JORDAN LAKE ANNUAL REPORT 2024

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

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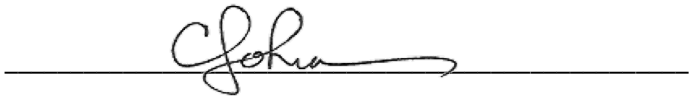

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Study for the Ongoing Assessment of Water Quality in B. Everett Jordan Lake: 2024 Results

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

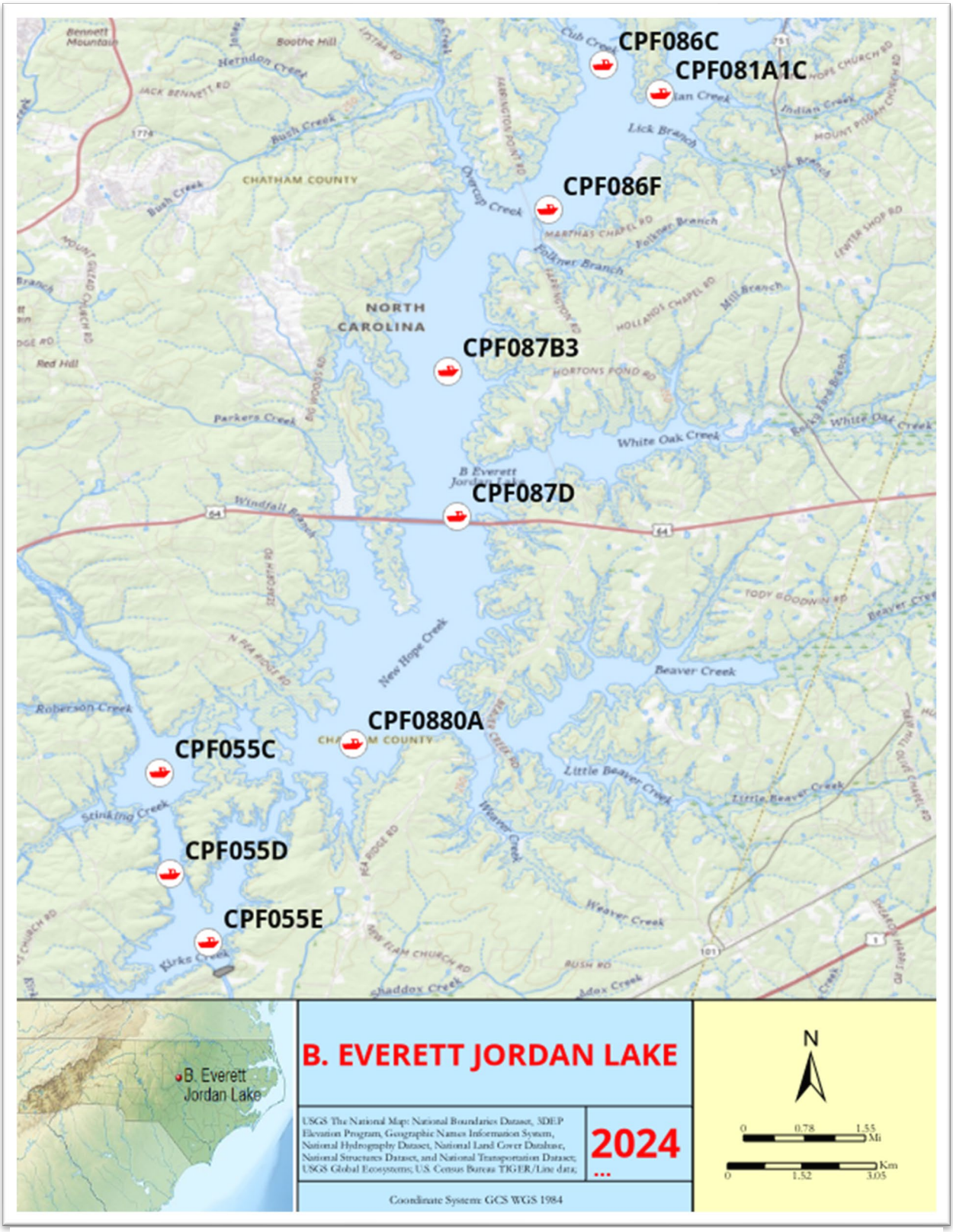

***Figure 1**. B. Everett Jordan Lake monitoring stations.*

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

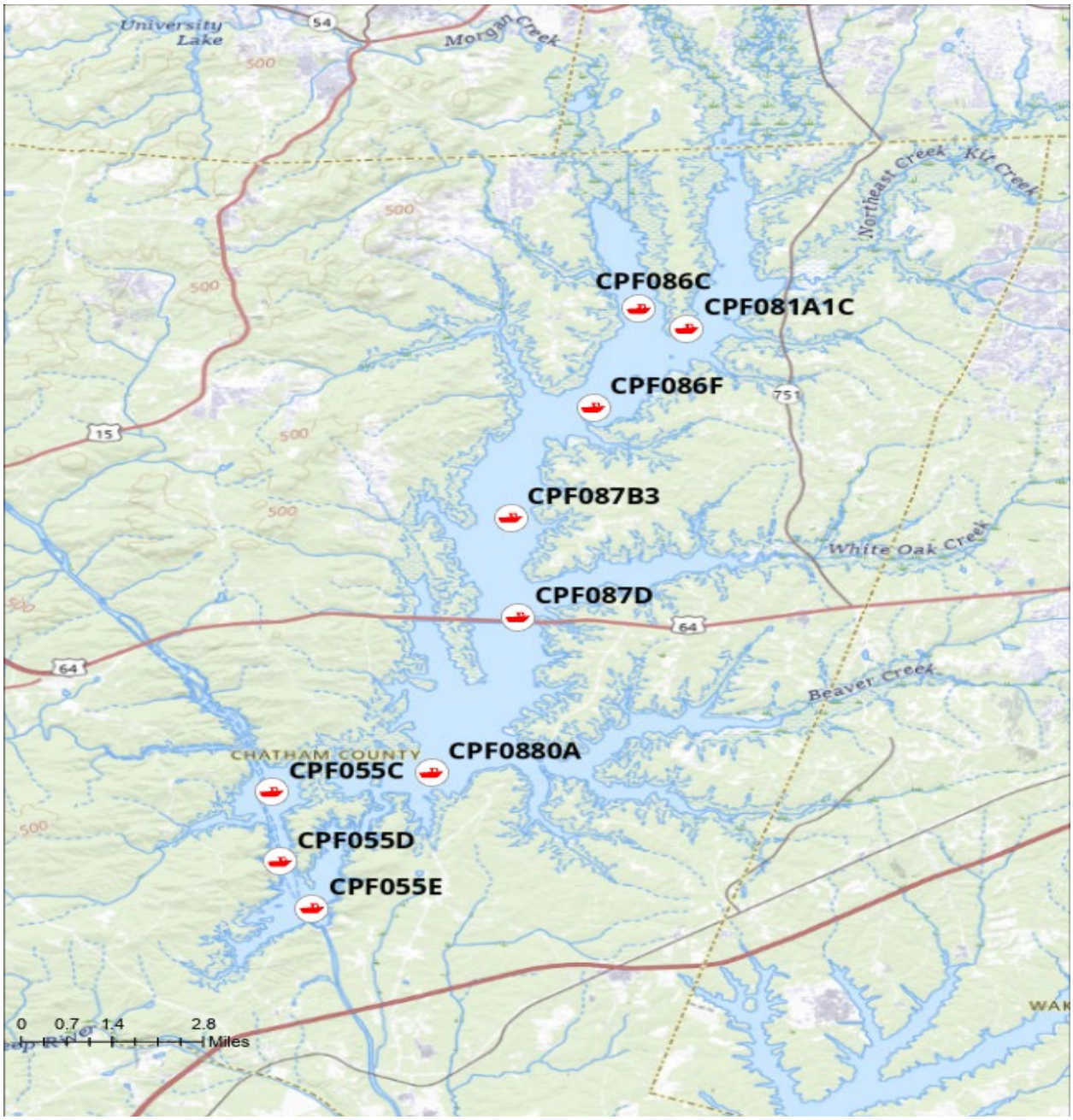

Figure 5. *Entirety of the management areas*

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%