Study for the Ongoing Assessment of Water Quality in Jordan Lake
2015 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) (i.e. the "Jordan Lake Rules"). This report summarizes results of samples collected in 2015.

Methods:

The detailed study plan can be found here. A total of nine monitoring stations were sampled in Jordan Lake during 2015 that represent the three lake management areas: Upper New Hope, Lower New Hope, and Haw River. All stations were sampled twice per month during the growing season (May through September) and once per month during the off season (January through April and October through December). 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. 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.
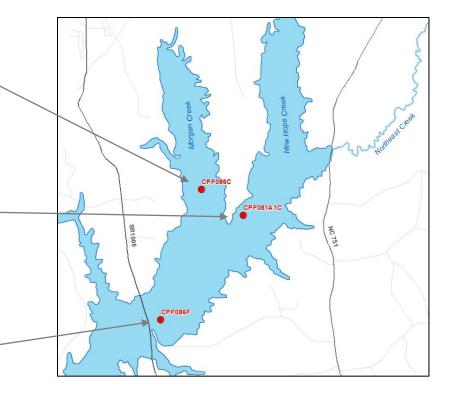
Results:

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, minimum, and maximum concentrations for TP (mg/L), 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. 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 detection (< 0.02 mg/L) were quantified as 0.01 mg/L in order to calculate TN values.
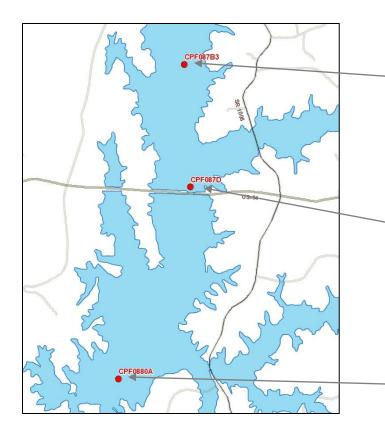
Figure 1. Upper New Hope Section of Jordan Lake 2015 Results

CPF086C						
	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.09	1.17	63.8	20.5	9.91	8.3
Min	17	0.06	0.89	32.0	12.0	6.77	5.3
Max	17	0.14	1.51	116.0	40.0	12.82	9.3
n > Standard				13	4	0	4
% Exceedance				76.5%	23.5%	0.0%	23.5%
% Confidence				100.0%	91.7%	n/a	91.7%

CPF081A1C						
	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.09	1.18	67.2	24.0	9.91	8.2
Min	17	0.06	0.98	38.0	16.0	5.02	5.2
Max	17	0.14	1.41	120.0	45.0	12.90	9.3
n > Standard				16	4	0	3
% Exceedance				94.1%	23.5%	0.0%	17.6%
% Confidence				100.0%	91.7%	n/a	76.2%

CPF086F						
	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.07	1.07	52.8	16.3	9.23	8.0
Min	17	0.04	0.83	22.0	8.6	7.12	5.1
Max	17	0.13	1.41	91.0	35.0	12.00	9.1
n > Standard				11	2	0	2
% Exceedance				64.7%	11.8%	0.0%	11.8%
% Confidence				100.0%	48.2%	n/a	48.2%

Figure 2. Lower New Hope Area of Jordan Lake 2015 Results

CPF087B3							
	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.04	0.90	36.5	7.7	9.28	7.9
Min	17	0.02	0.71	11.0	4.7	7.94	5.3
Max	17	0.05	1.15	53.0	12.0	11.80	9.0
n > Standard				8	0	0	1
% Exceedance				47.1%	0.0%	0.0%	5.9%
% Confidence				100.0%	n/a	n/a	16.7%

CPF087D							
	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.04	0.87	29.7	7.1	8.98	7.7
Min	17	0.02	0.61	8.5	3.6	7.28	5.5
Max	17	0.06	1.08	57.0	13.0	11.40	9.0
n > Standard				3	0	0	1
% Exceedance				17.6%	0.0%	0.0%	5.9%
% Confidence				76.2%	n/a	n/a	16.7%

CPF0880A							
	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.04	0.84	24.9	7.0	8.78	7.9
Min	17	0.02	0.56	8.7	2.6	5.43	6.9
Max	17	0.07	1.20	44.0	18.0	12.30	8.8
n > Standard				2	0	0	0
% Exceedance				11.8%	0.0%	0.0%	0.0%
% Confidence				48.2%	n/a	n/a	n/a

Figure 3. Haw River Arm of Jordan Lake 2015 Results

CPF055C							
	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.09	1.14	31.7	15.2	10.10	8.3
Min	17	0.05	0.88	5.8	5.4	5.81	6.9
Max	17	0.14	1.64	65.0	50.0	13.39	9.5
n > Standard				5	3	0	8
% Exceedance				29.4%	17.6%	0.0%	47.1%
% Confidence				97.8%	76.2%	n/a	100.0%

CPF055D							
	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.07	1.06	28.1	11.8	9.46	8.2
Min	17	0.04	0.82	9.4	4.5	4.91	6.9
Max	17	0.13	1.53	64.0	45.0	11.40	9.3
n > Standard				2	2	0	5
% Exceedance				11.8%	11.8%	0.0%	29.4%
% Confidence				48.2%	48.2%	n/a	97.8%

CPF055E							
	n	TP	TN	Chla	Turbidity	DO	pH
Mean	17	0.06	0.98	26.9	9.7	9.33	8.2
Min	17	0.04	0.75	9.1	4.0	6.26	7.1
Max	17	0.11	1.26	41.0	31.0	11.20	9.2
n > Standard				2	2	0	2
% Exceedance				11.8%	11.8%	0.0%	11.8%
% Confidence				48.2%	48.2%	n/a	48.2%