Prepared in cooperation with the
CITY OF DALLAS



# PHYSICAL AND CHEMICAL DATA

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Data collected in each of the low-flow and high-flow surveys are presented in tables 2 and 3, respectively. Unit discharge in cubic feet per second per square mile, concentrations of total nitrogen and total phosphorus in milligrams per liter (mg/L), and instantaneous yields of nitrogen and phosphorus in pounds per day per square mile are shown graphically in figures 4, 5, and 6, respectively. In these figures, data for each constituent during the surveys were ranked from smallest to largest value. Following the ranking, each data value was assigned a rank value, with the smallest receiving a rank value of 1, and the largest assigned a rank value of 29 (there were 29 observations in most cases). The darkened parts of the square associated with each site represents the rank value at that site. The square is completely darkened for the site with the largest value, and is blank for the site with the smallest value. Frequency histograms of each of the data sets are also presented to show the general distribution and central tendency of the actual data values.

## REFERENCES

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Skougstad, M.W., Fishman, M.J., Friedman, L.C., Erdmann, D.E., and Duncan, S.S., 1979, Methods for determination of inorganic substances in water and fluvial sediments: U.S. Geological Survey Techniques Water-Resources Investigations, book 5, chap., A1, 626 p.

Table 2.-- Physical and chemical data collected in the low-flow synoptic survey, March 21, 1984

[$ft^3/s$, cubic feet per second; µS/cm, microsiemens per centimeterat 25° C; °C, degrees Celsius; mg/L, milligrams per liter]

| Watershed | Site identification | Discharge ($ft^3/s$) | Specific conductance (µS/cm) | pH (units) | Temperature (°C) | Dissolved oxygen (mg/L) | Nitrite plus nitrate nitrogen (mg/L) | Ammonium plus organic nitrogen (mg/L) | Total nitrogen (mg/L) | Total phosphorus (mg/L) | Total organic carbon (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hickory Creek | H1 | 6.6 | 378 | 7.9 | 17.0 | 8.8 | 1.4 | 2.0 | 3.4 | 0.30 | 8.5 |
| | H2 | 8.1 | 375 | 7.8 | 13.5 | 8.1 | 1.5 | 6.5 | 8.0 | .23 | 11.0 |
| | H3 | .3 | 318 | 7.8 | 17.0 | 6.0 | 1.7 | .8 | 2.5 | .20 | 10.0 |
| | H4 | 24.0 | 342 | 7.7 | 16.0 | 8.8 | 1.0 | 3.8 | 4.8 | .18 | 10.0 |
| | H5 | .1 | 490 | 7.7 | 19.0 | 5.9 | .1 | .5 | .6 | .04 | 7.8 |
| Clear Creek | C1 | 47.0 | 574 | 8.8 | 16.0 | 10.2 | .1 | .4 | .5 | .02 | 12.0 |
| | C2 | 4.2 | 408 | 7.6 | 15.0 | 9.7 | .6 | 1.0 | 1.6 | .04 | 6.7 |
| | C3 | 63.0 | 533 | 8.2 | 11.0 | 8.1 | .1 | .5 | .6 | .03 | 5.2 |
| | C4 | 66.0 | 511 | 8.3 | 12.0 | 8.1 | .2 | .6 | .8 | .07 | 4.8 |
| | C5 | 2.2 | 292 | 8.0 | 13.0 | 6.5 | .4 | 1.2 | 1.6 | .09 | 8.0 |
| Elm Fork Trinity River | E1 | 58.4 | 669 | 8.1 | 13.0 | 10.8 | .7 | 1.0 | 1.7 | .25 | 8.9 |
| | E2 | 66.0 | 704 | 8.1 | 14.0 | 9.3 | 1.0 | 1.1 | 2.1 | .28 | 8.3 |
| | E3 | 5.7 | 551 | 8.0 | 15.0 | 10.8 | 1.2 | .9 | 2.1 | .10 | 6.2 |
| | E4 | 69.0 | 667 | 8.1 | 14.0 | 9.9 | .8 | .7 | 1.5 | .16 | 7.6 |
| Isle du Bois Creek | I1 | 6.1 | 290 | 7.7 | 11.0 | 9.0 | .3 | 2.5 | 2.8 | .07 | 12.0 |
| | I2 | 50.6 | 214 | 7.4 | 11.0 | 10.2 | .8 | 2.5 | 3.3 | .08 | 17.0 |
| | I3 | 54.0 | 221 | 7.3 | 12.5 | 9.5 | .8 | 2.0 | 2.8 | .50 | 15.0 |
| Little Elm Creek | L1 | 9.4 | 421 | 8.0 | 11.5 | 9.4 | 2.2 | 3.5 | 5.7 | .45 | 14.0 |
| | L2 | 14.0 | 430 | 7.6 | 16.5 | 9.4 | 1.9 | 2.5 | 4.4 | .08 | 13.0 |
| | L3 | 2.8 | 376 | 7.3 | 12.5 | 8.2 | 1.3 | 3.0 | 4.3 | .06 | 17.0 |
| | L4 | 2.7 | 290 | 7.3 | 11.0 | 9.4 | .5 | 2.0 | 2.5 | .07 | 15.0 |
| | L5 | 1.2 | 173 | 7.1 | 10.5 | 9.3 | .6 | .6 | 1.2 | .05 | 7.1 |
| Cooper Creek | O1 | .7 | 563 | 7.8 | 12.0 | 10.7 | .2 | .9 | 1.1 | .05 | 7.4 |
| Alyne Branch | O2 | .1 | 215 | 7.5 | 8.0 | 10.5 | .1 | 1.4 | 1.5 | .36 | 17.0 |
| Pecan Creek | O3 | 1.7 | 736 | 7.8 | 12.5 | 9.2 | .1 | .7 | .8 | .19 | 7.9 |
| Button Branch | O4 | 2.2 | 644 | 8.0 | 16.0 | 9.2 | 5.3 | 1.5 | 6.8 | .63 | 6.1 |
| Panther Creek | O5 | 8.7 | 596 | 8.1 | 16.0 | 9.6 | 1.1 | 1.2 | 2.3 | .05 | 4.9 |
| Cottonwood Branch | O6 | 3.0 | 786 | 7.9 | 14.0 | 8.8 | 4.0 | 1.8 | 5.8 | .34 | 6.8 |
| Stewart Creek | O7 | 7.6 | 1,160 | 8.0 | 14.0 | 10.6 | 2.7 | 5.2 | 7.9 | .24 | 4.8 |


Figure 4.--Unit-discharge rankings, unit discharges and frequency histograms for low- and high-flow synoptic surveys.

Table 3.-- Physical and chemical data collected in the high-flow synoptic survey, March 25, 1985

[$ft^3/s$, cubic feet per second; µS/cm, microsiemens per centimeter at 25° C; °C, degrees Celsius; mg/L, milligrams per liter]

| Watershed | Site identification | Discharge ($ft^3/s$) | Specific conductance (µS/cm) | pH (units) | Temperature (°C) | Dissolved oxygen (mg/L) | Nitrite plus nitrate nitrogen (mg/L) | Ammonium plus organic nitrogen (mg/L) | Total nitrogen (mg/L) | Total phosphorus (mg/L) | Total organic carbon (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hickory Creek | H1 | 7.6 | 483 | 7.9 | 17.0 | 9.6 | 2.2 | 1.0 | 3.2 | 0.15 | 5.5 |
| | H2 | 3.9 | 505 | 7.7 | 15.5 | 8.8 | 2.7 | 1.3 | 4.0 | .13 | 4.9 |
| | H3 | 1.1 | 359 | 7.6 | 17.5 | 6.6 | .9 | 1.2 | 2.1 | .12 | 11.0 |
| | H4 | 33.0 | 461 | 8.0 | 17.0 | 8.5 | 1.7 | .9 | 2.6 | .11 | 6.5 |
| | H5 | .5 | 502 | 8.0 | 14.5 | 8.2 | .1 | .5 | .6 | .04 | 6.1 |
| Clear Creek | C1 | 180.0 | 483 | 8.2 | 19.0 | 8.6 | .3 | .9 | 1.2 | .07 | 4.7 |
| | C2 | 14.0 | 391 | 7.9 | 19.0 | 8.9 | 1.4 | .4 | 1.8 | .06 | 5.7 |
| | C3 | 296.0 | 453 | 8.1 | 17.0 | 9.0 | .5 | 1.0 | 1.5 | .09 | 5.6 |
| | C4 | 325.0 | 451 | 8.1 | 17.5 | 8.8 | .5 | .9 | 1.4 | .10 | 6.1 |
| | C5 | 1.7 | ~414 | 8.2 | 20.0 | 9.7 | .2 | .8 | 1.0 | .04 | 6.4 |
| Elm Fork Trinity River | E1 | 277.0 | 514 | 8.0 | 17.5 | 9.4 | .9 | 1.4 | 2.3 | .18 | -- |
| | E2 | 360.0 | 511 | 8.1 | 17.5 | 9.3 | .9 | 1.0 | 1.9 | .16 | 6.7 |
| | E3 | 24.0 | 586 | 7.9 | 18.5 | 9.2 | 2.4 | 1.2 | 3.6 | .10 | 5.0 |
| | E4 | 390.0 | 501 | 7.9 | 16.0 | 8.2 | 1.0 | 1.2 | 2.2 | .10 | 6.1 |
| Isle du Bois Creek | I1 | 22.0 | 609 | 7.3 | 17.3 | 8.3 | .2 | .9 | 1.1 | .13 | -- |
| | I2 | 46.0 | 467 | 7.4 | 16.5 | 8.6 | .4 | .9 | 1.3 | .16 | 6.0 |
| | I3 | 101.0 | 425 | 7.8 | 17.5 | 7.5 | .3 | 1.2 | 1.5 | .13 | 8.4 |
| Little Elm Creek | L1 | 84.9 | 275 | 7.8 | 16.5 | 8.5 | 2.0 | 1.6 | 3.6 | .33 | 10.0 |
| | L2 | 72.5 | 292 | 8.1 | 17.0 | 8.9 | 2.0 | 2.9 | 4.9 | .41 | 14.0 |
| | L3 | 1.3 | 390 | 7.6 | 17.3 | 8.1 | 1.0 | 1.3 | 2.3 | .16 | 8.0 |
| | L4 | 6.2 | 737 | 7.3 | 18.0 | 8.8 | .3 | .9 | 1.2 | .16 | 6.9 |
| | L5 | 1.3 | 163 | 7.4 | 15.0 | 10.0 | .5 | .6 | 1.1 | .10 | 4.8 |
| Cooper Creek | O1 | 1.0 | 957 | 8.0 | 20.0 | 10.2 | .5 | 1.0 | 1.5 | .01 | 2.6 |
| Alyne Branch | O2 | .4 | 629 | 8.3 | 26.0 | 10.3 | .1 | .7 | .8 | .10 | 9.0 |
| Pecan Creek | O3 | 1.9 | 1,130 | 7.9 | 18.2 | 8.9 | .6 | .5 | 1.1 | .10 | 4.9 |
| Button Branch | O4 | 5.7 | 622 | 8.0 | 20.5 | 8.7 | 1.1 | 1.1 | 2.2 | .29 | 6.2 |
| Panther Creek | O5 | 9.8 | 603 | 8.0 | 20.0 | 9.3 | 1.6 | .7 | 2.3 | .05 | 3.8 |
| Cottonwood Branch | O6 | 1.6 | 831 | 8.0 | 22.0 | 10.0 | 4.9 | 1.3 | 6.2 | .16 | 4.6 |
| Stewart Creek | O7 | 6.7 | 791 | 7.5 | 17.0 | 8.8 | 4.8 | 11.0 | 15.8 | .41 | 3.0 |

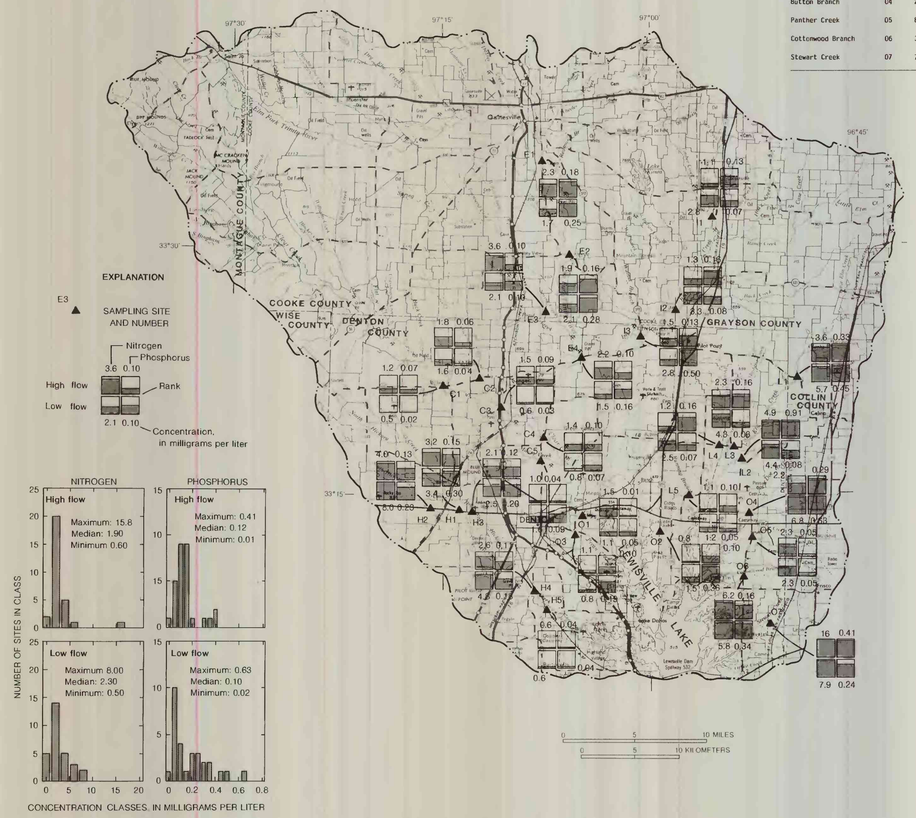


Figure 5.--Nitrogen and phosphorus concentration rankings, concentration data, and frequency histograms for low- and high-flow synoptic surveys.

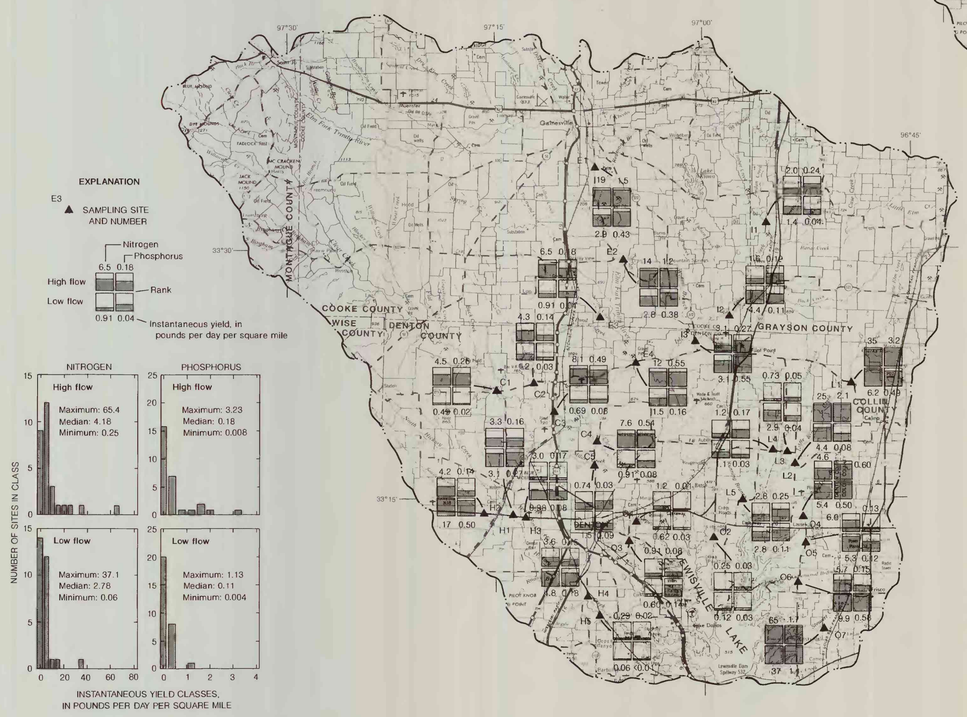


Figure 6.--Nitrogen and phosphorus yield rankings, yields, and frequency histograms for low- and high-flow synoptic surveys.

# PHYSICAL AND CHEMICAL DATA FROM TWO WATER-QUALITY SURVEYS OF STREAMS IN THE LEWISVILLE LAKE WATERSHED, NORTH-CENTRAL TEXAS, 1984 AND 1985

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