


JORDAN LAKE ANNUAL REPORT 2024

**NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES
WATER SCIENCES SECTION**

THIS REPORT HAS BEEN APPROVED FOR RELEASE



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Study for the Ongoing Assessment of Water Quality in B. Everett Jordan Lake: 2024 Results

Purpose:

The objective of this study is to evaluate progress in reducing nutrient and nutrient-related pollution in B. Everett Jordan Lake (WS-IV, B; NSW, CA), as required by the Jordan Lake water supply nutrient strategy (15A NCAC 02B.0262) (i.e., the “Jordan Lake Rules”). This report summarizes the results of samples collected in 2024.

Methods:

[Study Plan for the Ongoing Assessment of Water Quality in Jordan Lake](#)

A total of nine monitoring stations (Figure 1) representing the three lake management sections - Upper New Hope (Figure 2), Lower New Hope (Figure 3), and The Haw River Arm (Figure 4) - were sampled in Jordan Lake during 2024. All samples were collected following the Intensive Survey Branch's Standard Operating Procedures Manual: [Physical and Chemical Monitoring v2.1, Dec. 2013 and Ambient Lakes Quality Assurance Project Plan v2.0, March 2014](#). Stations were sampled monthly. Chemical samples were collected as composites from the photic zone and analyzed for Total Phosphorus (TP), Total Nitrogen (TN), Ammonia (NH₃), Nitrate + Nitrite (NO₃+NO₂), Total Kjeldahl Nitrogen (TKN), Turbidity, and Chlorophyll a (chl-a). Duplicate samples were collected at one station per sampling event on a rotating schedule for quality control. Physical measurements of Dissolved Oxygen (DO), Temperature, pH, and Conductivity were taken through the water column at one-meter intervals using a multi-parameter sonde. Surface readings (0.15m) for physical parameters were used in data analysis.

Results:

One-year summary results are presented by station for the three management areas: Upper New Hope (Figure 2), Lower New Hope (Figure 3), Haw River Arm (Figure 4) and the entirety of the management areas (Figure 5). The tables display annual mean, minimum, and maximum concentrations for TP (mg/L), TN (mg/L), chl-a (µg/L), Turbidity (NTU), DO (mg/L), and pH (s.u.). Data summaries are calculated from twelve sampling events (n=12) for all sites unless noted otherwise due to sample exclusions based on questionable analytical results. This is reflected by the adjusted sample size for chl-a (n=10 at CPF055C, n=9 at CPF055D, n=8 at CPF055E, CPF081A1C, CPF086C, CPF086F, CPF087B3, CPF087D, n=7 at CPF0880A), DO and pH (n=11 at CPF086C). Percent exceedance of state fresh surface water quality standards is shown for each station, where exceedance is defined as chl-a >40 µg/L; Turbidity >25 NTU; DO <4 mg/L; pH >9 or <6 s.u. All Nitrate + Nitrite data below the analytical detection limit (< 0.02 mg/L) were normalized to 0.01 mg/L to calculate TN values. Results for additional parameters not included here are available upon request. Please direct any questions or comments to the Intensive Survey Branch Supervisor, Jeff DeBerardinis at jeff.deberardinis@deq.nc.gov.

Jordan lake Monitoring Stations

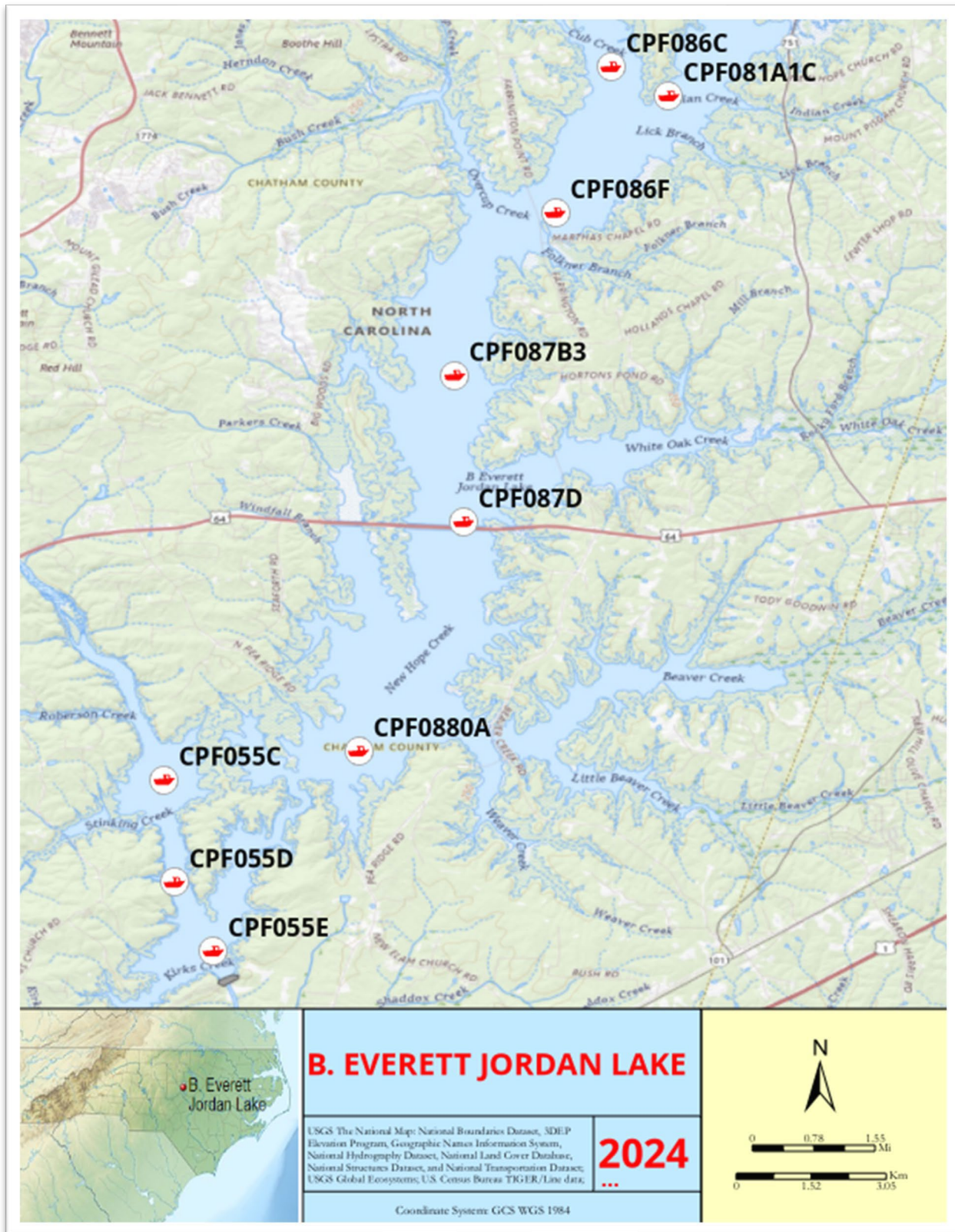


Figure 1. B. Everett Jordan Lake monitoring stations.

Upper New Hope Section Results

| CPF086C | | | | | | | |
|------------------------|------|------|--------|-----------|-------|-------|--|
| | TP | TN | Chl a | Turbidity | DO | pH | |
| n | 12 | 12 | 8 | 12 | 11 | 11 | |
| Mean | 0.06 | 1.01 | 48.26 | 13.93 | 9.88 | 7.37 | |
| Min | 0.03 | 0.84 | 27.00 | 6.90 | 5.70 | 6.40 | |
| Max | 0.09 | 1.24 | 69.60 | 35.00 | 11.60 | 8.30 | |
| n > Standard | | | 5 | 1 | 0 | 0 | |
| % Exceedance | | | 62.50% | 8.33% | 0.00% | 0.00% | |
| % Confidence | | | 99.96% | 28.24% | N/A | N/A | |

| CPF081A1C | | | | | | | |
|------------------------|------|------|--------|-----------|-------|-------|--|
| | TP | TN | Chl a | Turbidity | DO | pH | |
| n | 12 | 12 | 8 | 12 | 12 | 12 | |
| Mean | 0.06 | 1.00 | 38.65 | 16.69 | 9.64 | 7.19 | |
| Min | 0.03 | 0.78 | 26.00 | 6.80 | 5.50 | 6.20 | |
| Max | 0.03 | 1.42 | 58.00 | 45.00 | 12.10 | 8.00 | |
| n > Standard | | | 3 | 2 | 0 | 0 | |
| % Exceedance | | | 37.50% | 16.67% | 0.00% | 0.00% | |
| % Confidence | | | 96.19% | 65.90% | N/A | N/A | |

| CPF086F | | | | | | | |
|------------------------|------|------|--------|-----------|-------|-------|--|
| | TP | TN | Chl a | Turbidity | DO | pH | |
| n | 12 | 12 | 8 | 12 | 12 | 12 | |
| Mean | 0.05 | 0.98 | 39.76 | 11.58 | 9.70 | 7.19 | |
| Min | 0.03 | 0.75 | 28.00 | 5.60 | 6.80 | 6.30 | |
| Max | 0.08 | 1.33 | 64.00 | 33.00 | 12.60 | 8.60 | |
| n > Standard | | | 4 | 1 | 0 | 0 | |
| % Exceedance | | | 50.00% | 8.33% | 0.00% | 0.00% | |
| % Confidence | | | 99.50% | 28.24% | N/A | N/A | |

Key for Tables:

n: Number of sampling events

n>standard: Number of times the sample exceeds water quality standards:

Chl-a > 40 µg/L

Turbidity > 25 NTU

DO < 4 mg/L

pH > 9 or < 6 s.u.

% Exceedance: Percentage of samples that exceeded water quality standards

% Confidence: Indicates the statistical confidence level that the actual percentage of exceedances is greater than 10%. Low confidence percentages result from a small sample size or exceedance rate less than 10%.



Figure 2. Upper New Hope section

Lower New Hope Sections Results

| CPF087B3 | | | | | | | |
|------------------------|------|------|--------|-----------|-------|--------|--|
| | TP | TN | Chl a | Turbidity | DO | pH | |
| n | 12 | 12 | 8 | 12 | 12 | 12 | |
| Mean | 0.04 | 0.86 | 37.64 | 7.80 | 9.43 | 6.88 | |
| Min | 0.03 | 0.70 | 29.10 | 4.00 | 5.90 | 5.90 | |
| Max | 0.06 | 1.03 | 51.00 | 15.00 | 15.00 | 8.40 | |
| n > Standard | | | 2 | 0 | 0 | 1 | |
| % Exceedance | | | 25.00% | 0.00% | 0.00% | 8.33% | |
| % Confidence | | | 81.31% | N/A | N/A | 28.24% | |

| CPF087D | | | | | | | |
|------------------------|------|------|--------|-----------|-------|--------|--|
| | TP | TN | Chl a | Turbidity | DO | pH | |
| n | 12 | 12 | 8 | 12 | 12 | 12 | |
| Mean | 0.04 | 0.88 | 33.51 | 7.25 | 9.63 | 6.53 | |
| Min | 0.03 | 0.55 | 13.60 | 4.20 | 7.00 | 5.10 | |
| Max | 0.06 | 1.30 | 56.00 | 14.00 | 11.00 | 8.60 | |
| n > Standard | | | 2 | 0 | 0 | 5 | |
| % Exceedance | | | 25.00% | 0.00% | 0.00% | 41.67% | |
| % Confidence | | | 81.31% | N/A | N/A | 99.57% | |

| CPF0880A | | | | | | | |
|------------------------|------|------|--------|-----------|-------|-------|--|
| | TP | TN | Chl a | Turbidity | DO | pH | |
| n | 12 | 12 | 7 | 12 | 12 | 12 | |
| Mean | 0.05 | 0.86 | 33.34 | 10.64 | 9.46 | 7.49 | |
| Min | 0.03 | 0.63 | 18.00 | 4.20 | 6.80 | 6.40 | |
| Max | 0.10 | 1.15 | 57.00 | 50.00 | 13.10 | 8.70 | |
| n > Standard | | | 2 | 1 | 0 | 0 | |
| % Exceedance | | | 28.57% | 8.33% | 0.00% | 0.00% | |
| % Confidence | | | 85.03% | 28.24% | N/A | N/A | |

Key for Tables:

n: Number of sampling events

n>standard: Number of times the sample exceeds water quality standards:

Chl-a > 40 µg/L

Turbidity > 25 NTU

DO < 4 mg/L

pH > 9 or < 6 s.u.

% Exceedance: Percentage of samples that exceeded water quality standards

% Confidence: Indicates the statistical confidence level that the actual percentage of exceedances is greater than 10%. Low confidence percentages result from a small sample size or exceedance rate less than 10%.



Figure 3. Lower New Hope Section

Haw River Arm Section Results

| CPF055C | | | | | | | |
|------------------------|--|------|------|--------|-----------|-------|-------|
| | | TP | TN | Chl a | Turbidity | DO | pH |
| n | | 12 | 12 | 10 | 12 | 12 | 12 |
| Mean | | 0.08 | 0.95 | 41.61 | 26.21 | 9.82 | 7.55 |
| Min | | 0.04 | 0.73 | 7.00 | 5.20 | 5.80 | 6.90 |
| Max | | 0.17 | 1.15 | 101.00 | 85.00 | 11.30 | 8.50 |
| n > Standard | | | | 5 | 4 | 0 | 0 |
| % Exceedance | | | | 50.00% | 33.33% | 0.00% | 0.00% |
| % Confidence | | | | 99.84% | 97.44% | N/A | N/A |

| CPF055D | | | | | | | |
|------------------------|--|------|------|--------|-----------|-------|-------|
| | | TP | TN | Chl a | Turbidity | DO | pH |
| n | | 12 | 12 | 9 | 12 | 12 | 12 |
| Mean | | 0.07 | 0.91 | 26.17 | 18.93 | 9.45 | 7.39 |
| Min | | 0.03 | 0.63 | 8.80 | 4.40 | 6.30 | 6.80 |
| Max | | 0.19 | 1.16 | 56.00 | 90.00 | 11.80 | 8.80 |
| n > Standard | | | | 2 | 3 | 0 | 0 |
| % Exceedance | | | | 22.22% | 25.00% | 0.00% | 0.00% |
| % Confidence | | | | 77.48% | 88.91% | N/A | N/A |

| CPF055E | | | | | | | |
|------------------------|--|------|------|--------|-----------|-------|-------|
| | | TP | TN | Chl a | Turbidity | DO | pH |
| n | | 12 | 12 | 8 | 12 | 12 | 12 |
| Mean | | 0.05 | 0.88 | 31.10 | 16.45 | 9.54 | 7.52 |
| Min | | 0.03 | 0.63 | 6.70 | 4.10 | 6.30 | 6.70 |
| Max | | 0.11 | 1.37 | 71.00 | 95.00 | 11.10 | 8.40 |
| n > Standard | | | | 1 | 1 | 0 | 0 |
| % Exceedance | | | | 12.50% | 8.33% | 0.00% | 0.00% |
| % Confidence | | | | 43.04% | 28.24% | N/A | N/A |

Key for Tables:

n: Number of sampling events

n>standard: Number of times the sample exceeds water quality standards:

Chl-a > 40 µg/L

Turbidity > 25 NTU

DO < 4 mg/L

pH > 9 or < 6 s.u.

% Exceedance: Percentage of samples that exceeded water quality standards

% Confidence: Indicates the statistical confidence level that the actual percentage of exceedances is greater than 10%. Low confidence percentages result from a small sample size or exceedance rate less than 10%.



Figure 4. Haw River Arm

Jordan Lake 2024 Results

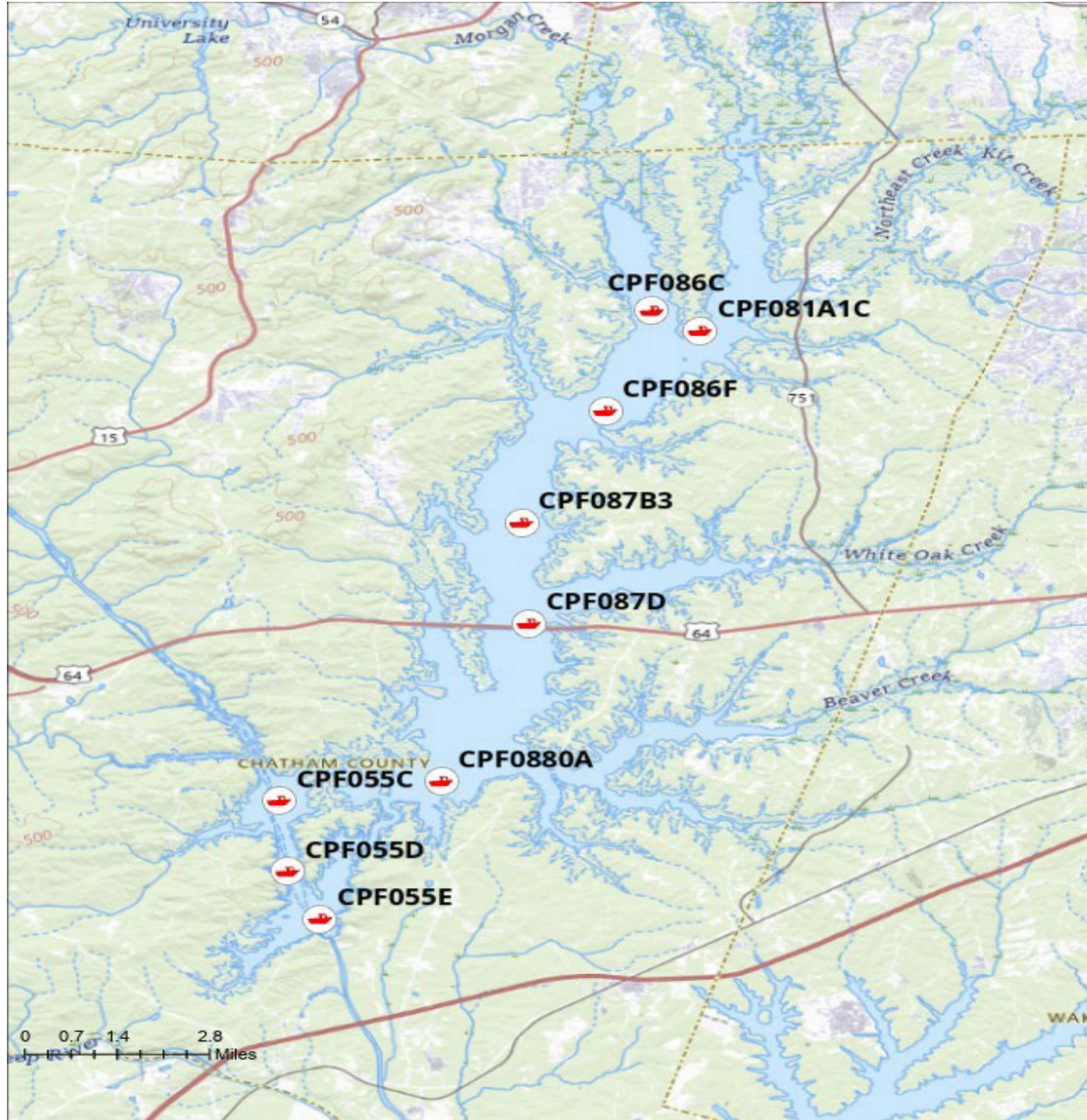


Figure 5. Entirety of the management areas

| JORDAN LAKE | | | | | | | |
|------------------------|--|-------------|-------------|----------------|---------------|--------------|--------------|
| | | TP | TN | Chl a | Turbidity | DO | pH |
| n | | 108 | 108 | 74 | 108 | 107 | 107 |
| Mean | | 0.06 | 0.93 | 36.71 | 14.39 | 9.61 | 7.23 |
| Min | | 0.03 | 0.55 | 6.70 | 4.00 | 5.50 | 5.10 |
| Max | | 0.19 | 1.42 | 101.00 | 95.00 | 13.10 | 8.80 |
| n > Standard | | | | 26 | 13 | 0 | 6 |
| % Exceedance | | | | 35.14% | 12.04% | 0.00% | 5.61% |
| % Confidence | | | | 100.00% | 71.73% | N/A | 3.74% |