Study for the Ongoing Assessment of Water Quality in Jordan Lake
2013 Results

Purpose:

The objective of this study is to evaluate progress in reducing nutrient and nutrient related pollution in Jordan Lake, as required by the Jordan water supply nutrient strategy (15A NCAC 02B.0262). This report summarizes results of samples collected in 2013.

Methods:

The detailed study plan can be found at http://portal.ncdenr.org/web/wq/fallsjordan. A total of nine monitoring stations were sampled in Jordan Lake during 2013 that represent the three lake management areas, Upper New Hope, Lower New Hope, and Haw River. All stations were sampled twice per month from May through September, and once per month during all other months. Chemical samples were collected from the photic zone and analyzed for total phosphorus (TP), total nitrogen (TN), ammonia (NH_3), nitrate + nitrite (NO_3+NO_2), 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. Results for each duplicate sample were averaged and used as a single result for data analyzed in 2013. Physical measurements of dissolved oxygen (DO), temperature, pH and conductivity were collected through the water column in one meter (m) increments with a mulitparameter meter.

Results:

One year summary results are presented by station for each of the three management areas, Upper New Hope (Figure 1), Lower New Hope (Figure 2) and Haw River Arm (Figure 3). These figures show annual mean (average), minimum and maximum concentrations for TP, TN (mg/L), Chla (µg/L), and turbidity (NTU) from the photic zone; DO (mg/L) and pH (s.u.) from a depth of 0.15 m (surface sample). Data summaries are calculated from seventeen sampling events (n = 17). Percent exceedance of state water quality standards are shown for each station with the respective percent confidence for 2013 samples. All nitrate + nitrite and ammonium data below detection (< 0.02 mg/L) were entered as 0.01 mg/L in order to calculate TN values.

Figure 1. Upper New Hope section of Jordan Lake 2013 Results

CPF086C	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.08	1.11	50	18	8.8	7.8
Min	17	0.06	0.97	24	8.4	5.7	6.3
Max	17	0.11	1.43	73	27	12	9.4
n > Standard				10*	2	0	2
% Exceedance				63%	12%	0%	12%
% Confidence				100%	48%	n/a	48%

CPF081A1C	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.10	1.10	52	19	8.5	7.7
Min	17	0.07	0.89	28	11	5.5	6.3
Max	17	0.15	1.42	96	28	12	9.1
n > Standard				11	3	0	1
% Exceedance				65%	18%	0%	6%
% Confidence				100%	76%	n/a	17%

CPF086F	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.08	1.01	41	13	8.4	7.7
Min	17	0.06	0.78	22	6.5	4.9	5.9
Max	17	0.13	1.41	84	21	12	8.7
n > Standard				7	0	0	1
% Exceedance				41%	0%	0%	6%
% Confidence				100%	n/a	n/a	17%

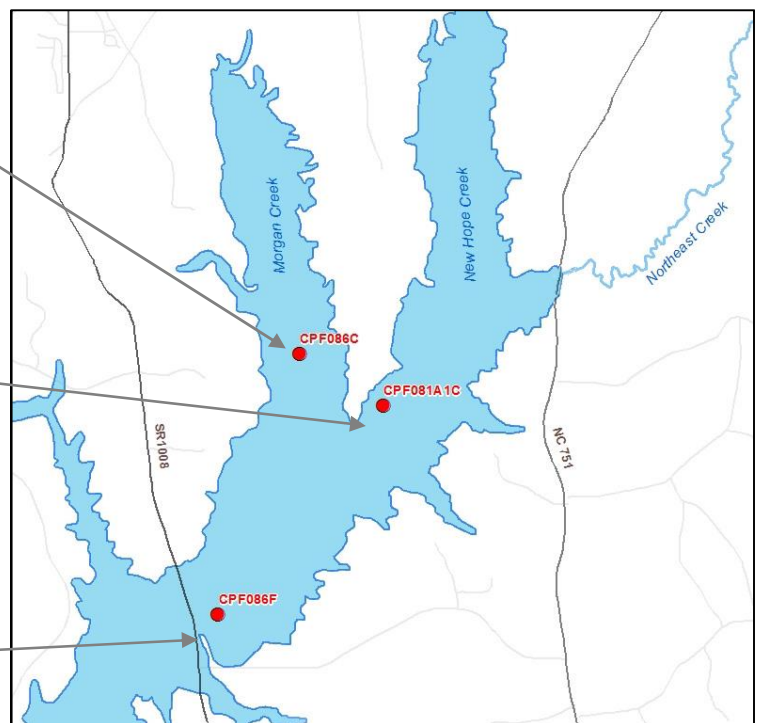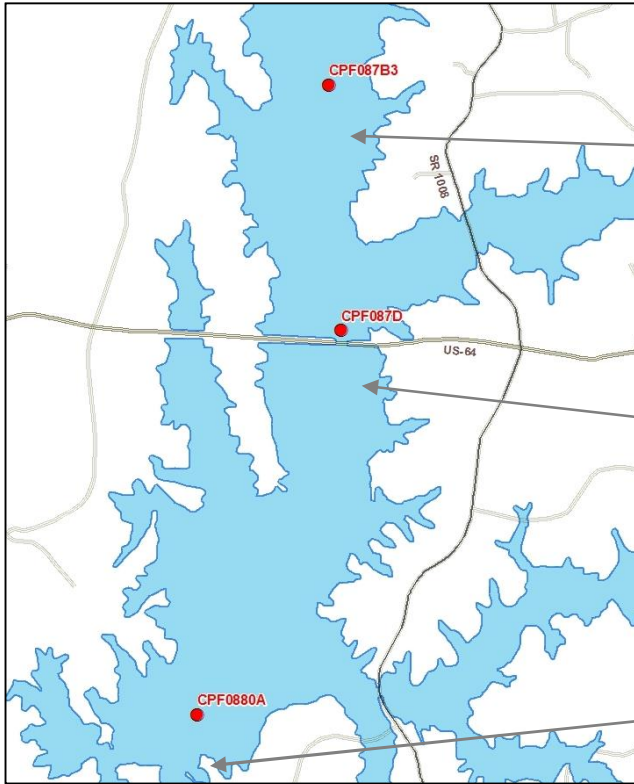**Figure 2.** Lower New Hope area of Jordan Lake 2013 Results

CPF087B3	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.05	0.86	31	7.6	7.9	7.4
Min	17	0.04	0.69	14	4.1	4.4	6.5
Max	17	0.07	1.24	52	12	13	7.9
n > Standard				4	0	0	0
% Exceedance				24%	0%	0%	0%
% Confidence				92%	n/a	n/a	n/a

| CPF087D	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.04	0.85	26	7.1	8.4	7.5
Min	17	0.04	0.59	11	4.4	5.7	6.7
Max	17	0.06	1.13	44	12	12	8.4
n > Standard				2*	0	0	0
% Exceedance				13%	0%	0%	0%
% Confidence				52%	n/a	n/a	n/a

CPF0880A	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.04	0.85	23	5.7	8.1	7.7
Min	17	0.03	0.63	9	3.3	4.8	6.1
Max	17	0.05	1.22	45	9.2	12	8.6
n > Standard				1	0	0	0
% Exceedance				6%	0%	0%	0%
% Confidence				17%	n/a	n/a	n/a

Figure 3. Haw River Arm of Jordan Lake 2013 Results

CPF055C	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.08	1.22	31	12	9.4	8.2
Min	17	0.06	0.98	7	4.6	6.7	6.6
Max	17	0.14	1.78	63	39	12	9.4
n > Standard				6	2	0	3
% Exceedance				35%	12%	0%	18%
% Confidence				100%	48%	n/a	76%

CPF055D	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.07	1.17	29	8.9	8.9	8.0
Min	17	0.01	0.91	8	4.1	6.9	6.3
Max	17	0.12	1.61	43	22	12	9.2
n > Standard				2	0	0	2
% Exceedance				12%	0%	0%	12%
% Confidence				48%	n/a	n/a	48%

CPF055E	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.06	1.06	27	7.5	8.7	7.9
Min	17	0.04	0.75	11	3.8	6.3	6.4
Max	17	0.09	1.48	45	19	12	8.9
n > Standard				1*	0	0	0
% Exceedance				6%	0%	0%	0%
% Confidence				19%	n/a	n/a	n/a
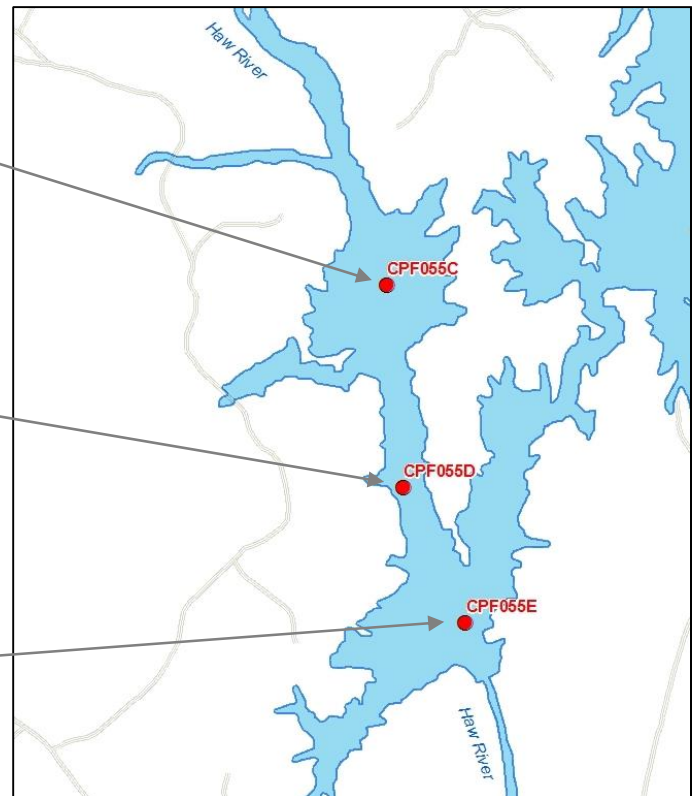
*Represents 16 chlorophyll *a* samples