

JORDAN LAKE ANNUAL REPORT 2023

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

THIS REPORT HAS BEEN APPROVED FOR RELEASE



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DATE: _____

Study for the Ongoing Assessment of Water Quality in B. Everett Jordan Lake: 2023 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 2023.

Methods:

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

A total of nine monitoring stations that represent the three lake management areas, Upper New Hope (Figure 1) Lower New Hope (Figure 2), and The Haw River arm (Figure 3) were sampled in Jordan Lake during 2023. All samples were collected in accordance with 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](#). All stations were sampled monthly throughout the year. Chemical samples were collected as a composite 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 collected through the water column in one-meter (m) increments with 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 1), Lower New Hope (Figure 2), and Haw River Arm (Figure 3). The tables display annual mean, minimum, and maximum concentrations for TP (mg/L), TN (mg/L), chl-a (µg/L), and Turbidity (NTU), DO (mg/L), and pH (s.u.). Data summaries are calculated from twelve sampling events (n) for all sites. Samples indicating questionable analytical results due to improper laboratory or field protocols were excluded from analysis in this report. This is reflected by the adjusted sample size for chl-a (n=10) for CPF055C, chl-a (n=11) for sample size for all other stations. TP (n=11 for CPF0880A. All other parameters (TN, Turbidity, DO and pH) had a sample size (n) of 12. Percent exceedance of state fresh surface water quality standards is shown for each station. Exceedance is defined by chl-a >40 µg/L; Turbidity >25 NTU; DO <4 mg/L; pH >9 or <6 s.u. All Nitrate + Nitrite and Ammonia data below analytical detection limit (< 0.02 mg/L) were normalized to 0.01 mg/L to calculate TN values. Results for additional

parameters not provided in this report are available upon request. Please direct any question or comments to the Intensive Survey Branch Supervisor, Jeff Deberardinis at jeff.deberardinis@deq.nc.gov.

Figure 1: Upper New Hope Section of Jordan Lake

CPF086C						
	TP	TN	CHL a	Turbidity	DO	Ph
n	12	12	11	12	12	12
MEAN	0.07	1.44	60.14	14.72	10.48	7.94
MIN	0.03	0.89	36	8.10	7.10	6.60
MAX	0.13	2.50	100	22.00	12.80	8.70
n>Standard			9	0.00	0.00	0.00
% Exceedance			81.82%	0.00%	0.00%	0.00%
% Confidence			100.00%	N/A	N/A	N/A

CPF081A1C						
	TP	TN	CHL a	Turbidity	DO	Ph
n	12	12	11	12	12	12
MEAN	0.08	1.20	62.32	14.58	10.81	7.93
MIN	0.03	0.18	29.5	3.90	5.80	5.90
MAX	0.11	1.83	91	20.00	13.40	9.00
n>Standard			10	0.00	0.00	1.00
% Exceedance			90.91%	0.00%	0.00%	8.33%
% Confidence			100.00%	N/A	N/A	N/A

CPF086F						
	TP	TN	CHL a	Turbidity	DO	Ph
n	12	12	11	12	12	12
MEAN	0.08	1.25	61.18	11.56	9.53	7.54
MIN	0.06	0.94	36	7.90	5.60	6.80
MAX	0.10	1.53	89	16.00	12.90	8.40
n>Standard			10	0.00	0.00	0.00
% Exceedance			90.91%	0.00%	0.00%	0.00%
% Confidence			100.00%	N/A	N/A	N/A

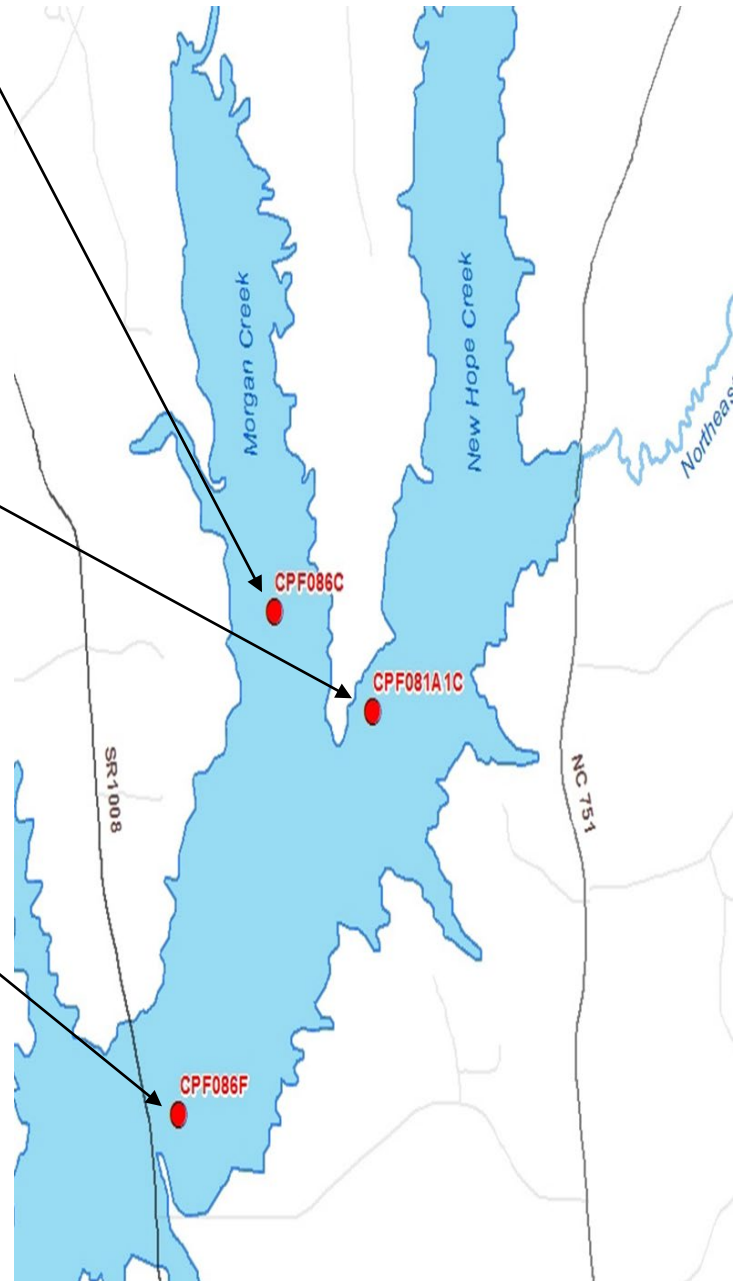


Figure 2: Lower New Hope Area of Jordan Lake

CPF087B3						
	TP	TN	CHL a	Turbidity	DO	Ph
n	12	12	11	12	12	12
MEAN	0.05	1.07	46.45	6.87	9.68	7.75
MIN	0.03	0.77	25	4.30	7.10	6.50
MAX	0.06	1.43	90	12.00	11.70	8.90
n>Standard			6	0.00	0.00	0.00
% Exceedance			54.55%	0.00%	0.00%	0.00%
% Confidence			99.97%	N/A	N/A	N/A

CPF087D						
	TP	TN	CHL a	Turbidity	DO	Ph
n	12	12	11	12	12	12
MEAN	0.04	0.91	36.32	6.53	9.41	7.39
MIN	0.03	0.03	22	4.50	6.60	5.50
MAX	0.06	1.23	62	12.00	11.40	9.00
n>Standard			4	0.00	0.00	2.00
% Exceedance			36.36%	0.00%	0.00%	16.67%
% Confidence			98.15%	N/A	N/A	65.90%

CPF0880A						
	TP	TN	CHL a	Turbidity	DO	Ph
n	11	12	11	12	12	12
MEAN	0.04	0.94	32.73	5.78	9.48	7.85
MIN	0.03	0.67	15	2.70	7.10	6.50
MAX	0.08	1.08	56	10.00	11.70	8.90
n>Standard			3	0.00	0.00	0.00
% Exceedance			27.27%	0.00%	0.00%	0.00%
% Confidence			91.04%	N/A	N/A	N/A



Figure 3: Haw River Arm of Jordan Lake

CPF055C						
	TP	TN	CHL a	Turbidity	DO	Ph
n	12	12	10	12	12	12
MEAN	0.07	0.99	33.85	10.69	10.21	7.87
MIN	0.03	0.72	9.5	2.30	7.60	7.00
MAX	0.11	1.47	56	28.50	12.50	9.10
n>Standard			4	1.00	0.00	1.00
% Exceedance			40.00%	8.33%	0.00%	8.33%
% Confidence			98.72%	28.24%	N/A	28.24%

CPF055D						
	TP	TN	CHL a	Turbidity	DO	Ph
n	12	12	11	12	12	12
MEAN	0.06	0.99	31.38	9.65	9.68	7.81
MIN	0.03	0.73	9.2	3.00	7.50	6.90
MAX	0.11	1.40	51	24.00	11.50	9.20
n>Standard			3	0.00	0.00	1.00
% Exceedance			27.27%	0.00%	0.00%	8.33%
% Confidence			91.04%	N/A	N/A	28.24%

CPF055E						
	TP	TN	CHL a	Turbidity	DO	Ph
n	12	12	11	12	12	12
MEAN	0.06	0.86	27.94	9.05	9.52	7.93
MIN	0.04	0.17	8.8	3.10	6.70	6.70
MAX	0.10	1.12	48	25.00	11.80	9.10
n>Standard			2	0.00	0.00	1.00
% Exceedance			18.18%	0.00%	0.00%	8.33%
% Confidence			69.73%	N/A	N/A	28.24%

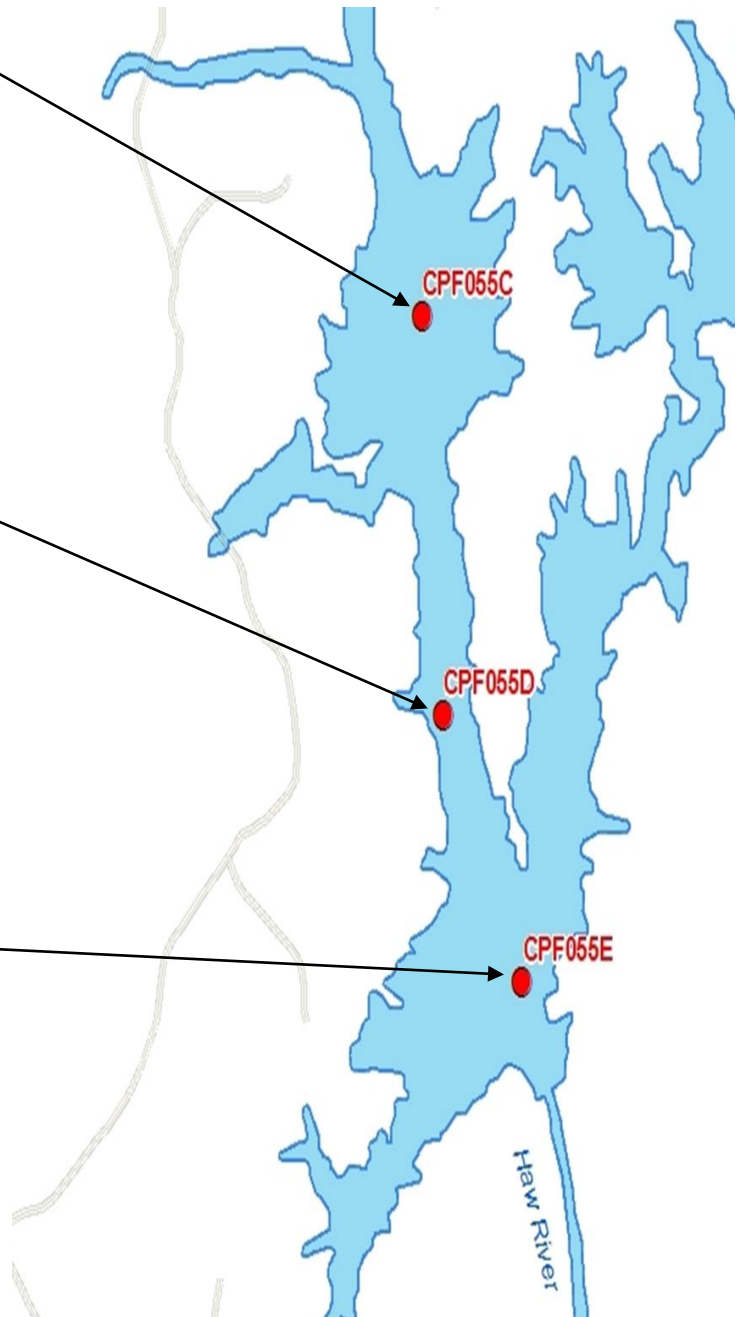
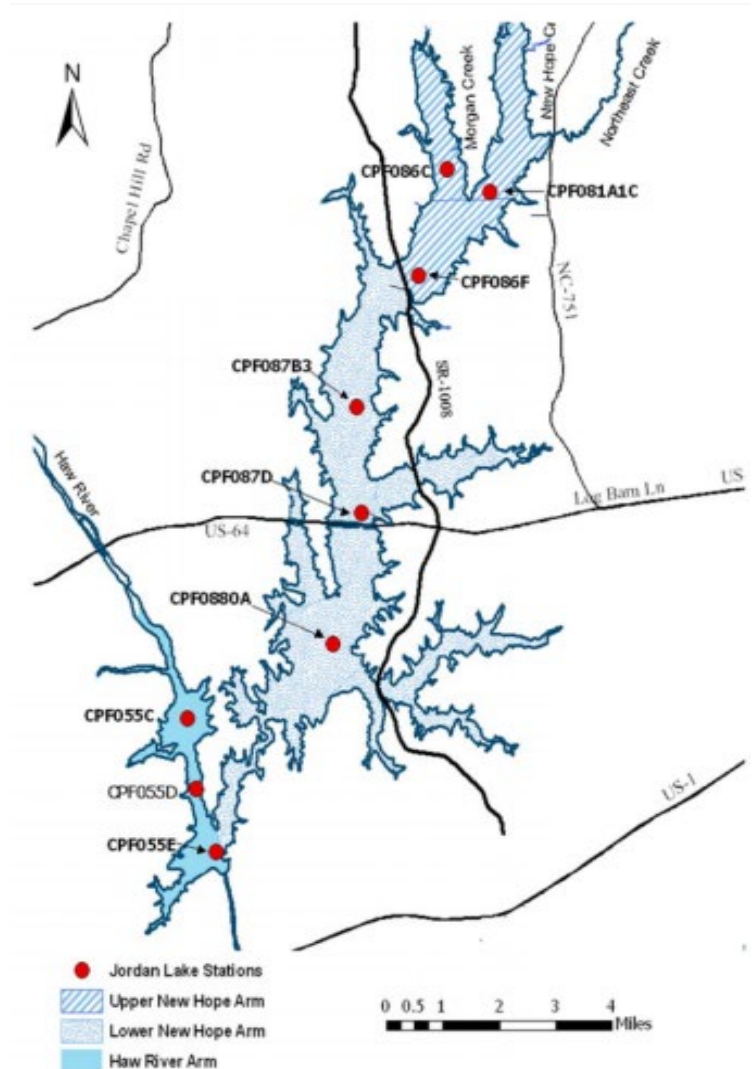


Figure 4. Jordan Lake 2023 Results

JORDAN LAKE						
	TP	TN	CHL a	Turbidity	DO	Ph
n	107	107	98	107	108	108
MEAN	0.06	1.07	43.69	9.94	9.86	7.78
MIN	0.03	0.03	8.8	2.30	5.60	5.50
MAX	0.13	2.50	100	28.50	13.40	9.20
n>Standard			51	1.00	0.00	6.00
% Exceedance			52.04%	0.93%	0.00%	5.56%
% Confidence			100.00%	0.00%	N/A	3.51%



Key for tables:

- n: number of sampling events
- n>standard: number of times sample exceeds water quality standards chla > 40ug/L; Turbidity > 25NTU; DO < 4mg/L; Ph > 9 or < 6 S.U.
- % Exeedance: Percentage of samples that were in exeedance of water quality standards
- % Confidence: States the percent statistical cofidence that the actual percentage of exeedences is greater than 10%. Low % confidence values are a result of a small sample size or exeedence values less than 10%