JORDAN LAKE ANNUAL REPORT 2022

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:

2022 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 2022.

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 2022. 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 (chla). 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), chla (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 chla (n=10) for CPF055C, CPF055D, CPF055E, CPF081A1C, CPF086F and CPF087D. Sample size for chla (n=9) for CPF086C and CPF0880A. Sample size for TP (n=11) for CPF086C, CPF081A1C, CPF086F, CPF0880A, CPF055C, CPF055D and CPF055E. All other parameters (TN, Turbidity, 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 chla >40 ug/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

CPF086C						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	11	12	10	12	12	12
MEAN	0.09	1.26	59.27	12.42	10.55	8.24
MIN	0.06	0.58	22.00	8.10	7.40	7.50
MAX	0.12	1.62	94.00	17.00	12.20	9.00
n>Standard			*8*	*0*	*11*	*0*
%Exceedance			***88.9%***	*0.0%*	*91.7%*	*0.0%*
% Confidence			*100.0%*	*N/A*	*100.0%*	*N/A*

CPF081A1C						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	11	12	10	12	12	12
MEAN	0.08	1.23	60.18	14.80	10.12	8.18
MIN	0.06	0.63	19.00	9.40	6.70	7.40
MAX	0.11	1.56	130.00	23.00	12.20	8.90
n>Standard			*8*	*0*	*0*	*0*
%Exceedance			***80.0%***	*0.0%*	*0.0%*	*0.0%*
% Confidence			*100.0%*	*N/A*	*N/A*	*N/A*

CPF086F						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	11	12	10	12	12	12
MEAN	0.07	1.12	49.45	9.62	9.98	8.00
MIN	0.05	0.56	19.00	6.60	7.20	7.40
MAX	0.05	1.53	72.00	15.00	12.70	8.90
n>Standard			*7*	*0*	*0*	*0*
%Exceedance			***70.0%***	*0.0%*	*0.0%*	*0.0%*
% Confidence			*100.0%*	*N/A*	*N/A*	*N/A*

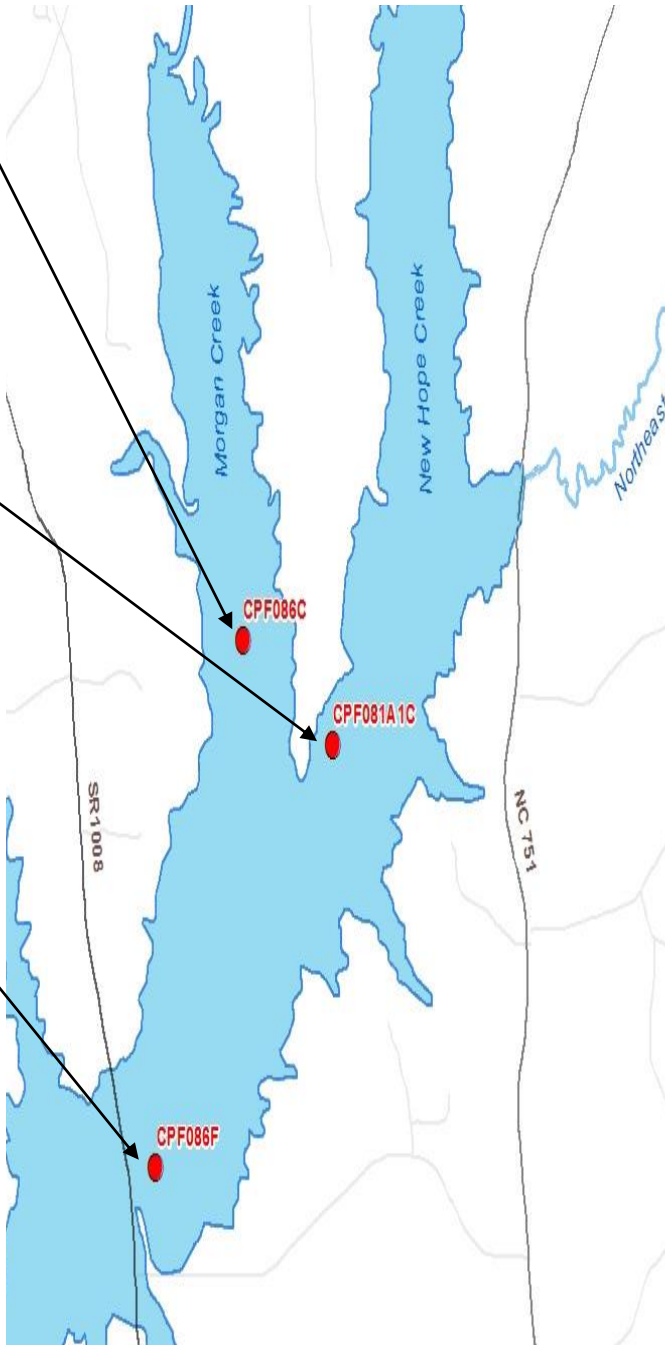

Figure 2: Lower New Hope Area of Jordan Lake

CPF087B3						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	11	12	10	12	12	12
MEAN	0.05	0.97	40.55	6.75	9.85	7.90
MIN	0.04	0.57	16.00	4.00	7.40	7.40
MAX	0.06	1.32	67.00	9.30	12.60	8.80
n>Standard			*5*	*0*	*0*	*0*
%Exceedance			***50.0%***	*0.0%*	*0.0%*	*0.0%*
% Confidence			*99.8%*	*N/A*	*N/A*	*N/A*

CPF087D						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	12	12	10	12	12	12
MEAN	0.04	0.88	28.33	5.63	9.60	7.86
MIN	0.03	0.47	0.00	3.70	6.80	7.30
MAX	0.05	1.22	48.00	7.70	12.60	8.50
n>Standard			*3*	*0*	*0*	*0*
%Exceedance			***30.0%***	*0.0%*	*0.0%*	*0.0%*
% Confidence			*93.0%*	*N/A*	*N/A*	*N/A*

CPF0880A						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	11	12	10	12	12	12
MEAN	0.04	0.90	30.80	5.50	9.60	7.96
MIN	0.03	0.68	20.00	3.60	7.50	7.50
MAX	0.06	1.12	55.00	9.30	11.70	8.70
n>Standard			*3*	*0*	*0*	*0*
%Exceedance			***33.33%***	*0.00%*	*0.00%*	*0.00%*
% Confidence			*92.98%*	*N/A*	*N/A*	*N/A*

Figure 3: Haw River Arm of Jordan Lake

CPF055C						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	11	12	10	12	12	12
MEAN	0.09	1.01	29.34	14.56	10.74	8.00
MIN	0.06	0.67	8.70	4.10	8.70	7.30
MAX	0.20	1.43	81.00	75.00	13.30	9.00
n>Standard			*3*	*1*	*0*	*0*
%Exceedance			***30.0%***	***8.3%***	*0.0%*	*0.0%*
% Confidence			*93.0%*	*28.2%*	*N/A*	*N/A*

CPF055D						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	11	12	10	12	12	12
MEAN	0.07	0.98	29.18	10.32	10.56	8.05
MIN	0.04	0.62	15.00	3.20	7.90	7.20
MAX	0.16	1.28	49.00	55.00	12.80	8.90
n>Standard			*2*	*1*	*0*	*0*
%Exceedance			***20.0%***	***8.3%***	*0.0%*	*0.0%*
% Confidence			*73.6%*	*28.2%*	*N/A*	*N/A*

CPF055E						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	11	12	10	12	12	12
MEAN	0.06	0.90	26.83	8.52	10.05	7.99
MIN	0.04	0.66	13.00	2.90	8.20	7.30
MAX	0.10	1.07	54.00	34.00	12.50	8.90
n>Standard			*2*	*1*	*0*	*0*
%Exceedance			***20.0%***	***8.3%***	*0.0%*	*0.0%*
% Confidence			*73.6%*	*28.2%*	*N/A*	*N/A*

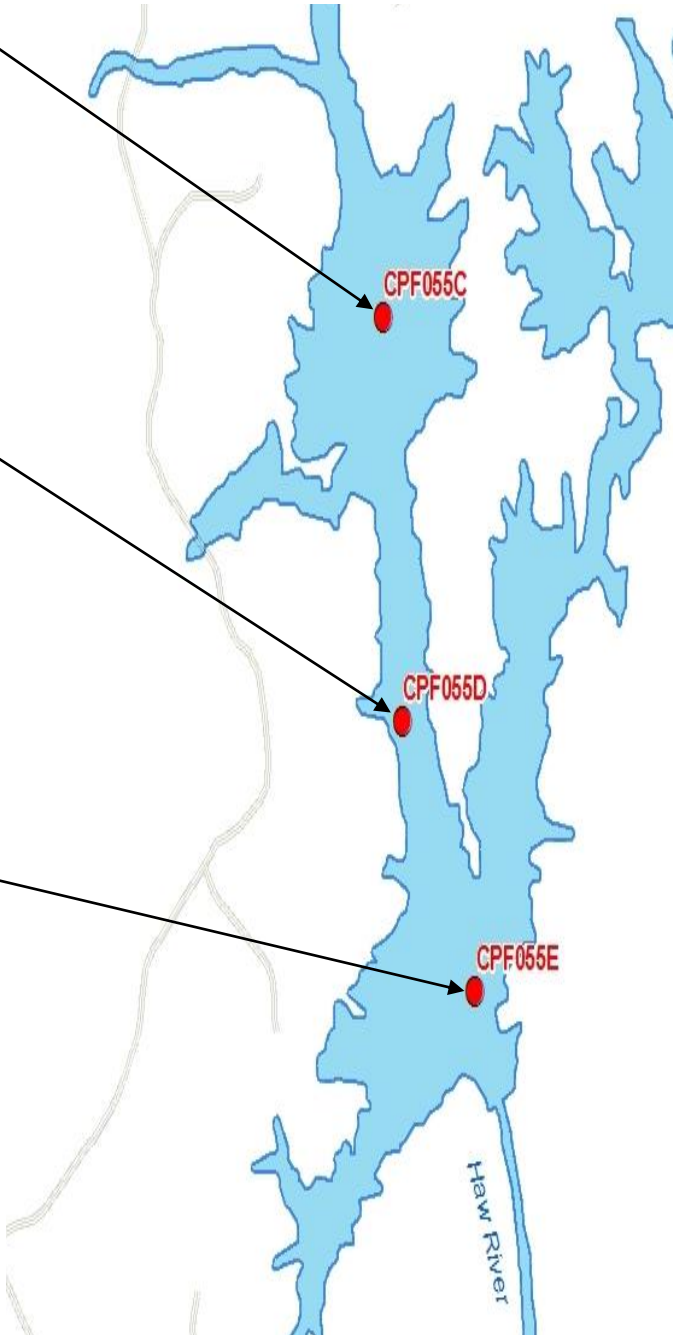

Figure 4. Jordan Lake 2022 Results

JORDAN LAKE						
	TP	**TN**	**CHL a**	**Turbidity**	**DO**	**pH**
n	101	108	88	108	108	108
MEAN	0.06	1.03	39.18	9.77	10.12	8.02
MIN	0.03	0.47	8.70	2.90	6.70	7.20
MAX	0.20	1.62	130.00	75.00	13.30	9.00
n>Standard			*41*	*3*	*0*	*0*
%Exceedance			***46.6%***	***2.8%***	*0.0%*	*0.0%*
% Confidence			*100.0%*	*0.1%*	*N/A*	*N/A*