

JORDAN LAKE ANNUAL REPORT 2021

**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: 2021 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 2021.

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, Lower New Hope, and Haw River) were sampled in Jordan Lake during 2021. All stations were sampled monthly throughout the year, excluding the months of January and February due to sampling restrictions related to Covid-19. 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), Haw River Arm (Figure 3) and the entirety of Jordan Lake (Figure 4). 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 ten sampling events (n) for all sites. Samples were not collected in January and February due to restrictions related to Covid-19. 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=7), while all other parameters (TP, TN, Turbidity, and pH) had a sample size (n) of 10. 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 quantified as 0.01 mg/L to calculate TN values.

Figure 1. Upper New Hope Section of Jordan Lake 2021 Results

CPF086C						
	TP	TN	CHL a	Turbidity	DO	pH
n	10	10	7	10	10	10
MEAN	0.09	0.06	66.10	16.21	9.04	8.06
MIN	0.06	0.01	30.00	7.90	5.70	7.20
MAX	0.12	1.18	100.00	28.00	11.70	9.00
<i>n>Standard</i>			5	2	0	0
<i>% Exceedance</i>			71.4%	20.0%	0.0%	0.0%
<i>% Confidence</i>			100.0%	73.6%	N/A	N/A

CPF081A1C						
	TP	TN	CHL a	Turbidity	DO	pH
n	10	10	7	10	10	10
MEAN	0.09	0.51	70.29	15.56	9.05	8.00
MIN	0.06	0.01	35.00	8.30	6.60	7.20
MAX	0.11	1.25	113.00	26.00	11.90	9.00
<i>n>Standard</i>			6	1	0	0
<i>% Exceedance</i>			85.7%	10.0%	0.0%	0.0%
<i>% Confidence</i>			100.0%	34.9%	N/A	N/A

CPF086F						
	TP	TN	CHL a	Turbidity	DO	pH
n	10	10	7	10	10	10
MEAN	0.07	0.47	64.29	10.83	8.88	7.75
MIN	0.05	0.01	37.00	7.00	5.60	6.80
MAX	0.09	1.11	85.00	15.00	11.70	9.00
<i>n>Standard</i>			6	0	0	0
<i>% Exceedance</i>			85.7%	0.0%	0.0%	0.0%
<i>% Confidence</i>			100.0%	N/A	N/A	N/A

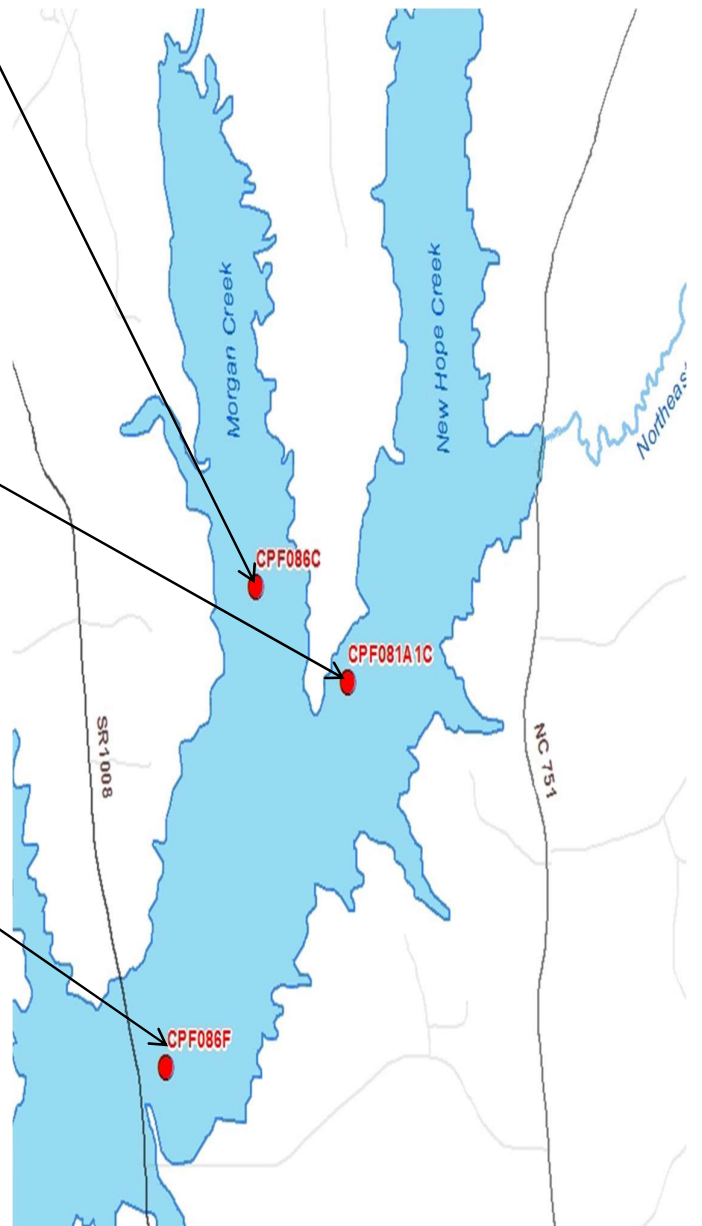


Figure 2. Lower New Hope Area of Jordan Lake 2021 Results

CPF087B3						
	TP	TN	CHL a	Turbidity	DO	pH
n	10	10	7	10	10	10
MEAN	0.05	0.39	54.14	7.04	8.38	7.82
MIN	0.03	0.01	29.00	3.80	5.40	7.10
MAX	0.06	1.01	83.00	11.00	10.90	8.70
<i>n>Standard</i>			5	0	0	0
% Exceedance			71.4%	0.0%	0.0%	0.0%
% Confidence			100.0%	N/A	N/A	N/A

CPF087D						
	TP	TN	CHL a	Turbidity	DO	pH
n	10	10	7	10	10	10
MEAN	0.05	0.38	46.29	6.32	8.47	7.83
MIN	0.03	0.01	21.00	3.30	5.20	7.20
MAX	0.06	1.01	63.00	11.00	11.50	8.70
<i>n>Standard</i>			6	0	0	0
% Exceedance			85.7%	0.0%	0.0%	0.0%
% Confidence			100.0%	N/A	N/A	N/A

CPF0880A						
	TP	TN	CHL a	Turbidity	DO	pH
n	10	10	7	10	10	10
MEAN	0.04	0.38	35.14	5.51	8.07	7.70
MIN	0.03	0.01	18.00	3.50	3.70	7.10
MAX	0.05	1.00	47.00	9.00	12.10	8.60
<i>n>Standard</i>			2	0	1	0
% Exceedance			28.6%	0.0%	10.0%	0.0%
% Confidence			85.0%	N/A	34.9%	N/A

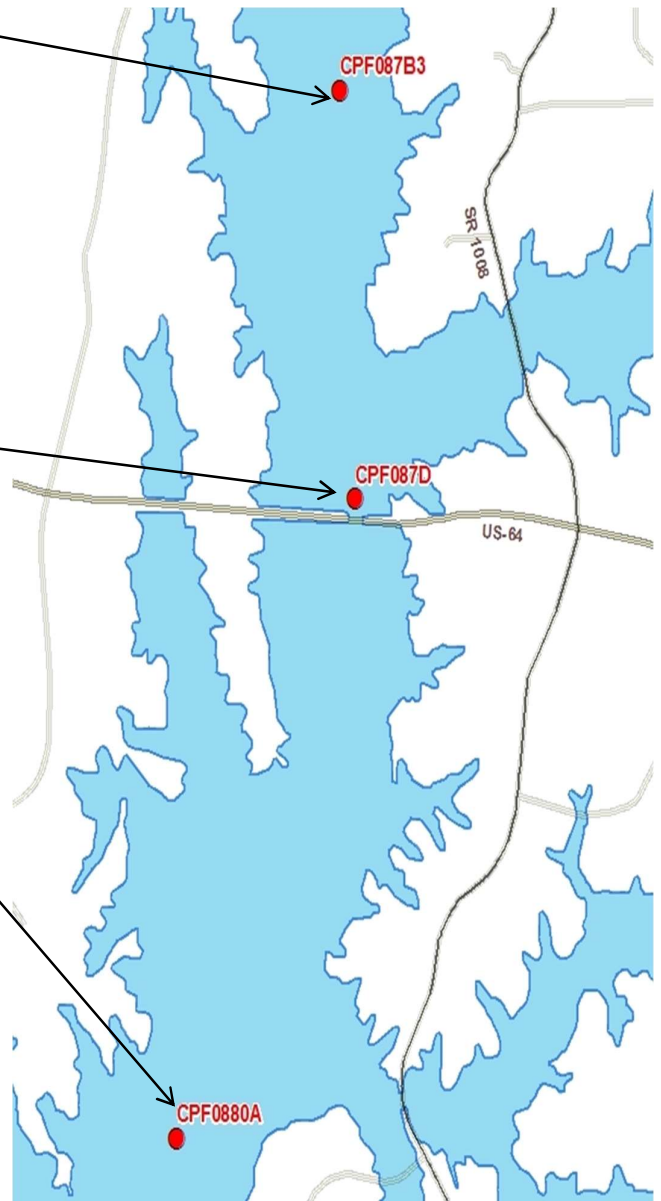


Figure 3. Haw River Arm of Jordan Lake 2021 Results

CPF055C						
	TP	TN	CHL a	Turbidity	DO	pH
n	10	10	7	10	10	10
MEAN	0.08	0.53	37.57	7.20	9.84	8.11
MIN	0.04	0.01	12.00	4.00	7.10	7.30
MAX	0.18	1.27	64.00	12.00	14.00	9.10
<i>n>Standard</i>			4	0	0	1
% Exceedance			57.1%	0.0%	0.0%	10.0%
% Confidence			99.7%	N/A	N/A	34.9%

CPF055D						
	TP	TN	CHL a	Turbidity	DO	pH
n	10	10	7	10	10	10
MEAN	0.07	0.51	32.00	6.05	9.46	8.11
MIN	0.04	0.01	17.00	4.30	4.80	7.10
MAX	0.14	1.12	53.00	10.00	14.50	9.20
<i>n>Standard</i>			1	0	0	1
% Exceedance			14.3%	0.0%	0.0%	10.0%
% Confidence			47.8%	N/A	N/A	34.9%

CPF055E						
	TP	TN	CHL a	Turbidity	DO	pH
n	10	10	7	10	10	10
MEAN	0.05	0.47	30.71	5.11	8.64	8.00
MIN	0.04	0.01	19.00	3.40	3.80	7.10
MAX	0.08	1.01	39.00	10.00	12.30	9.10
<i>n>Standard</i>			0	0	1	2
% Exceedance			0.0%	0.0%	10.0%	20.0%
% Confidence			N/A	N/A	34.9%	73.6%

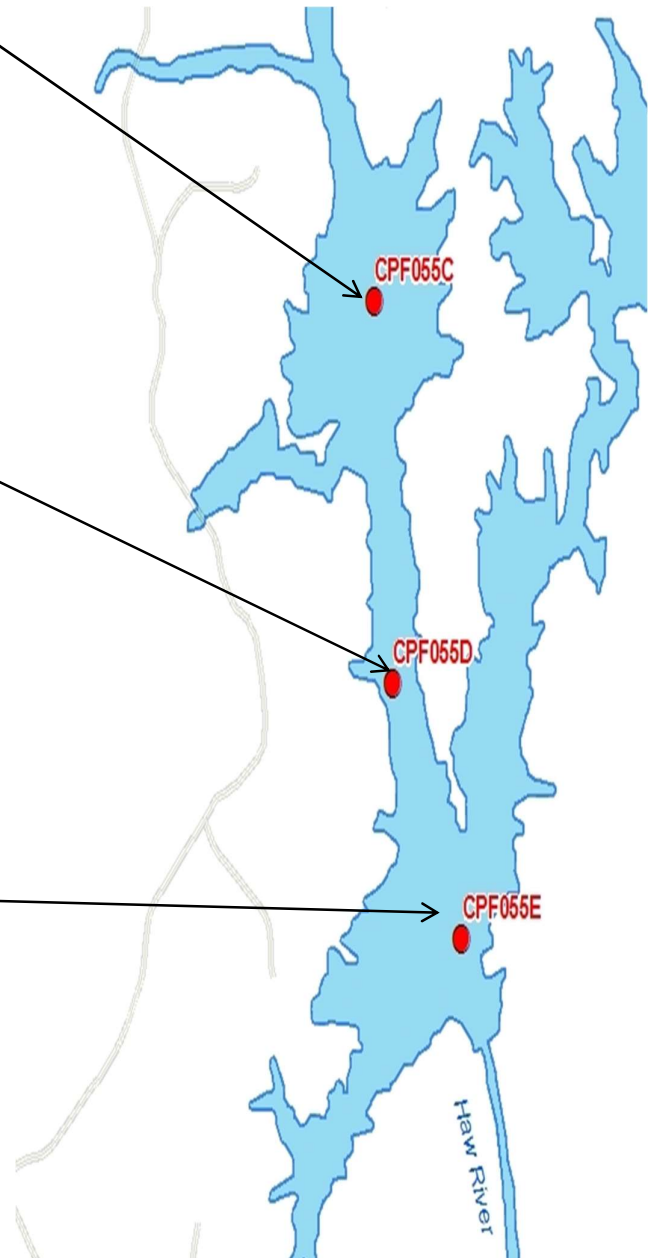
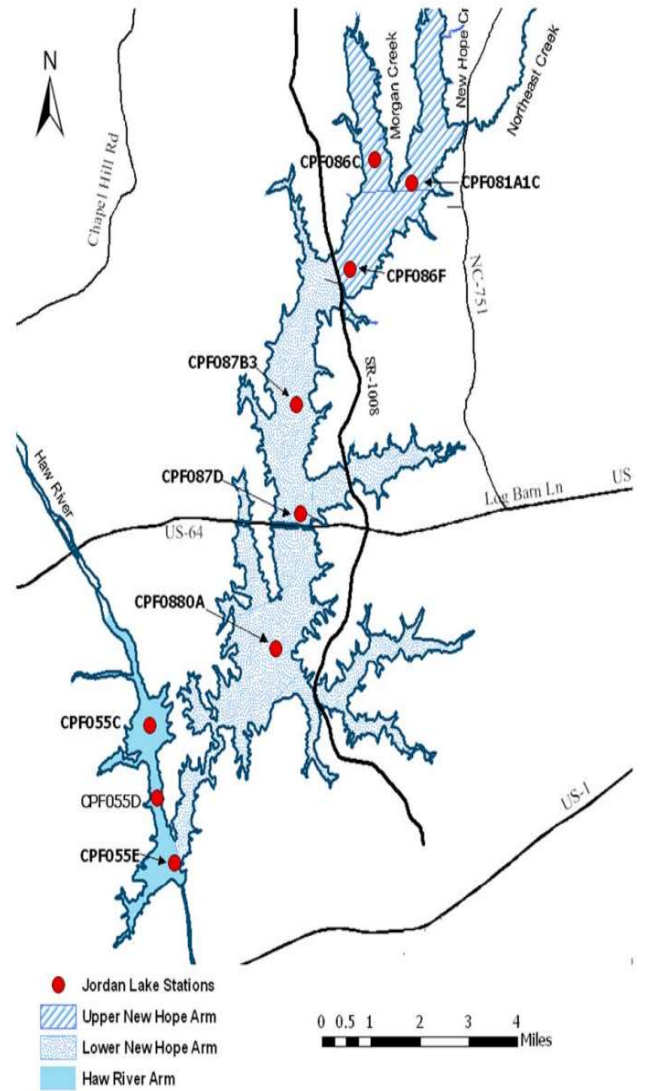


Figure 4. Jordan Lake 2021 Results



JORDAN LAKE						
	TP	TN	CHL a	Turbidity	DO	pH
n	90	90	63	90	90	90
MEAN	0.07	0.45	48.51	8.87	8.87	7.93
MIN	0.03	0.01	12.00	3.30	3.70	6.80
MAX	0.18	1.27	113.00	28.00	14.50	9.20
<i>n>Standard</i>			35	3	2	4
<i>% Exceedance</i>			55.6%	3.3%	2.2%	4.4%
<i>% Confidence</i>			100.0%	0.5%	0.1%	1.7%

