 | 0.486 | 3.670 | 1.095 | 2.065 | 0.659 | 0.494 | 0.511 |
| 2011 | | 0.826 | | 1.263 | | 0.855 | | 0.840 |
| 2012 | 0.497 | 0.558 | 2.652 | 1.104 | 2.178 | 0.744 | 0.526 | 0.626 |
| 2017 | 0.640 | 0.716 | 2.591 | 1.742 | 1.824 | 0.951 | 0.984 | 1.137 |
| 2021 | 0.403 | 0.610 | 3.263 | 1.181 | 1.915 | 0.650 | 0.483 | 0.600 |

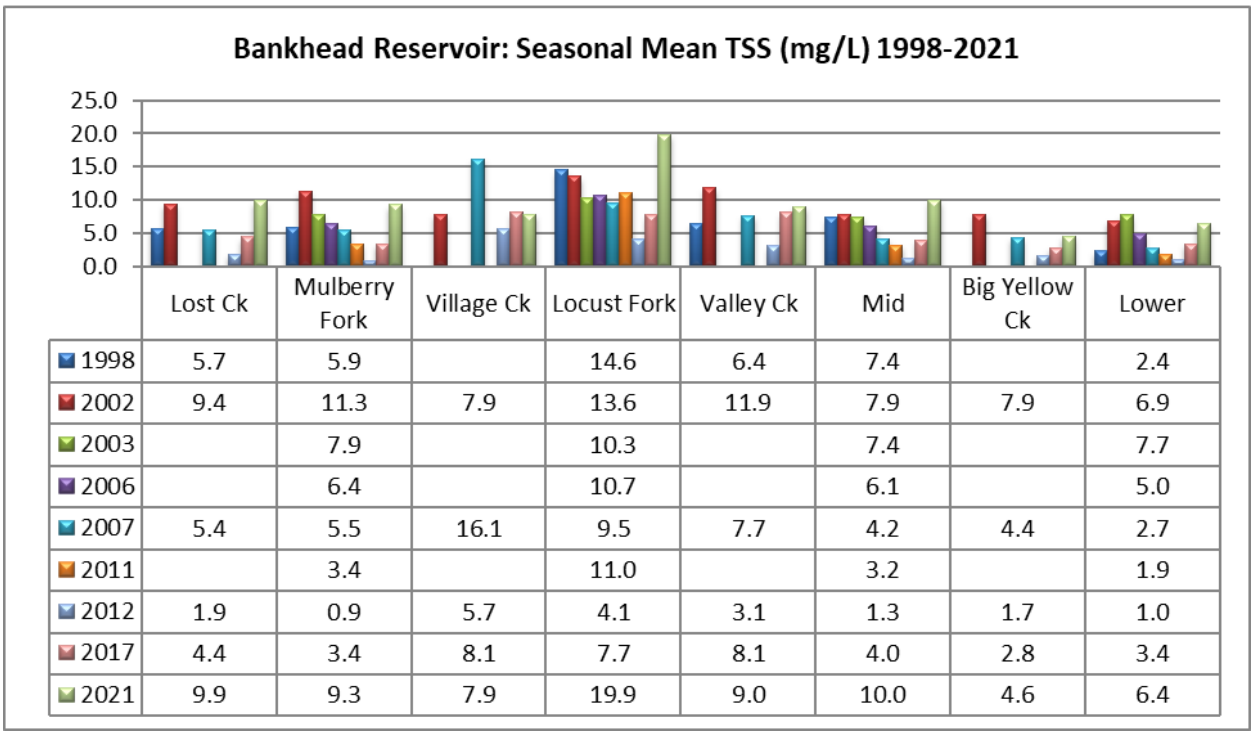



| | Lost Ck | Mulberry Fork | Village Ck | Locust Fork | Valley Ck | Mid | Big Yellow Ck | Lower |
|---|---|---|---|---|---|---|---|---|
| 1998 | 0.023 | 0.028 | | 0.037 | 0.066 | 0.025 | | 0.016 |
| 2002 | 0.043 | 0.043 | 0.142 | 0.067 | 0.114 | 0.053 | 0.035 | 0.043 |
| 2003 | | 0.028 | | 0.041 | | 0.035 | | 0.035 |
| 2006 | | 0.039 | | 0.055 | | 0.065 | | 0.050 |
| 2007 | 0.024 | 0.026 | 0.384 | 0.046 | 0.140 | 0.032 | 0.028 | 0.030 |
| 2011 | | 0.020 | | 0.045 | | 0.033 | | 0.027 |
| 2012 | 0.020 | 0.021 | 0.235 | 0.044 | 0.185 | 0.032 | 0.024 | 0.025 |
| 2017 | 0.016 | 0.019 | 0.096 | 0.036 | 0.101 | 0.027 | 0.022 | 0.025 |
| 2021 | 0.018 | 0.028 | 0.073 | 0.039 | 0.117 | 0.031 | 0.026 | 0.029 |

Figure 3. Mean growing season chl *a* and TSS measured in Bankhead Reservoir, April-October 1998-2021. Bar graphs consist of mainstem and embayment stations, illustrated from upstream to downstream as the graph is read from left to right.




| | Lost Ck | Mulberry Fork | Village Ck | Locust Fork | Valley Ck | Mid | Big Yellow Ck | Lower |
|---|---|---|---|---|---|---|---|---|
| 1998 | 9.45 | 9.94 | | 17.27 | 36.17 | 12.52 | | 8.58 |
| 2002 | 13.73 | 14.88 | 4.69 | 30.83 | 17.54 | 18.43 | 12.83 | 12.07 |
| 2003 | | 8.85 | | 15.06 | | 11.90 | | 8.92 |
| 2006 | | 9.80 | | 25.64 | | 25.14 | | 14.45 |
| 2007 | 14.67 | 14.69 | 47.68 | 27.24 | 43.23 | 17.89 | 16.63 | 11.81 |
| 2011 | | 9.67 | | 11.75 | | 13.88 | | 8.51 |
| 2012 | 7.88 | 10.33 | 10.04 | 15.12 | 12.98 | 15.61 | 11.70 | 9.07 |
| 2017 | 15.27 | 22.90 | 14.95 | 34.91 | 20.55 | 20.51 | 23.87 | 13.97 |
| 2021 | 5.89 | 13.35 | 2.42 | 7.69 | 10.02 | 11.43 | 13.59 | 13.18 |




| | Lost Ck | Mulberry Fork | Village Ck | Locust Fork | Valley Ck | Mid | Big Yellow Ck | Lower |
|---|---|---|---|---|---|---|---|---|
| 1998 | 5.7 | 5.9 | | 14.6 | 6.4 | 7.4 | | 2.4 |
| 2002 | 9.4 | 11.3 | 7.9 | 13.6 | 11.9 | 7.9 | 7.9 | 6.9 |
| 2003 | | 7.9 | | 10.3 | | 7.4 | | 7.7 |
| 2006 | | 6.4 | | 10.7 | | 6.1 | | 5.0 |
| 2007 | 5.4 | 5.5 | 16.1 | 9.5 | 7.7 | 4.2 | 4.4 | 2.7 |
| 2011 | | 3.4 | | 11.0 | | 3.2 | | 1.9 |
| 2012 | 1.9 | 0.9 | 5.7 | 4.1 | 3.1 | 1.3 | 1.7 | 1.0 |
| 2017 | 4.4 | 3.4 | 8.1 | 7.7 | 8.1 | 4.0 | 2.8 | 3.4 |
| 2021 | 9.9 | 9.3 | 7.9 | 19.9 | 9.0 | 10.0 | 4.6 | 6.4 |

Figure 4. Monthly TN concentrations measured in Bankhead Reservoir, April-October 2017 and 2021. Each bar graph depicts monthly changes in each station. The historic mean (1992-2021) and min/max ranges are also displayed for comparison. The "n" value equals the number of datapoints included in the monthly historic calculations. Discharge provided by APCO and USGS.

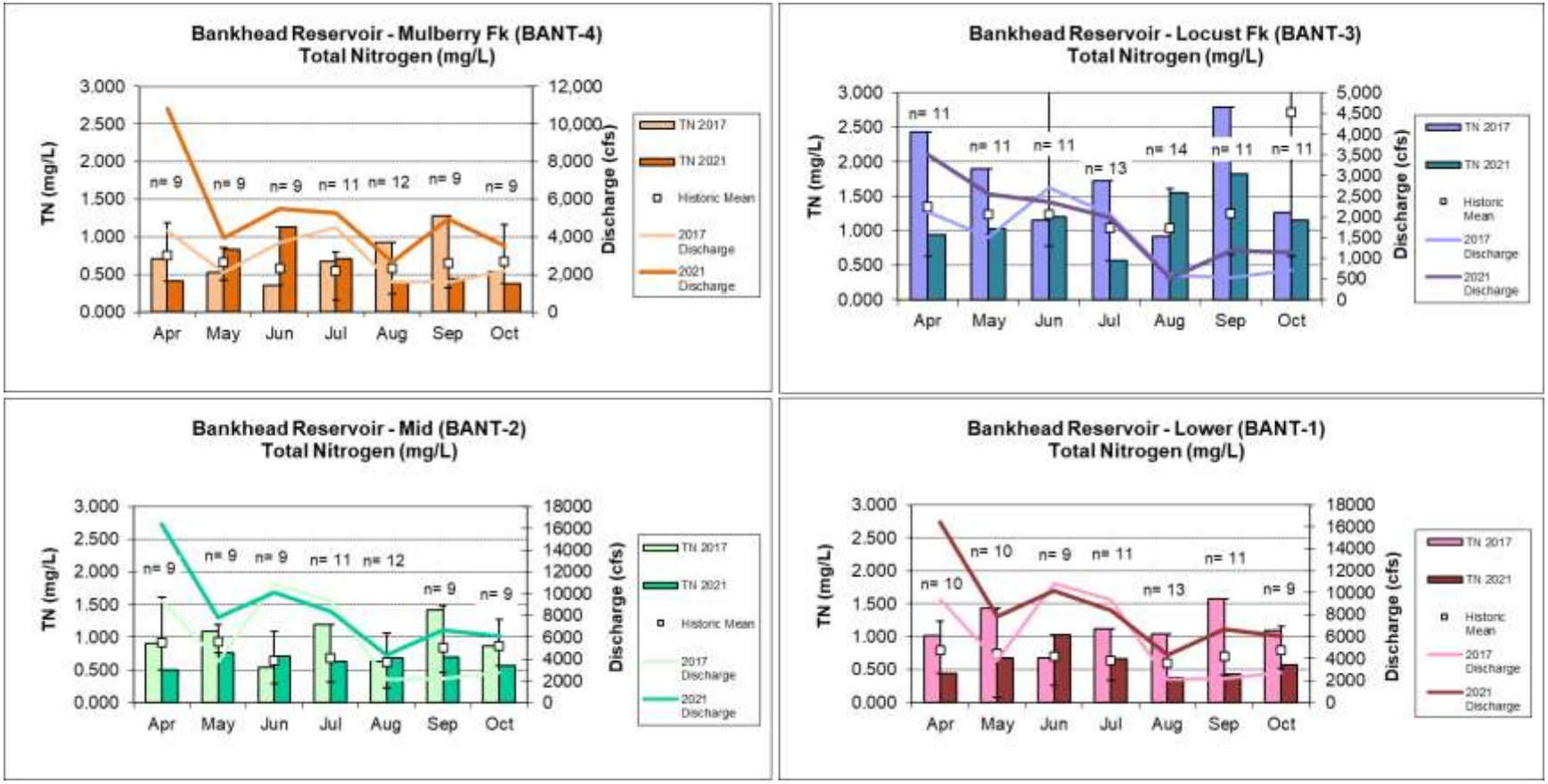


Figure 5. Monthly TP concentrations measured in Bankhead Reservoir, April-October 2017 and 2021. Each bar graph depicts monthly changes in each station. The historic mean (1992-2021) and min/max ranges are also displayed for comparison. The "n" value equals the number of datapoints included in the monthly historic calculations. Discharge provided by APCO and USGS.

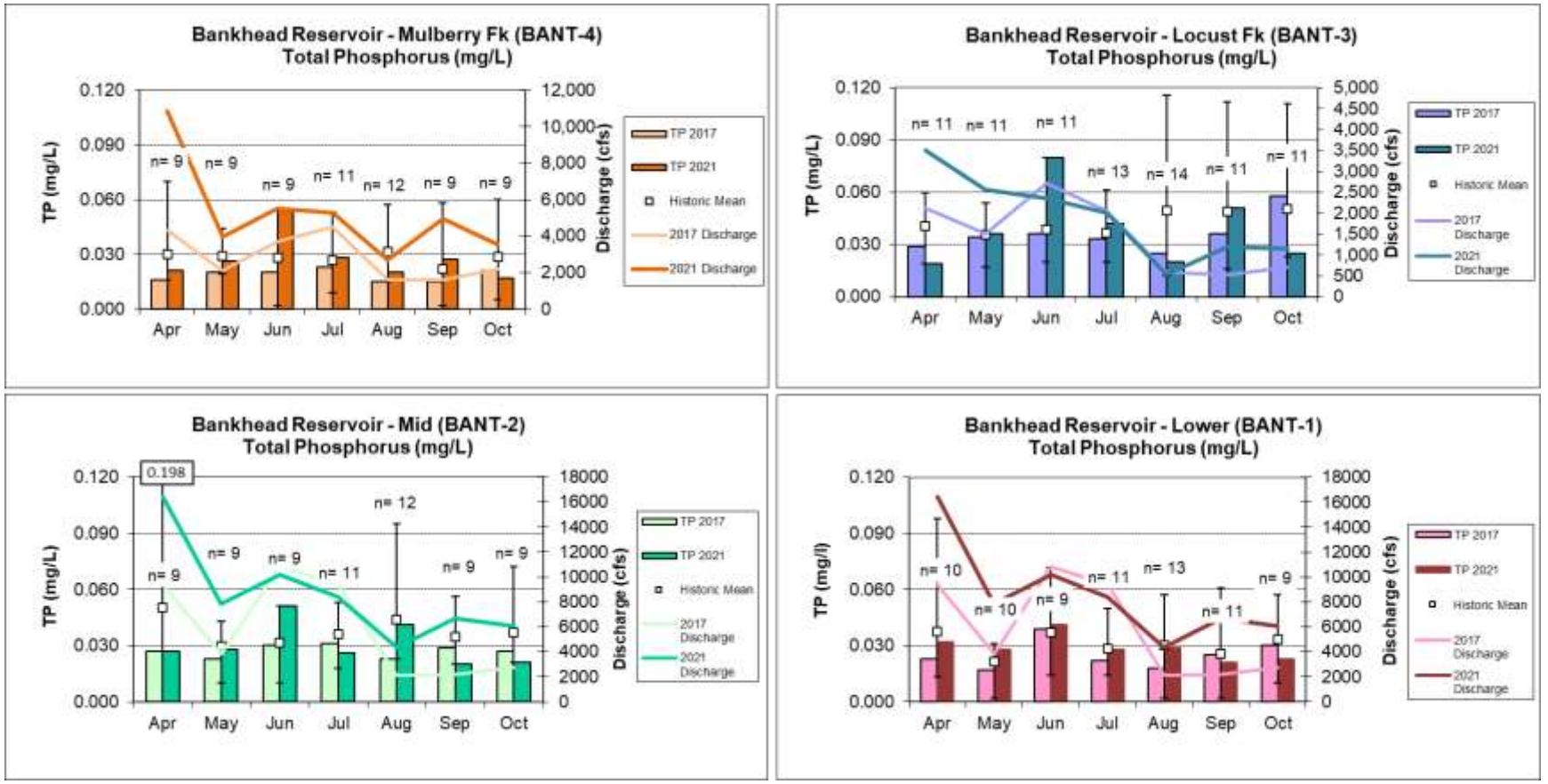


Figure 6. Monthly chl *a* concentrations measured in Bankhead Reservoir, April-October 2017 and 2021. Each bar graph depicts monthly changes in each station. The historic mean (1992-2021) and min/max ranges are also displayed for comparison. The "n" value equals the number of datapoints included in the monthly historic calculations. Discharge provided by APCO and USGS.

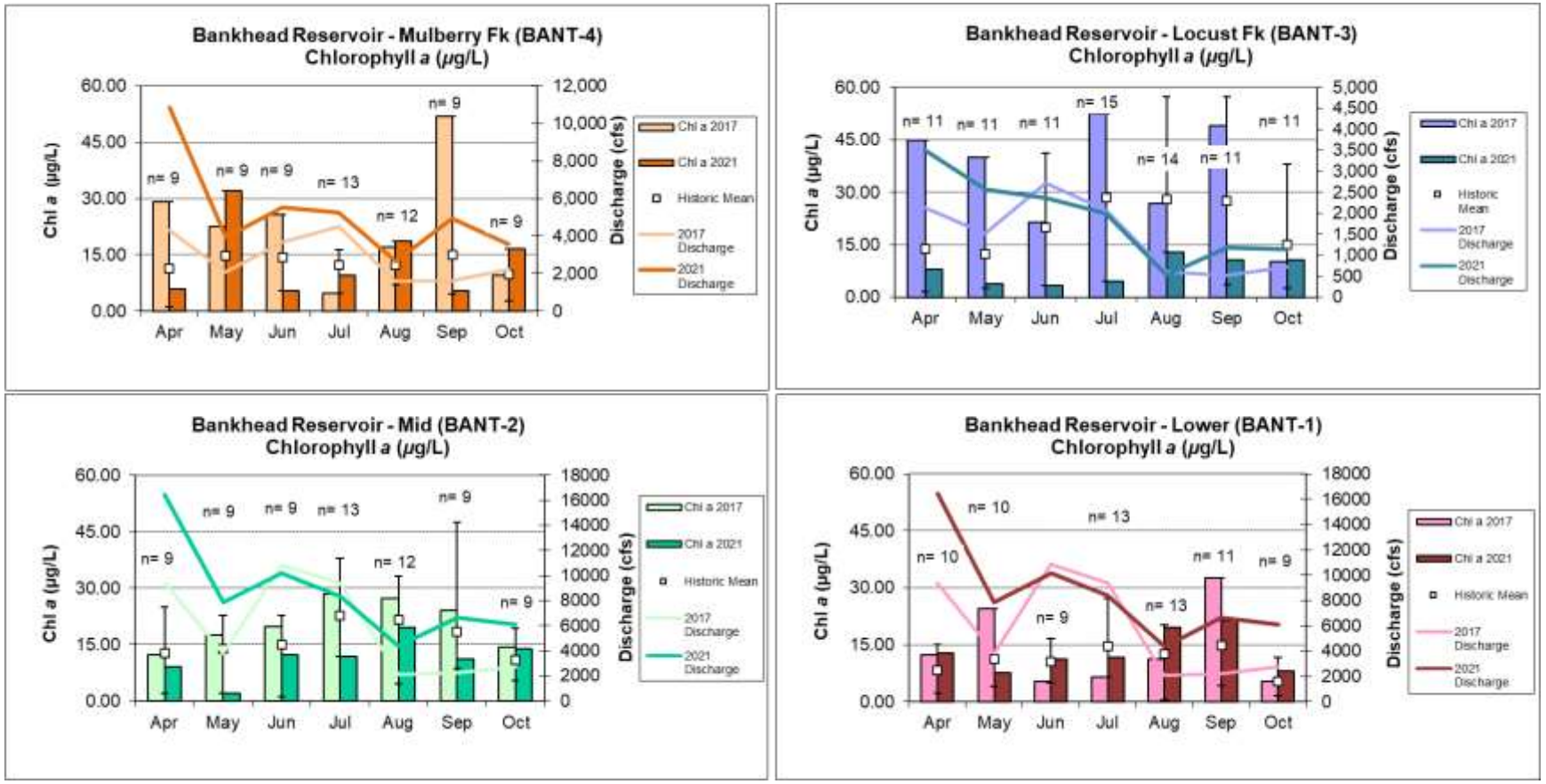


Figure 7. Monthly TSS concentrations measured in Bankhead Reservoir, April-October 2017 and 2021. Each bar graph depicts monthly changes in each station. The historic mean (1992-2021) and min/max ranges are also displayed for comparison. The "n" value equals the number of datapoints included in the monthly historic calculations. Discharge provided by APCO and USGS.

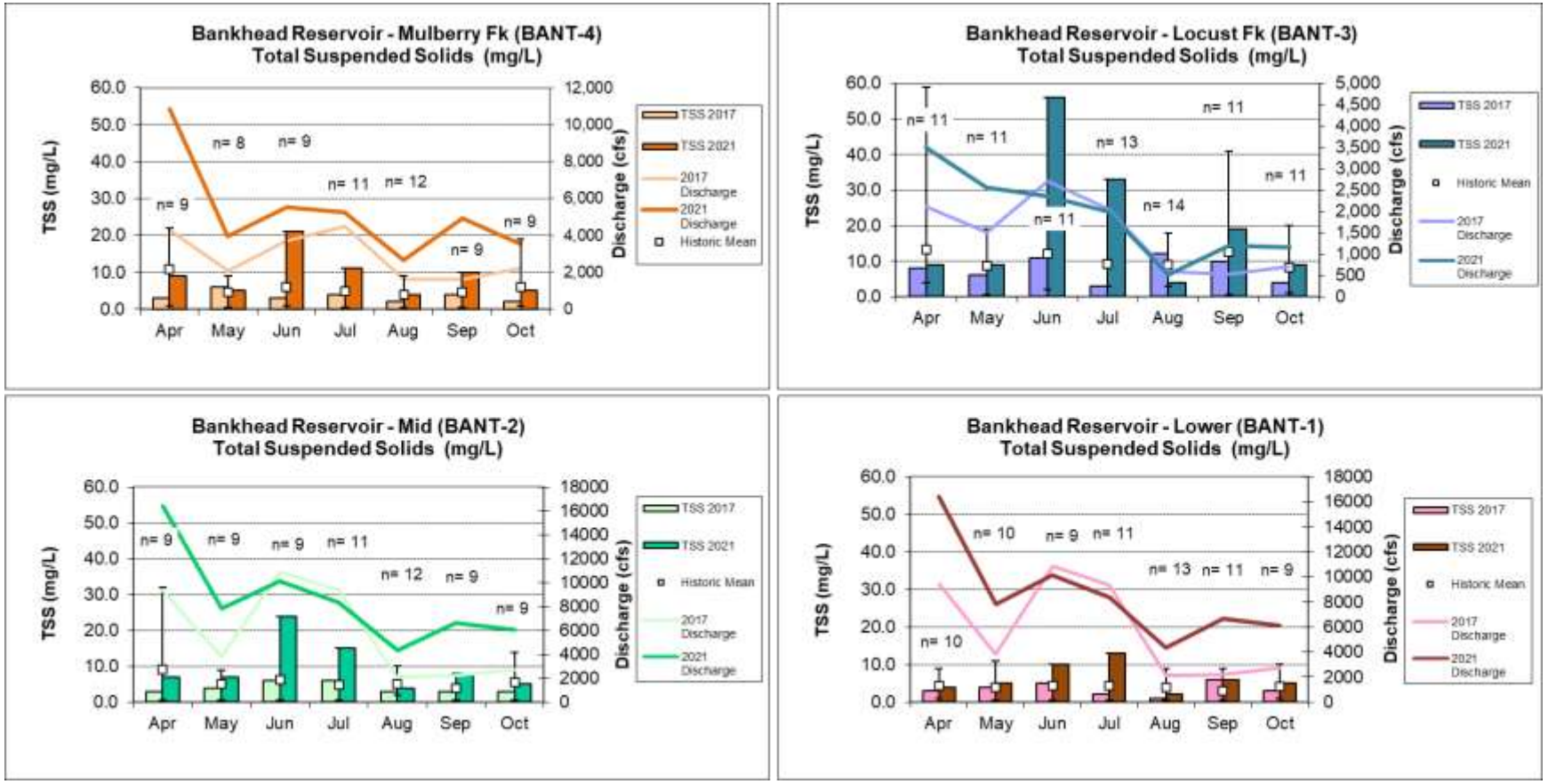
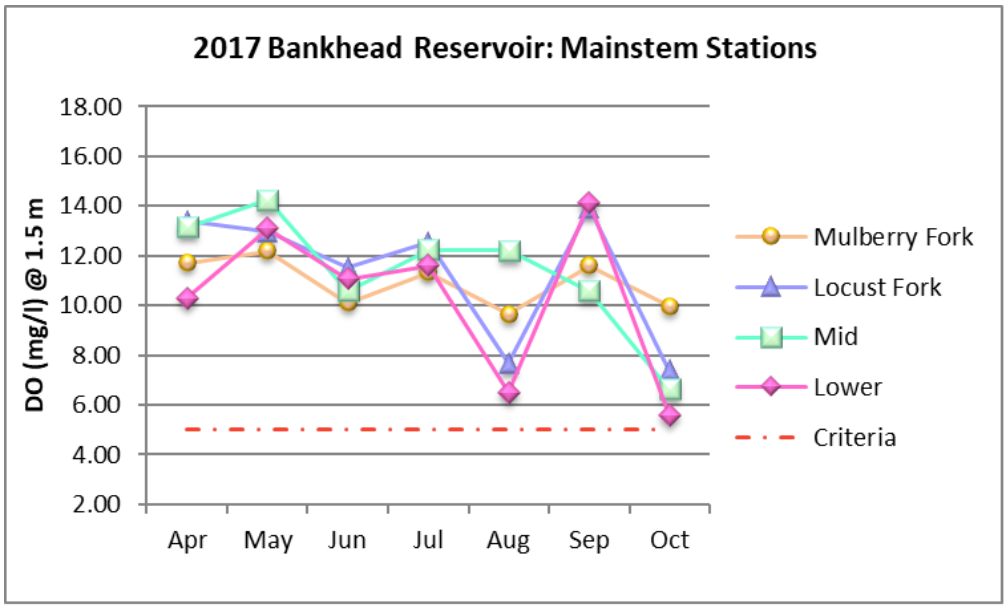


Table 2. Algal growth potential test results, Bankhead Reservoir 1998-2017 (expressed as mean Maximum Standing Crop (MSC) dry weights of *Selenastrum capricornutum* in mg/L) and limiting nutrient status. MSC values below 5 mg/L are considered to be protective in reservoirs and lakes; values below 20 mg/L MSC are considered protective of flowing streams and rivers. (Raschke and Schultz 1987).

| Station | Mulberry Fork (BANT-4) | | Locust Fork (BANT-3) | | Mid (BANT-2) | | Lower (BANT-1) | |
|---|---|---|---|---|---|---|---|---|
| | MSC | Limiting Nutrient | MSC | Limiting Nutrient | MSC | Limiting Nutrient | MSC | Limiting Nutrient |
| August 1998 | 2.31 | Phosphorus | 24.74 | Phosphorus | 4.52 | Phosphorus | 2.65 | Phosphorus |
| August 2002 | 6.95 | Phosphorus | 15.91 | Phosphorus | 9.61 | Co-limiting | 3.56 | Co-limiting |
| June 2007 | 2.05 | Phosphorus | 2.34 | Phosphorus | 2.11 | Phosphorus | 2.23 | Phosphorus |
| July 2007 | 2.68 | Phosphorus | 3.44 | Phosphorus | 3.42 | Nitrogen | 2.29 | Nitrogen |
| August 2007 | 2.42 | Phosphorus | 9.53 | Nitrogen | 2.41 | Nitrogen | 2.40 | Nitrogen |
| August 2012 | 9.25 | Phosphorus | 39.24 | Phosphorus | 22.24 | Nitrogen | 17.43 | Co-limiting |
| August 2017 | 7.89 | Non-Limiting | 23.91 | Phosphorus | 21.68 | Phosphorus | ----- | ------- |

Figure 8. Monthly DO concentrations at 1.5 m (5 ft) for Bankhead Reservoir stations collected April-October 2017. ADEM Water Quality Criteria pertaining to reservoir waters require a minimum DO concentration of 5.0 mg/L at this depth (ADEM Admin. Code R. 335-6-10-.09).



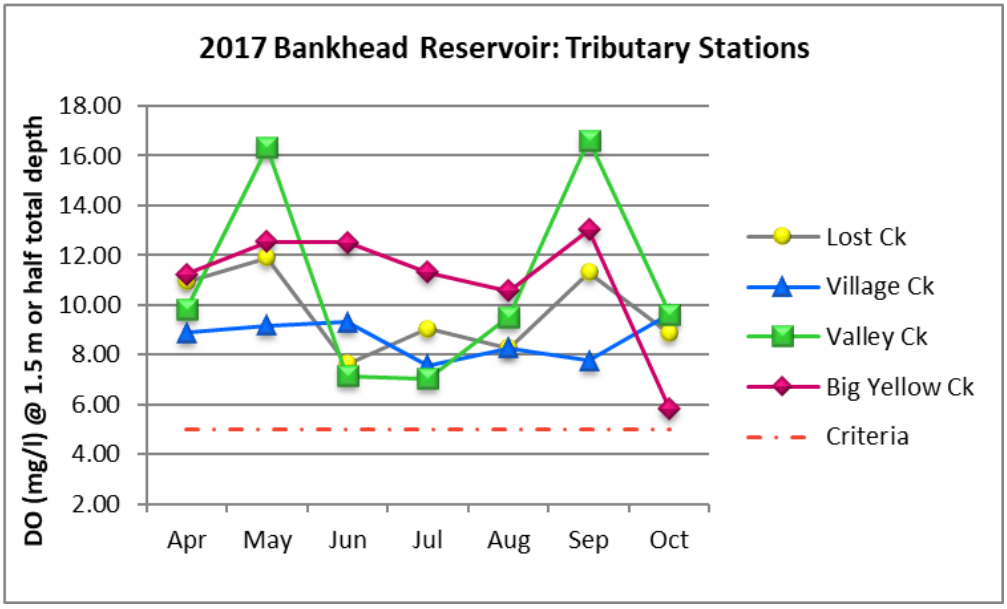
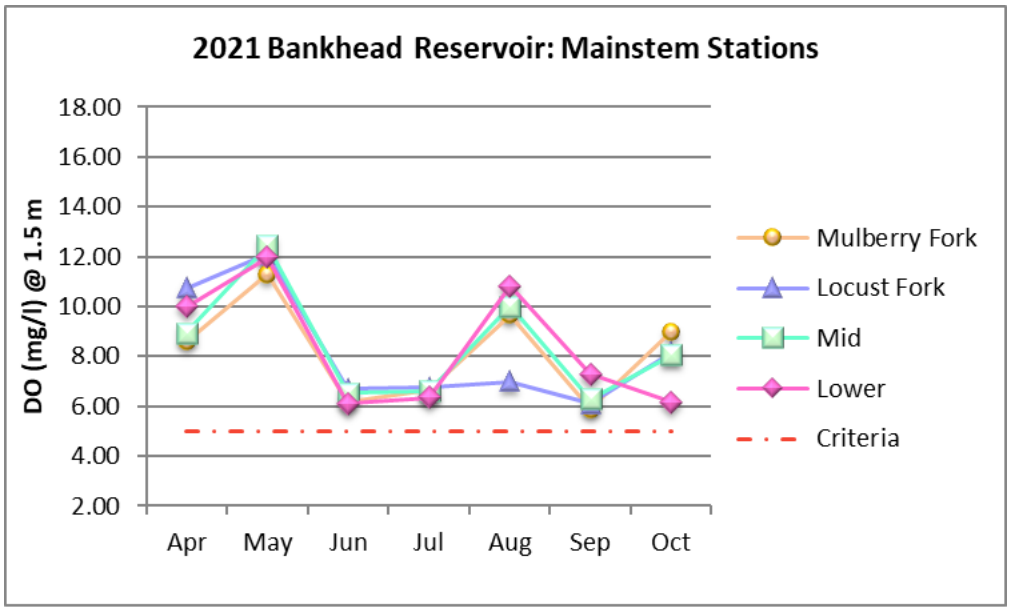



Figure 9. Monthly DO concentrations at 1.5 m (5 ft) for Bankhead Reservoir stations collected April-October 2021. ADEM Water Quality Criteria pertaining to reservoir waters require a minimum DO concentration of 5.0 mg/L at this depth (ADEM Admin. Code R. 335-6-10-.09).



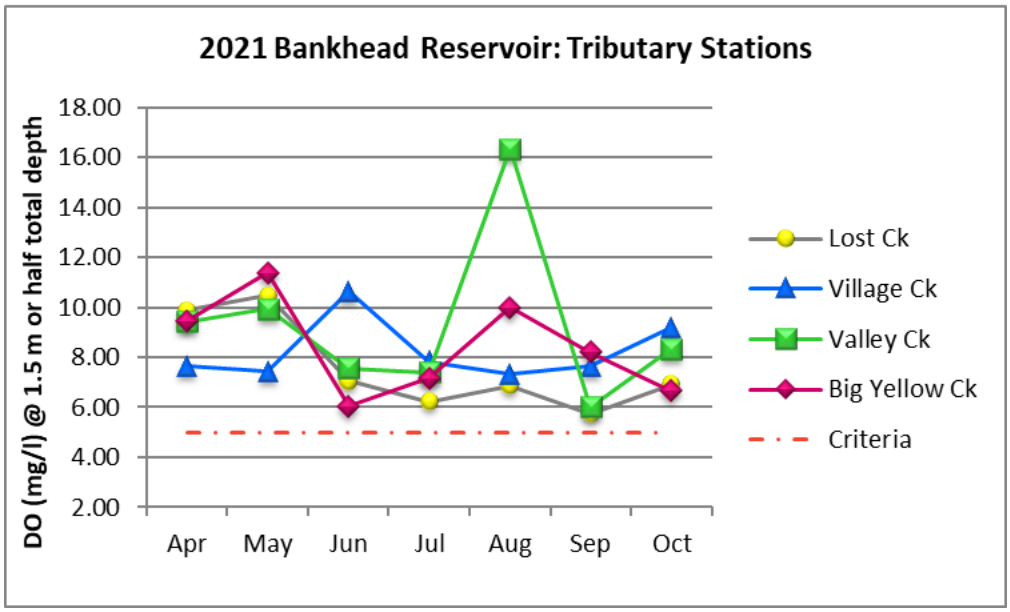



Figure 10. Monthly depth profiles of dissolved oxygen, temperature, and conductivity in the lower Bankhead Reservoir station, April-October 2017.

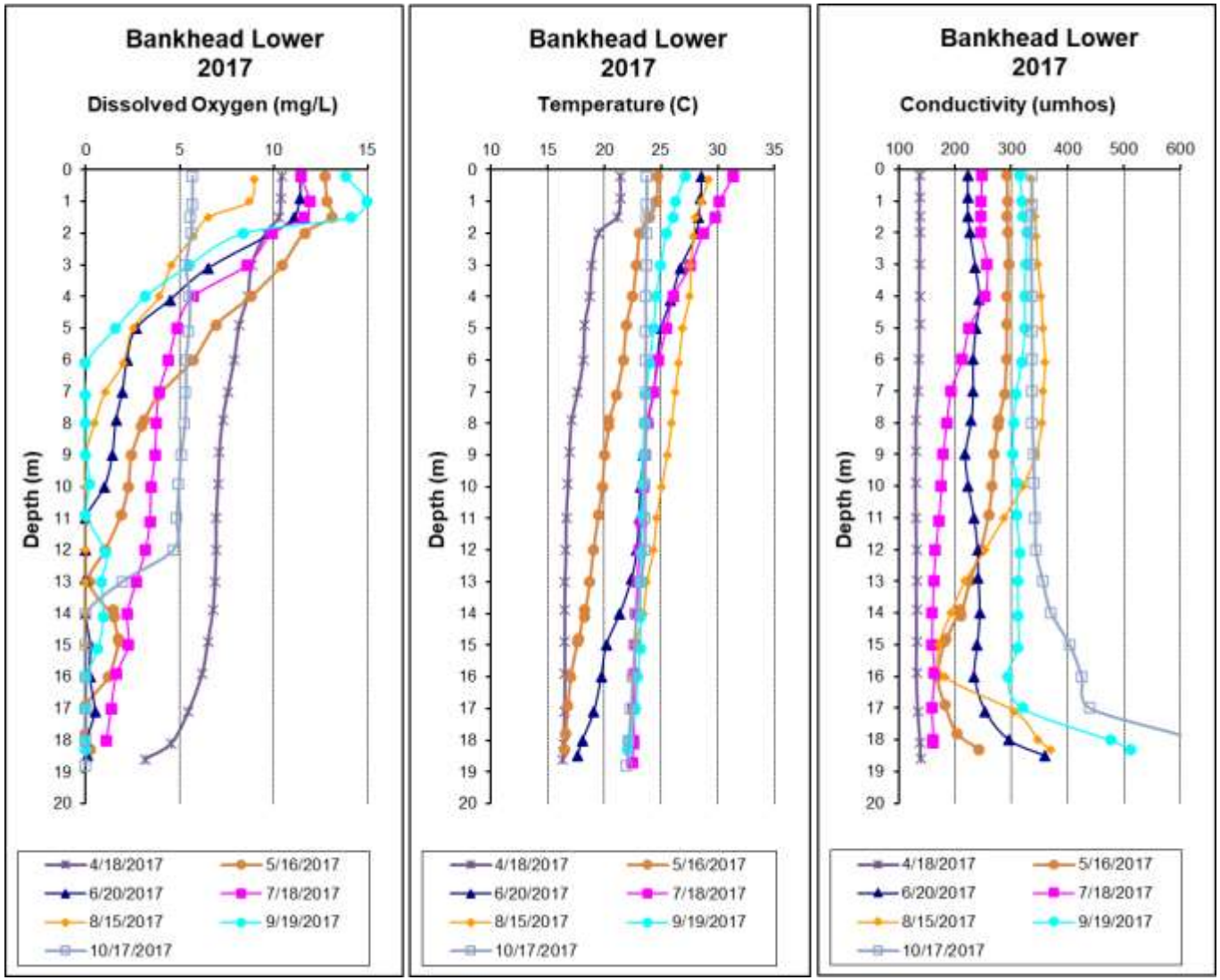


Figure 11. Monthly depth profiles of dissolved oxygen, temperature, and conductivity in the mid Bankhead Reservoir station, April-October 2017.

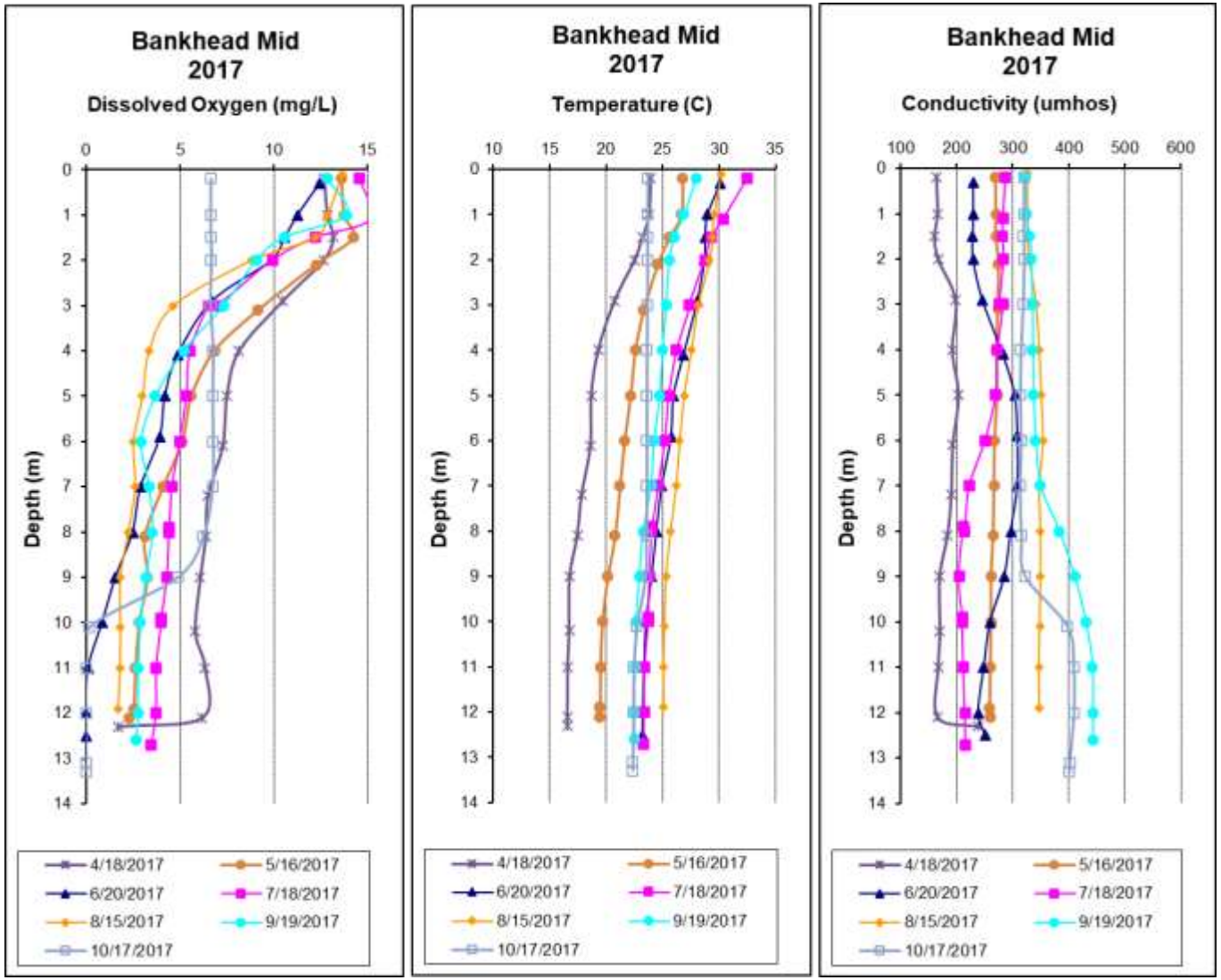


Figure 12. Monthly depth profiles of dissolved oxygen, temperature, and conductivity in the lower Bankhead Reservoir station, April-October 2021.

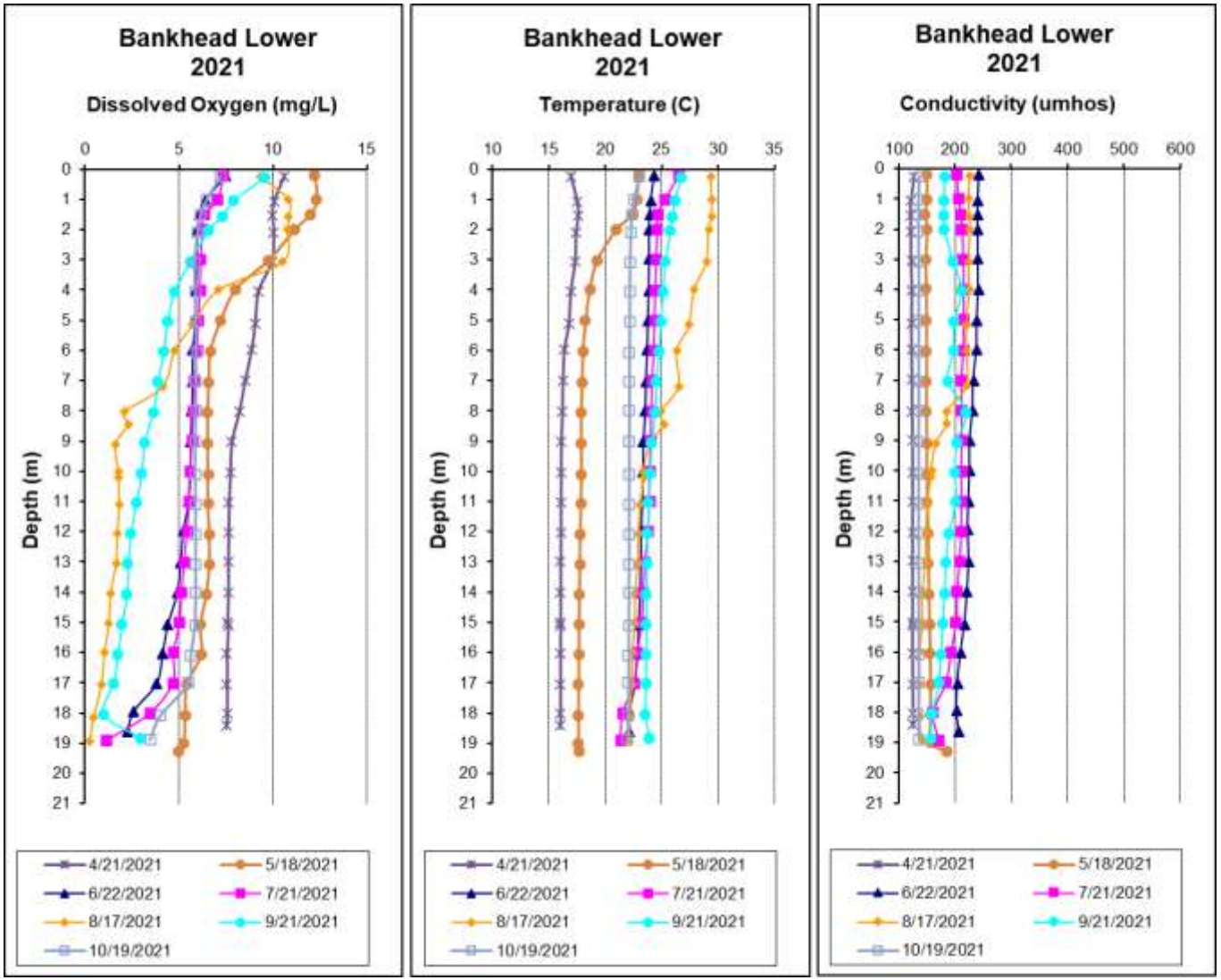


Figure 13. Monthly depth profiles of dissolved oxygen, temperature, and conductivity in the mid Bankhead Reservoir station, April-October 2021.

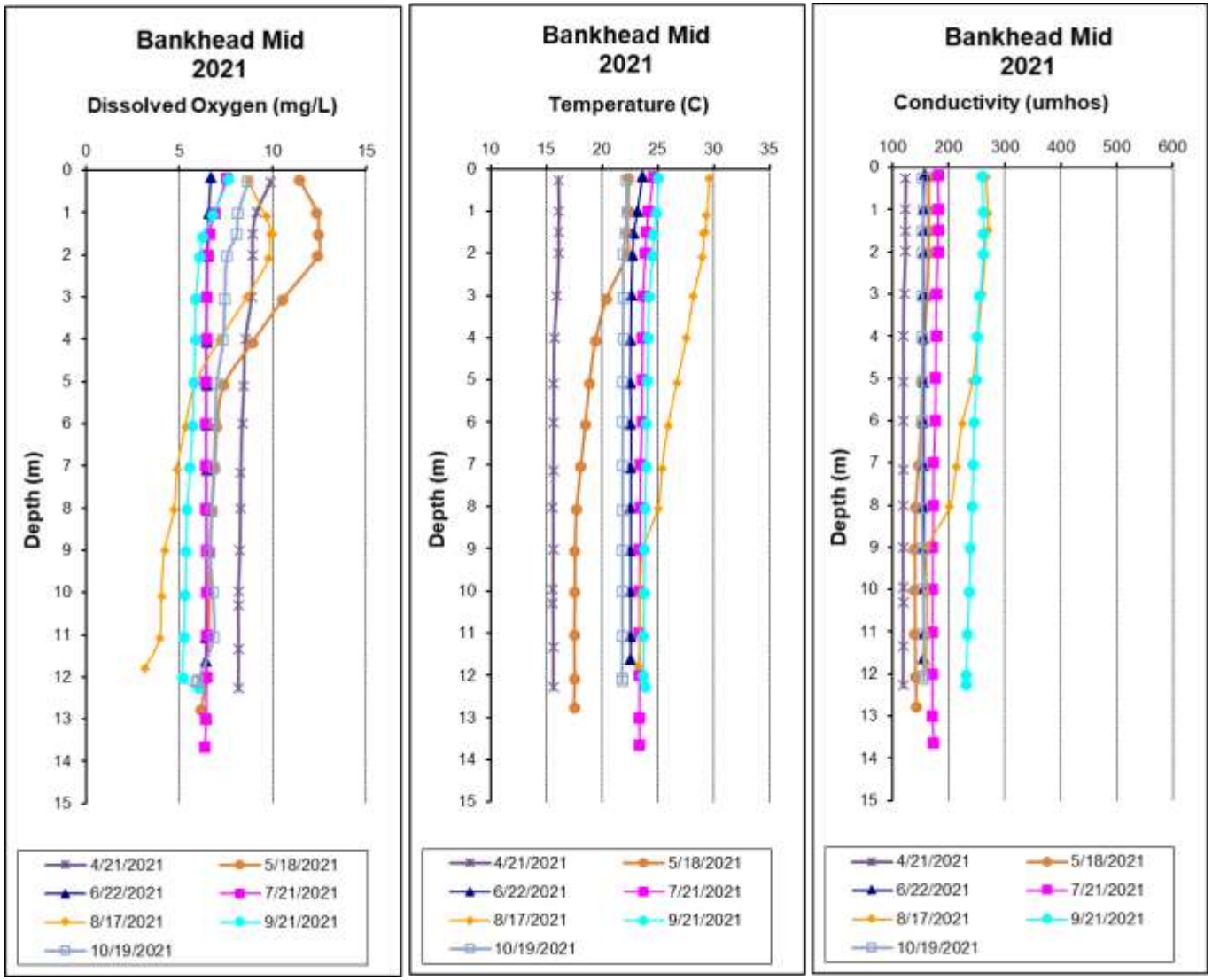
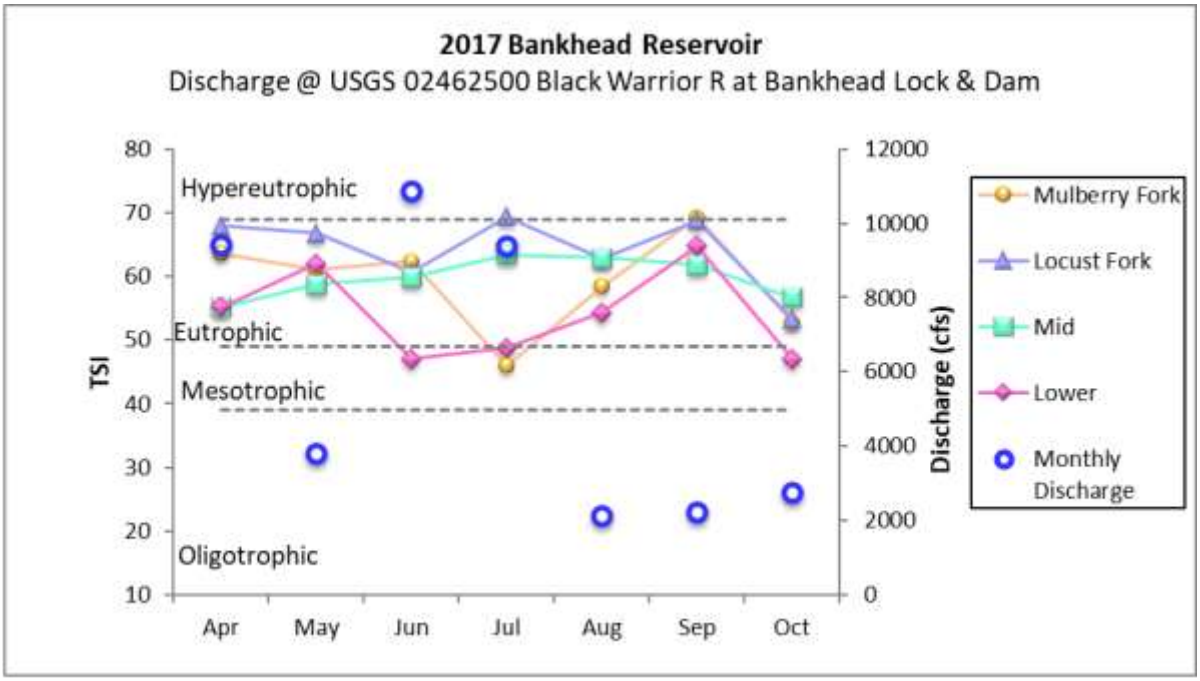


Figure 14. Monthly TSI values calculated for mainstem and tributary Bankhead Reservoir stations in 2017 using chl *a* concentrations and Carlson's Trophic State Index calculation (Carlson 1977). Monthly TSI for mainstem stations were plotted vs. the closest mean monthly discharge (USGS 02462500 Black Warrior River at Bankhead Lock & Dam near Bessemer, AL).



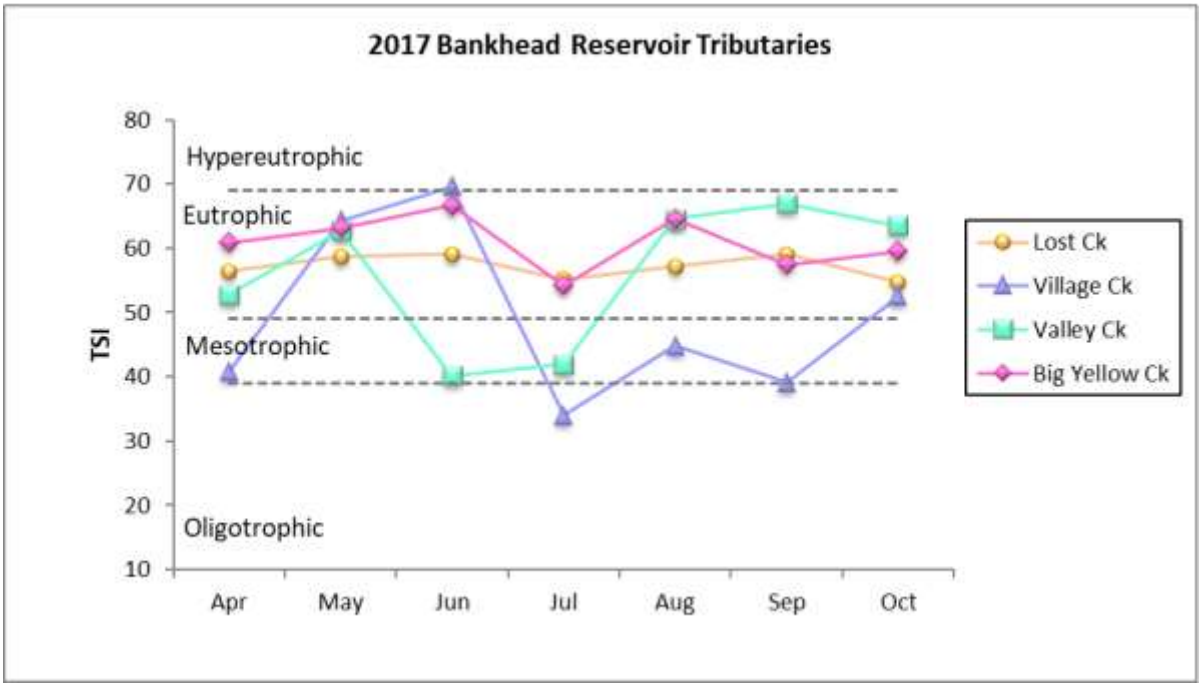
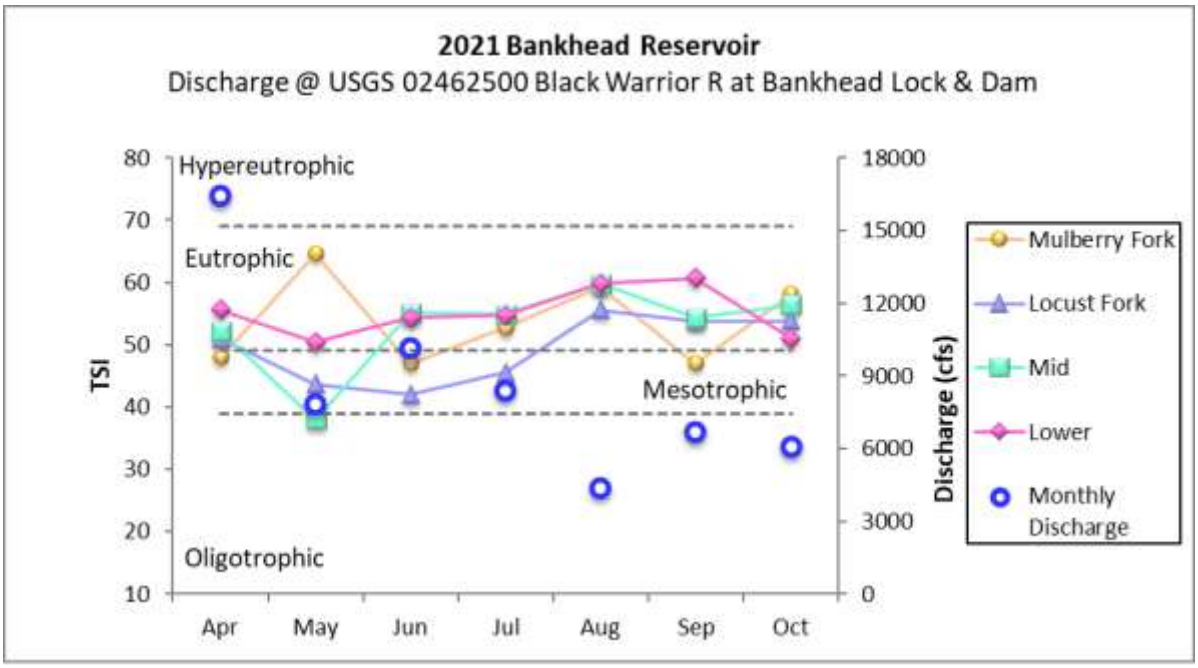
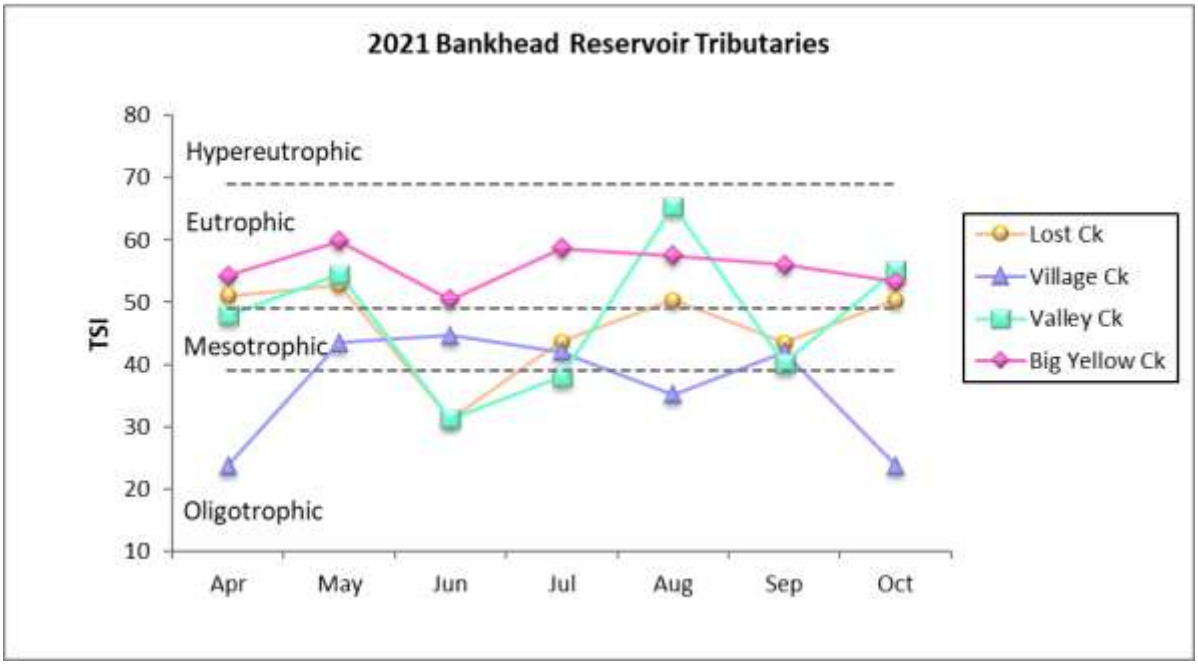



Figure 15. Monthly TSI values calculated for mainstem and tributary Bankhead Reservoir stations in 2021 using chl *a* concentrations and Carlson's Trophic State Index calculation (Carlson 1977). Monthly TSI for mainstem stations were plotted vs. the closest mean monthly discharge (USGS 02462500 Black Warrior River at Bankhead Lock & Dam near Bessemer, AL.



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# APPENDIX

Appendix Table 1. Summary of Bankhead Reservoir water quality data collected April-October 2017. Minimum (min) and maximum (max) values calculated using minimum detection limits when results were less than this value. Median (med), mean, and standard deviation (SD) values were calculated by multiplying the MDL by 0.5 when results were less than this value.

| Station | Parameter | N | Min | Max | Med | Avg | SD |
|---|---|---|---|---|---|---|---|
| **BANT-1** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 2.6 | 4.6 | 3.2 | 3.3 | 0.7 |
| | Total Dissolved Solids (mg/L) | 7 | 84.0 | 194.0 | 164.0 | 150.4 | 44.7 |
| | Total Suspended Solids (mg/L) | 7 | 1.0 | 6.0 | 3.0 | 3.4 | 1.7 |
| | Hardness (mg/L) | 4 | 84.6 | 132.0 | 103.4 | 105.8 | 21.7 |
| | Alkalinity (mg/L) | 7 | 32.3 | 77.8 | 66.1 | 63.4 | 16.3 |
| | Photic Zone (m) | 7 | 3.01 | 5.25 | 4.57 | 4.48 | 0.76 |
| | Secchi (m) | 7 | 0.88 | 1.92 | 1.50 | 1.47 | 0.36 |
| | Bottom Depth (m) | 7 | 18.3 | 18.8 | 18.5 | 18.5 | 0.2 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L)[J] | 7 | < 0.004 | 0.023 | 0.004 | 0.007 | 0.008 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.113 | 0.550 | 0.471 | 0.376 | 0.183 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | 0.539 | 1.460 | 0.566 | 0.760 | 0.356 |
| | Total Nitrogen (mg/L) | 7 | 2.031 | 4.719 | 1.100 | 1.137 | 0.292 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | 0.002 | 0.014 | 0.003 | 0.005 | 0.004 |
| | Total Phosphorus (mg/L) | 7 | 0.017 | 0.039 | 0.023 | 0.025 | 0.008 |
| | CBOD-5 (mg/L)[J] | 6 | < 2.0 | 5.2 | 2.4 | 2.6 | 1.4 |
| | Chlorides (mg/L) | 7 | 3.1 | 6.8 | 5.5 | 4.9 | 1.2 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 5.34 | 32.60 | 11.20 | 13.97 | 10.62 |
| | E. coli (MPN/DL)[J] | 4 | 1 | 2 | 1 | 1 | 1 |
| **BANT-2** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 3.6 | 7.3 | 3.8 | 4.4 | 1.3 |
| | Total Dissolved Solids (mg/L) | 7 | 99.0 | 203.0 | 167.0 | 162.7 | 36.9 |
| | Total Suspended Solids (mg/L) | 7 | 3.0 | 6.0 | 3.0 | 4.0 | 1.4 |
| | Hardness (mg/L) | 4 | 89.6 | 136.0 | 112.5 | 112.6 | 19.9 |
| | Alkalinity (mg/L) | 7 | 38.2 | 75.3 | 65.2 | 62.9 | 12.5 |
| | Photic Zone (m) | 7 | 3.03 | 4.40 | 4.13 | 3.94 | 0.49 |
| | Secchi (m) | 7 | 0.94 | 1.45 | 1.03 | 1.11 | 0.19 |
| | Bottom Depth (m) | 7 | 11.9 | 13.3 | 12.5 | 12.5 | 0.5 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < 0.004 | 0.022 | 0.002 | 0.005 | 0.007 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.066 | 0.596 | 0.285 | 0.326 | 0.186 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | 0.372 | 1.220 | 0.491 | 0.625 | 0.300 |
| | Total Nitrogen (mg/L) | 7 | 1.632 | 4.242 | 0.908 | 0.951 | 0.308 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | < 0.002 | 0.008 | 0.003 | 0.003 | 0.002 |
| | Total Phosphorus (mg/L) | 7 | 0.023 | 0.031 | 0.027 | 0.027 | 0.003 |
| | CBOD-5 (mg/L)[J] | 6 | < 2.0 | 3.5 | 2.6 | 2.4 | 0.8 |
| | Chlorides (mg/L) | 7 | 3.0 | 6.1 | 5.0 | 4.7 | 1.0 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 12.30 | 28.30 | 19.80 | 20.51 | 6.21 |
| | E. coli (MPN/DL)[J] | 4 | 1 | 1 | 1 | 1 | 0 |

| Station | Parameter | N | Min | Max | Med | Avg | SD |
|---|---|---|---|---|---|---|---|
| **BANT-3** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 7.5 | 20.4 | 8.1 | 10.8 | 4.9 |
| | Total Dissolved Solids (mg/L) | 7 | 127.0 | 247.0 | 190.0 | 192.0 | 41.5 |
| | Total Suspended Solids (mg/L) | 7 | 3.0 | 12.0 | 8.0 | 7.7 | 3.5 |
| | Hardness (mg/L) | 4 | 93.0 | 172.0 | 146.5 | 139.5 | 34.0 |
| | Alkalinity (mg/L) | 7 | 53.3 | 91.5 | 78.5 | 74.8 | 14.4 |
| | Photic Zone (m) | 7 | 1.90 | 3.21 | 2.92 | 2.73 | 0.48 |
| | Secchi (m) | 7 | 0.54 | 0.89 | 0.80 | 0.76 | 0.12 |
| | Bottom Depth (m) | 7 | 6.1 | 6.7 | 6.5 | 6.4 | 0.2 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < 0.004 | 0.007 | 0.002 | 0.003 | 0.001 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.348 | 1.210 | 0.743 | 0.769 | 0.302 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | 0.488 | 2.250 | 0.570 | 0.973 | 0.664 |
| | Total Nitrogen (mg/L) | 7 | 2.754 | 8.370 | 1.725 | 1.742 | 0.691 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | 0.003 | 0.038 | 0.005 | 0.010 | 0.013 |
| | Total Phosphorus (mg/L) | 7 | 0.025 | 0.058 | 0.034 | 0.036 | 0.010 |
| | CBOD-5 (mg/L)[J] | 6 | 2.1 | 5.2 | 3.0 | 3.3 | 1.1 |
| | Chlorides (mg/L) | 7 | 3.1 | 6.7 | 6.0 | 5.5 | 1.3 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 10.10 | 52.30 | 40.00 | 34.91 | 15.77 |
| | E. coli (MPN/DL)[J] | 4 | 1 | 9 | 2 | 3 | 4 |
| **BANT-4** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 4.0 | 5.4 | 4.7 | 4.7 | 0.5 |
| | Total Dissolved Solids (mg/L) | 7 | 56.0 | 152.0 | 110.0 | 105.6 | 30.3 |
| | Total Suspended Solids (mg/L) | 7 | 2.0 | 6.0 | 3.0 | 3.4 | 1.4 |
| | Hardness (mg/L) | 4 | 68.9 | 92.6 | 74.7 | 77.7 | 10.3 |
| | Alkalinity (mg/L) | 7 | 28.8 | 48.3 | 41.4 | 40.8 | 5.8 |
| | Photic Zone (m) | 7 | 3.77 | 4.79 | 4.17 | 4.14 | 0.35 |
| | Secchi (m) | 7 | 1.00 | 1.53 | 1.22 | 1.24 | 0.18 |
| | Bottom Depth (m) | 7 | 10.9 | 12.1 | 11.7 | 11.6 | 0.4 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < 0.004 | 0.007 | 0.002 | 0.003 | 0.001 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.062 | 0.204 | 0.126 | 0.134 | 0.045 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | 0.216 | 1.220 | 0.468 | 0.582 | 0.337 |
| | Total Nitrogen (mg/L) | 7 | 1.074 | 3.846 | 0.672 | 0.716 | 0.306 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | < 0.002 | 0.005 | 0.003 | 0.003 | 0.001 |
| | Total Phosphorus (mg/L) | 7 | 0.015 | 0.023 | 0.020 | 0.019 | 0.003 |
| | CBOD-5 (mg/L)[J] | 6 | < 2.0 | 2.6 | 2.2 | 1.9 | 0.7 |
| | Chlorides (mg/L) | 7 | 2.4 | 4.3 | 3.7 | 3.5 | 0.6 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 4.81 | 51.80 | 22.40 | 22.90 | 15.37 |
| | E. coli (MPN/DL)[J] | 4 | 1 | 3 | 1 | 2 | 1 |

| Station | Parameter | N | Min | Max | Med | Avg | SD |
|---|---|---|---|---|---|---|---|
| **BANT-5** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 4.5 | 6.2 | 4.9 | 5.1 | 0.7 |
| | Total Dissolved Solids (mg/L) | 7 | 155.0 | 266.0 | 195.0 | 205.7 | 40.7 |
| | Total Suspended Solids (mg/L) | 7 | 2.0 | 6.0 | 5.0 | 4.4 | 1.3 |
| | Hardness (mg/L) | 4 | 104.0 | 167.0 | 118.5 | 127.0 | 27.5 |
| | Alkalinity (mg/L) | 7 | 58.0 | 95.3 | 69.9 | 74.2 | 15.2 |
| | Photic Zone (m) | 7 | 3.27 | 4.11 | 3.83 | 3.73 | 0.29 |
| | Secchi (m) | 7 | 1.12 | 1.59 | 1.24 | 1.27 | 0.17 |
| | Bottom Depth (m) | 7 | 11.8 | 13.8 | 13.2 | 13.1 | 0.8 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < 0.004 | 0.007 | 0.002 | 0.003 | 0.001 |
| | Nitrate+Nitrite Nitrogen (mg/L)[J] | 7 | 0.008 | 0.270 | 0.142 | 0.126 | 0.086 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | 0.152 | 1.000 | 0.422 | 0.514 | 0.276 |
| | Total Nitrogen (mg/L)[J] | 7 | 0.756 | 3.024 | 0.692 | 0.640 | 0.263 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | 0.002 | 0.003 | 0.003 | 0.003 | 0.000 |
| | Total Phosphorus (mg/L) | 7 | 0.014 | 0.022 | 0.015 | 0.016 | 0.003 |
| | CBOD-5 (mg/L)[J] | 6 | < 2.0 | 2.8 | 2.1 | 1.9 | 0.7 |
| | Chlorides (mg/L) | 7 | 2.4 | 3.6 | 3.2 | 3.1 | 0.4 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 11.70 | 18.20 | 15.00 | 15.27 | 2.77 |
| | E. coli (MPN/DL)[J] | 4 | 1 | 26 | 5 | 9 | 11 |
| **BANT-6** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 5.2 | 43.8 | 7.9 | 14.0 | 14.0 |
| | Total Dissolved Solids (mg/L)[J] | 7 | 76.0 | 313.0 | 229.0 | 228.6 | 81.0 |
| | Total Suspended Solids (mg/L) | 7 | 4.0 | 20.0 | 7.0 | 8.1 | 5.5 |
| | Hardness (mg/L) | 4 | 93.0 | 140.0 | 125.5 | 121.0 | 22.0 |
| | Alkalinity (mg/L) | 7 | 67.7 | 134.0 | 101.0 | 101.7 | 23.6 |
| | Photic Zone (m) | 7 | 1.18 | 4.51 | 2.61 | 2.71 | 1.03 |
| | Secchi (m) | 7 | 0.74 | 1.36 | 0.85 | 0.90 | 0.21 |
| | Bottom Depth (m) | 7 | 7.9 | 8.9 | 8.2 | 8.3 | 0.4 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < 0.004 | 0.102 | 0.004 | 0.022 | 0.038 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.585 | 1.930 | 0.816 | 1.057 | 0.499 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | 0.317 | 1.320 | 0.627 | 0.767 | 0.367 |
| | Total Nitrogen (mg/L) | 7 | 3.933 | 8.010 | 1.639 | 1.824 | 0.485 |
| | Dis Reactive Phosphorus (mg/L) | 7 | 0.021 | 0.126 | 0.063 | 0.069 | 0.039 |
| | Total Phosphorus (mg/L) | 7 | 0.054 | 0.153 | 0.090 | 0.101 | 0.040 |
| | CBOD-5 (mg/L)[J] | 6 | < 2.0 | 3.9 | 2.2 | 2.3 | 1.4 |
| | Chlorides (mg/L) | 7 | 3.6 | 10.1 | 6.9 | 6.8 | 2.6 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 2.67 | 40.90 | 26.70 | 20.55 | 15.23 |
| | E. coli (MPN/DL)[J] | 4 | 1 | 687 | 55 | 199 | 329 |

| Station | Parameter | N | | Min | Max | Med | Avg | SD |
|---|---|---|---|---|---|---|---|---|
| **BANT-7** | **Physical** | | | | | | | |
| | Turbidity (NTU) | 7 | | 2.0 | 3.8 | 3.0 | 3.0 | 0.6 |
| | Total Dissolved Solids (mg/L) | 7 | | 90.0 | 174.0 | 148.0 | 144.7 | 29.1 |
| | Total Suspended Solids (mg/L) | 7 | < | 1.0 | 5.0 | 3.0 | 2.8 | 1.5 |
| | Hardness (mg/L) | 4 | | 77.9 | 112.0 | 94.0 | 94.4 | 17.1 |
| | Alkalinity (mg/L) | 7 | | 30.5 | 73.6 | 57.9 | 58.7 | 15.5 |
| | Photic Zone (m) | 7 | | 3.80 | 5.11 | 4.60 | 4.54 | 0.50 |
| | Secchi (m) | 7 | | 0.96 | 2.04 | 1.69 | 1.66 | 0.41 |
| | Bottom Depth (m) | 7 | | 17.2 | 18.4 | 17.7 | 17.8 | 0.4 |
| | **Chemical** | | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < | 0.004 | 0.007 | 0.002 | 0.003 | 0.001 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | | 0.068 | 0.444 | 0.304 | 0.277 | 0.142 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | | 0.349 | 0.986 | 0.713 | 0.707 | 0.256 |
| | Total Nitrogen (mg/L) | 7 | | 1.950 | 4.116 | 1.035 | 0.984 | 0.296 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | < | 0.002 | 0.005 | 0.002 | 0.002 | 0.001 |
| | Total Phosphorus (mg/L) | 7 | | 0.016 | 0.038 | 0.018 | 0.022 | 0.008 |
| | CBOD-5 (mg/L)[J] | 6 | < | 2.0 | 2.8 | 1.7 | 1.8 | 0.9 |
| | Chlorides (mg/L) | 7 | | 3.0 | 6.0 | 4.8 | 4.5 | 0.1 |
| | **Biological** | | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | | 11.20 | 39.50 | 21.90 | 23.87 | 9.85 |
| | E. coli (MPN/DL)[J] | 4 | | 1 | 1 | 1 | 1 | 0 |
| **BANT-8** | **Physical** | | | | | | | |
| | Turbidity (NTU) | 7 | | 3.0 | 7.3 | 5.6 | 5.2 | 1.8 |
| | Total Dissolved Solids (mg/L) | 7 | | 154.0 | 475.0 | 363.0 | 359.6 | 101.6 |
| | Total Suspended Solids (mg/L) | 7 | | 2.0 | 16.0 | 7.0 | 8.1 | 5.0 |
| | Hardness (mg/L) | 4 | | 226.0 | 312.0 | 279.0 | 274.0 | 35.6 |
| | Alkalinity (mg/L) | 7 | | 72.5 | 141.0 | 125.0 | 117.5 | 22.4 |
| | Photic Zone (m) | 7 | | 1.58 | 4.13 | 2.33 | 2.32 | 0.88 |
| | Secchi (m) | 7 | | 0.72 | 2.50 | 1.33 | 1.51 | 0.65 |
| | Bottom Depth (m) | 7 | | 1.6 | 5.1 | 2.3 | 2.5 | 1.2 |
| | **Chemical** | | | | | | | |
| | Ammonia Nitrogen (mg/L)[J] | 7 | < | 0.015 | 0.021 | 0.010 | 0.010 | 0.003 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | | 1.010 | 2.300 | 1.240 | 1.504 | 0.540 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | | 0.370 | 1.910 | 0.977 | 1.087 | 0.582 |
| | Total Nitrogen (mg/L) | 7 | | 5.961 | 9.618 | 2.714 | 2.591 | 0.487 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | | 0.005 | 0.130 | 0.052 | 0.063 | 0.045 |
| | Total Phosphorus (mg/L) | 7 | | 0.043 | 0.175 | 0.062 | 0.096 | 0.056 |
| | CBOD-5 (mg/L) | 7 | < | 2.0 | 2.6 | 1.0 | 1.2 | 0.6 |
| | Chlorides (mg/L) | 7 | | 4.4 | 10.3 | 6.2 | 6.9 | 2.4 |
| | **Biological** | | | | | | | |
| | Chlorophyll a (mg/m³)[J] | 7 | | 1.42 | 53.40 | 4.27 | 14.95 | 19.87 |
| | E. coli (MPN/DL) | 5 | | 12 | 66 | 17 | 26 | 23 |

J=one or more of the values provided are estimated; < = Actual value is less than the detection limit.

Appendix Table 2. Summary of Bankhead Reservoir water quality data collected April-October 2021. Minimum (min) and maximum (max) values calculated using minimum detection limits when results were less than this value. Median (med), mean, and standard deviation (SD) values were calculated by multiplying the MDL by 0.5 when results were less than this value.

| Station | Parameter | N | Min | Max | Med | Avg | SD |
|---|---|---|---|---|---|---|---|
| **BANT-1** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 2.6 | 14.7 | 5.4 | 7.6 | 4.9 |
| | Total Dissolved Solids (mg/L)[J] | 7 | 74.0 | 140.0 | 105.0 | 104.0 | 24.4 |
| | Total Suspended Solids (mg/L)[J] | 7 | 2.0 | 13.0 | 5.0 | 6.4 | 3.8 |
| | Hardness (mg/L) | 4 | 69.9 | 93.1 | 81.0 | 81.2 | 9.6 |
| | Alkalinity (mg/L) | 7 | 28.3 | 54.3 | 46.6 | 43.1 | 10.2 |
| | Photic Zone (m) | 7 | 2.51 | 5.72 | 4.80 | 4.25 | 1.34 |
| | Secchi (m) | 7 | 0.87 | 1.90 | 1.20 | 1.25 | 0.34 |
| | Bottom Depth (m) | 7 | 18.4 | 19.3 | 18.8 | 18.8 | 0.3 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < 0.016 | 0.068 | 0.023 | 0.027 | 0.019 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.223 | 0.578 | 0.285 | 0.361 | 0.136 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | < 0.324 | 0.456 | 0.162 | 0.239 | 0.133 |
| | Total Nitrogen (mg/L) | 7 | < 1.155 | 3.102 | 0.571 | 0.600 | 0.222 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | < 0.004 | 0.012 | 0.005 | 0.006 | 0.004 |
| | Total Phosphorus (mg/L) | 7 | 0.021 | 0.041 | 0.028 | 0.029 | 0.006 |
| | CBOD-5 (mg/L) | 7 | < 2.0 | < 2.0 | 1.0 | 1.0 | 0.0 |
| | Chlorides (mg/L) | 7 | 2.3 | 4.2 | 3.5 | 3.3 | 0.8 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 7.56 | 21.40 | 11.70 | 13.18 | 5.38 |
| | E. coli (MPN/DL)[J] | 4 | 1 | 152 | 39 | 58 | 72 |
| **BANT-2** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 4.0 | 41.3 | 7.5 | 13.7 | 13.6 |
| | Total Dissolved Solids (mg/L)[J] | 7 | 72.0 | 155.0 | 108.0 | 110.6 | 29.4 |
| | Total Suspended Solids (mg/L)[J] | 7 | 4.0 | 24.0 | 7.0 | 10.0 | 7.1 |
| | Hardness (mg/L) | 4 | 62.7 | 101.0 | 85.1 | 83.5 | 18.6 |
| | Alkalinity (mg/L) | 7 | 27.7 | 59.3 | 39.3 | 43.6 | 11.0 |
| | Photic Zone (m) | 7 | 1.69 | 5.28 | 4.86 | 3.76 | 1.59 |
| | Secchi (m) | 7 | 0.42 | 1.65 | 1.23 | 1.08 | 0.42 |
| | Bottom Depth (m) | 7 | 11.6 | 13.6 | 12.2 | 12.3 | 0.7 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < 0.016 | 0.057 | 0.023 | 0.030 | 0.018 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.263 | 0.531 | 0.355 | 0.383 | 0.091 |
| | Total Kjeldahl Nitrogen (mg/L)[J] | 7 | < 0.324 | 0.504 | 0.162 | 0.267 | 0.139 |
| | Total Nitrogen (mg/L)[J] | 7 | < 1.491 | 2.301 | 0.682 | 0.650 | 0.092 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | < 0.004 | 0.016 | 0.005 | 0.007 | 0.005 |
| | Total Phosphorus (mg/L) | 7 | 0.020 | 0.051 | 0.027 | 0.031 | 0.011 |
| | CBOD-5 (mg/L) | 7 | < 2.0 | < 2.0 | 1.0 | 1.0 | 0.0 |
| | Chlorides (mg/L) | 7 | 2.2 | 4.7 | 2.8 | 3.1 | 1.0 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 2.14 | 19.60 | 11.90 | 11.43 | 5.25 |
| | E. coli (MPN/DL)[J] | 4 | 1 | 228 | 97 | 106 | 120 |

| Station | Parameter | N | Min | Max | Med | Avg | SD |
|---|---|---|---|---|---|---|---|
| **BANT-3** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 4.7 | 50.8 | 13.7 | 20.5 | 17.4 |
| | Total Dissolved Solids (mg/L)[J] | 7 | 87.0 | 277.0 | 175.0 | 168.4 | 62.0 |
| | Total Suspended Solids (mg/L)[J] | 7 | 4.0 | 56.0 | 9.0 | 19.9 | 18.6 |
| | Hardness (mg/L) | 5 | 60.4 | 173.0 | 92.0 | 106.5 | 43.9 |
| | Alkalinity (mg/L) | 7 | 38.7 | 81.0 | 60.8 | 60.2 | 16.4 |
| | Photic Zone (m) | 7 | 1.69 | 4.93 | 2.56 | 2.93 | 1.12 |
| | Secchi (m) | 7 | 0.32 | 1.25 | 0.78 | 0.84 | 0.33 |
| | Bottom Depth (m) | 7 | 5.3 | 7.2 | 6.3 | 6.2 | 0.6 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < 0.016 | 0.069 | 0.023 | 0.034 | 0.024 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.405 | 1.470 | 0.785 | 0.838 | 0.341 |
| | Total Kjeldahl Nitrogen (mg/L)[J] | 7 | < 0.324 | 0.656 | 0.350 | 0.343 | 0.192 |
| | Total Nitrogen (mg/L)[J] | 7 | < 1.701 | 5.460 | 1.157 | 1.181 | 0.408 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | < 0.004 | 0.035 | 0.006 | 0.015 | 0.013 |
| | Total Phosphorus (mg/L) | 7 | 0.019 | 0.080 | 0.036 | 0.039 | 0.022 |
| | CBOD-5 (mg/L) | 7 | < 2.0 | < 2.0 | 1.0 | 1.0 | 0.0 |
| | Chlorides (mg/L) | 7 | 2.1 | 7.3 | 4.2 | 4.3 | 1.8 |
| | **Total Metals** | | | | | | |
| | Aluminum (mg/L) | 1 | | | | 0.328 | |
| | Iron (mg/L) | 1 | | | | 0.472 | |
| | Manganese (mg/L)[J] | 1 | | | | 0.102 | |
| | **Dissolved Metals** | | | | | | |
| | Aluminum (mg/L)[J] | 1 | | | | 0.069 | |
| | Antimony (µg/L) | 1 | | | | 1.2 | |
| | Arsenic (µg/L) | 1 | | | | 0.9 | |
| | Cadmium (µg/L) | 1 | | | | 0.855 | |
| | Chromium (µg/L) | 1 | | | | 0.918 | |
| | Copper (µg/L) | 1 | | | | 1.060 | |
| | Iron (mg/L)[J] | 1 | | | | 0.088 | |
| | Lead (µg/L) | 1 | | | | 0.8 | |
| | Manganese (mg/L)[J] | 1 | | | | 0.036 | |
| | Nickel (µg/L) | 1 | | | | 2.280 | |
| | Selenium (µg/L) | 1 | | | | 1.8 | |
| | Silver (µg/L) | 1 | | | | 1.190 | |
| | Thallium (µg/L) | 1 | | | | 0.7 | |
| | Zinc (µg/L) | 1 | | | | 2.520 | |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 3.20 | 12.80 | 8.01 | 7.69 | 3.86 |
| | E. coli (MPN/DL)[J] | 7 | 3 | 214 | 17 | 61 | 79 |

| Station | Parameter | N | Min | Max | Med | Avg | SD |
|---|---|---|---|---|---|---|---|
| **BANT-4** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 5.5 | 40.2 | 9.7 | 14.0 | 12.2 |
| | Total Dissolved Solids (mg/L)[J] | 7 | 56.0 | 151.0 | 76.0 | 88.7 | 35.8 |
| | Total Suspended Solids (mg/L)[J] | 7 | 4.0 | 21.0 | 9.0 | 9.3 | 5.8 |
| | Hardness (mg/L) | 4 | 49.6 | 93.0 | 58.8 | 65.1 | 19.2 |
| | Alkalinity (mg/L) | 7 | 21.5 | 52.6 | 35.9 | 34.4 | 10.1 |
| | Photic Zone (m) | 7 | 1.71 | 5.08 | 3.52 | 3.41 | 1.23 |
| | Secchi (m) | 7 | 0.53 | 1.50 | 0.89 | 0.97 | 0.32 |
| | Bottom Depth (m) | 7 | 10.2 | 11.9 | 11.5 | 11.3 | 0.6 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L) | 7 | < 0.016 | 0.064 | 0.023 | 0.027 | 0.018 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.050 | 0.541 | 0.282 | 0.299 | 0.158 |
| | Total Kjeldahl Nitrogen (mg/L)[J] | 7 | < 0.324 | 0.700 | 0.162 | 0.312 | 0.214 |
| | Total Nitrogen (mg/L)[J] | 7 | < 1.116 | 3.378 | 0.444 | 0.610 | 0.288 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | < 0.004 | 0.015 | 0.004 | 0.006 | 0.005 |
| | Total Phosphorus (mg/L) | 7 | 0.017 | 0.055 | 0.026 | 0.028 | 0.013 |
| | CBOD-5 (mg/L) | 7 | < 2.0 | < 2.0 | 1.0 | 1.0 | 0.0 |
| | Chlorides (mg/L) | 7 | 1.8 | 2.8 | 2.4 | 2.4 | 0.4 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 5.34 | 32.00 | 9.61 | 13.35 | 9.88 |
| | E. coli (MPN/DL)[J] | 4 | 3 | 173 | 84 | 86 | 86 |
| **BANT-5** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 5.2 | 35.4 | 7.8 | 14.6 | 12.0 |
| | Total Dissolved Solids (mg/L)[J] | 7 | 205.0 | 748.0 | 266.0 | 332.4 | 189.3 |
| | Total Suspended Solids (mg/L)[J] | 7 | < 1.0 | 20.0 | 8.0 | 9.9 | 6.6 |
| | Hardness (mg/L) | 4 | 132.0 | 369.0 | 158.5 | 204.5 | 110.5 |
| | Alkalinity (mg/L) | 7 | 63.2 | 200.0 | 89.4 | 101.0 | 46.2 |
| | Photic Zone (m) | 7 | 1.67 | 4.80 | 3.72 | 3.50 | 1.24 |
| | Secchi (m) | 7 | 0.42 | 1.45 | 1.06 | 0.96 | 0.36 |
| | Bottom Depth (m) | 7 | 11.2 | 13.8 | 13.0 | 12.9 | 1.0 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L)[J] | 7 | < 0.016 | 0.047 | 0.023 | 0.024 | 0.011 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.101 | 0.254 | 0.217 | 0.188 | 0.059 |
| | Total Kjeldahl Nitrogen (mg/L)[J] | 7 | < 0.324 | 0.536 | 0.162 | 0.215 | 0.141 |
| | Total Nitrogen (mg/L)[J] | 7 | < 0.789 | 1.983 | 0.389 | 0.403 | 0.125 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | < 0.004 | 0.010 | 0.005 | 0.005 | 0.003 |
| | Total Phosphorus (mg/L) | 7 | 0.011 | 0.025 | 0.020 | 0.018 | 0.005 |
| | CBOD-5 (mg/L) | 7 | < 2.0 | < 2.0 | 1.0 | 1.0 | 0.0 |
| | Chlorides (mg/L) | 7 | 1.4 | 2.7 | 1.7 | 1.8 | 0.4 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 1.07 | 9.61 | 7.48 | 5.89 | 3.04 |
| | E. coli (MPN/DL)[J] | 4 | 6 | 387 | 94 | 145 | 170 |

| Station | Parameter | N | Min | Max | Med | Avg | SD |
|---|---|---|---|---|---|---|---|
| **BANT-6** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 5.6 | 37.3 | 6.4 | 13.8 | 11.8 |
| | Total Dissolved Solids (mg/L)[J] | 7 | 123.0 | 334.0 | 280.0 | 242.4 | 84.9 |
| | Total Suspended Solids (mg/L)[J] | 7 | 4.0 | 19.0 | 7.0 | 9.0 | 5.2 |
| | Hardness (mg/L) | 4 | 86.7 | 170.0 | 108.0 | 118.2 | 36.1 |
| | Alkalinity (mg/L) | 7 | 60.2 | 152.0 | 113.0 | 102.3 | 35.1 |
| | Photic Zone (m) | 7 | 1.30 | 4.16 | 3.73 | 3.32 | 1.05 |
| | Secchi (m) | 7 | 0.37 | 2.02 | 0.94 | 1.04 | 0.50 |
| | Bottom Depth (m) | 7 | 7.7 | 9.3 | 8.5 | 8.4 | 0.5 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L)[J] | 7 | < 0.024 | 0.076 | 0.023 | 0.031 | 0.020 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.623 | 2.720 | 1.870 | 1.652 | 0.797 |
| | Total Kjeldahl Nitrogen (mg/L)[J] | 7 | < 0.324 | 0.466 | 0.162 | 0.263 | 0.130 |
| | Total Nitrogen (mg/L)[J] | 7 | < 2.355 | 9.231 | 2.032 | 1.915 | 0.779 |
| | Dis Reactive Phosphorus (mg/L) | 7 | 0.039 | 0.140 | 0.082 | 0.090 | 0.035 |
| | Total Phosphorus (mg/L) | 7 | 0.059 | 0.177 | 0.108 | 0.117 | 0.040 |
| | CBOD-5 (mg/L) | 7 | < 2.0 | 2.3 | 1.0 | 1.2 | 0.5 |
| | Chlorides (mg/L) | 7 | 3.5 | 13.8 | 8.9 | 8.3 | 3.9 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 1.07 | 34.70 | 5.87 | 10.02 | 11.76 |
| | E. coli (MPN/DL)[J] | 4 | 2 | 816 | 90 | 250 | 381 |
| **BANT-7** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 2.3 | 12.6 | 5.6 | 6.0 | 3.3 |
| | Total Dissolved Solids (mg/L)[J] | 7 | 49.0 | 135.0 | 82.0 | 88.0 | 32.3 |
| | Total Suspended Solids (mg/L)[J] | 7 | 3.0 | 9.0 | 4.0 | 4.6 | 2.2 |
| | Hardness (mg/L) | 4 | 45.5 | 81.0 | 65.4 | 64.3 | 15.0 |
| | Alkalinity (mg/L) | 7 | 22.3 | 46.4 | 33.0 | 35.2 | 9.6 |
| | Photic Zone (m) | 7 | 2.48 | 8.00 | 3.83 | 4.79 | 2.23 |
| | Secchi (m) | 7 | 0.98 | 2.00 | 1.59 | 1.56 | 0.35 |
| | Bottom Depth (m) | 7 | 13.1 | 18.2 | 17.9 | 16.8 | 2.0 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L)[J] | 7 | < 0.016 | 0.051 | 0.023 | 0.025 | 0.013 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 0.092 | 0.409 | 0.208 | 0.240 | 0.110 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | < 0.324 | 0.464 | 0.162 | 0.244 | 0.140 |
| | Total Nitrogen (mg/L) | 7 | < 0.762 | 2.520 | 0.409 | 0.483 | 0.206 |
| | Dis Reactive Phosphorus (mg/L)[J] | 7 | < 0.004 | 0.008 | 0.004 | 0.004 | 0.002 |
| | Total Phosphorus (mg/L) | 7 | 0.014 | 0.040 | 0.025 | 0.026 | 0.010 |
| | CBOD-5 (mg/L) | 7 | < 2.0 < | 2.0 | 1.0 | 1.0 | 0.0 |
| | Chlorides (mg/L) | 7 | 2.4 | 3.9 | 3.4 | 3.2 | 0.5 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | 7.56 | 19.80 | 13.40 | 13.59 | 4.33 |
| | E. coli (MPN/DL)[J] | 4 | 1 | 37 | 7 | 13 | 17 |

| Station | Parameter | N | Min | Max | Med | Avg | SD |
|---|---|---|---|---|---|---|---|
| **BANT-8** | **Physical** | | | | | | |
| | Turbidity (NTU) | 7 | 1.7 | 14.4 | 4.5 | 5.9 | 4.6 |
| | Total Dissolved Solids (mg/L) | 7 | 281.0 | 460.0 | 370.0 | 373.9 | 64.5 |
| | Total Suspended Solids (mg/L)[J] | 7 | 1.0 | 16.0 | 8.0 | 7.9 | 5.6 |
| | Hardness (mg/L) | 4 | 142.0 | 262.0 | 210.0 | 206.0 | 51.6 |
| | Alkalinity (mg/L)[J] | 7 | 78.9 | 129.0 | 102.0 | 102.9 | 15.9 |
| | Photic Zone (m) | 7 | 1.96 | 2.20 | 2.09 | 2.10 | 0.08 |
| | Secchi (m) | 7 | 0.70 | 2.20 | 1.81 | 1.54 | 0.67 |
| | Bottom Depth (m) | 7 | 2.0 | 2.5 | 2.1 | 2.2 | 0.2 |
| | **Chemical** | | | | | | |
| | Ammonia Nitrogen (mg/L)[J] | 7 | < 0.015 | 0.522 | 0.008 | 0.081 | 0.194 |
| | Nitrate+Nitrite Nitrogen (mg/L) | 7 | 1.390 | 4.290 | 2.070 | 2.687 | 1.123 |
| | Total Kjeldahl Nitrogen (mg/L) | 7 | 0.127 | 1.010 | 0.641 | 0.576 | 0.288 |
| | Total Nitrogen (mg/L) | 7 | 5.433 | 15.231 | 3.080 | 3.263 | 1.240 |
| | Dis Reactive Phosphorus (mg/L) | 7 | 0.014 | 0.076 | 0.044 | 0.045 | 0.023 |
| | Total Phosphorus (mg/L) | 7 | 0.029 | 0.106 | 0.076 | 0.073 | 0.028 |
| | CBOD-5 (mg/L) | 7 | < 2.0 | < 2.0 | 1.0 | 1.0 | 0.0 |
| | Chlorides (mg/L) | 7 | 3.3 | 9.3 | 7.7 | 7.0 | 2.1 |
| | **Biological** | | | | | | |
| | Chlorophyll a (mg/m³) | 7 | < 1.00 | 4.22 | 3.20 | 2.42 | 1.54 |
| | E. coli (MPN/DL) | 4 | 57 | 214 | 77 | 105 | 72 |

J=one or more of the values provided are estimated; < = Actual value is less than the detection limit.