Study for the Ongoing Assessment of Falls of the Neuse Reservoir 2013 Results

<u>Purpose</u>

The objective of this study is to evaluate progress in attainment of water quality standards and use support in Falls of the Neuse Reservoir (Falls Lake) as required by the Falls water supply nutrient strategy (15A NCAC 02B.0275). Data for load reduction estimates are not part of this particular study. This report summarizes sample results collected in 2013.

Methods

A detailed study plan can be found at <u>http://portal.ncdenr.org/web/wq/fallsjordan</u>. This study has 11 stations that were sampled monthly for one year. Chemical samples were collected from the photic zone and analyzed for total phosphorus (TP), total nitrogen (TN), total organic carbon (TOC), 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. Results for each duplicate station 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

Results are presented by station in the two management areas, Lower Falls Lake (Figure 1) and Upper Falls Lake (Figure 2). These figures show annual mean (average), minimum and maximum concentrations for TP, TN, Chla (μ g/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 twelve sampling events (n = 12). 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 to calculate TN values.

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	% Confi	dence	2		n/a	n/a	n/a	n/a

Figure 1. Lower Falls Lake 2013 Results

Environmental Services Section

Figure 2. Upper Falls Lake 2013 Results

			NE	U013							
	n	ТР	TN	Chla	Turb	DO	рН			n	1
Mean	12	0.10	1.06		24	10	7.4		Mean	12	0.
Min	12	0.07	0.75		16	5.7	5.6		Min	12	0.
Max	12	0.16	1.41		40	14	8.3		Max	12	0.
n > stan	ndard			n/a	5	0	1		n > star	ndard	
% Excee				n/a	42%	0%	8%		% Excee	edanc	е
% Confi	idence	2		n/a	100%	n/a	28%		% Confi	idence	2
A and a set		UEUQ	13 EU 01 3 H	PR Y	The stand of the s	Jun 21		LC01 U018E		/	1 1 9 9 1
			Z	why a	n	-1	(L	Rund	X		

	NEU013B												
	n	ТР	TN	Chla	Turb	DO	рН						
Mean	12	0.10	0.94	39	22	9.6	7.3						
Min	12	0.07	0.72	26	8	4.8	5.8						
Max	12	0.27	1.11	52	39	14	8.3						
n > stan	dard			3*	5	0	1						
% Excee	danc	е		27%	42%	0%	8%						
% Confi	dence	2		89%	100%	n/a	28%						

	LC01											
		n	TP	ΤN	Chla	Turb	DO	рН				
	Mean	12	0.06	0.81	36	10	9.6	7.5				
/	Min	12	0.04	0.69	24	7.4	5.0	6.3				
	Max	12	0.06	0.89	58	13	13	8.5				
	n > stan	dard			5*	0	0	0				
	% Excee	danc	е		45%	0%	0%	0%				
	% Confi	dence	2		100%	n/a	n/a	n/a				

NEU018E											
	n	ТР	TN	Chla	Turb	DO	рН				
Mean	12	0.05	0.81	33	8.7	9.7	7.7				
Min	12	0.04	0.69	24	5.2	6.0	6.1				
Max	12	0.08	0.97	50	16	13	9.0				
n > stan	dard			3	0	0	0				
% Excee	danc	е		25%	0%	0%	0%				
% Confi	dence	2		89%	n/a	n/a	n/a				

	n	TP	TN	Chla	Turb	DO	рН
Mean	12	0.05	0.83	34	9.5	9.4	7.6
Min	12	0.04	0.73	19	6.4	6.1	6.2
Max	12	0.06	1.00	46	15	13	8.7
n > star	ndard			3	0	0	0
% Excee	danc	е		25%	0%	0%	0%
% Confi	dence	2		89%	n/a	n/a	n/a

	LLC01												
	n	ТР	ΤN	Chla	Turb	DO	рН						
Mean	12	0.08	0.84	38	11	9.5	7.2						
Min	12	0.05	0.67	26	6.4	4.6	5.9						
Max	12	0.30	0.97	54	19	12	8.3						
n > star	dard			5*	0	0	1						
% Excee	danc	е		45%	0%	0%	8%						
% Confi	dence	2		100%	n/a	n/a	28%						

	NEU0171B												
	n	ТР	TN	Chla	Turb	DO	рН						
Mean	12	0.06	0.83	36	11	9.66	7.3						
Min	12	0.04	0.73	23	7.3	5.0	5.7						
Max	12	0.10	0.96	62	17	12	8.7						
n > stan	dard			4	0	0	1						
% Excee	danc	е		33%	0%	0%	8%						
% Confidence 97% n/a n/a 28%													

*Represents 11 chlorophyll *a* samples

LI01