



Overview of Falls Lake 2016 Status Report

Department of Environmental Quality





- Division required to report to the EMC every 5 years
 - First report January 2016
- Purpose
 - Provide EMC & public update on strategy implementation
 - Detail water quality progress in Falls Lake
 - Advancements in scientific understanding & technology
- Report is part of adaptive management approach
 - Opportunity to make recommendations in report
 - EMC may make recommendations based on report findings

Topics Covered in Report



Subject Areas Detailed in Rule (.0275)

- Changes in lake loading
- Progress towards WQ standards
- State of wastewater treatment technology
- State of stormwater treatment technology
- Use of reuse and land application
- Utilization of nutrient offset
- Results of instream loading studies
- Results of septic and DSF loading studies
- Programmatic measures
- Atmospheric deposition
- Results of studies groundwater studies
- Updates to accounting tools

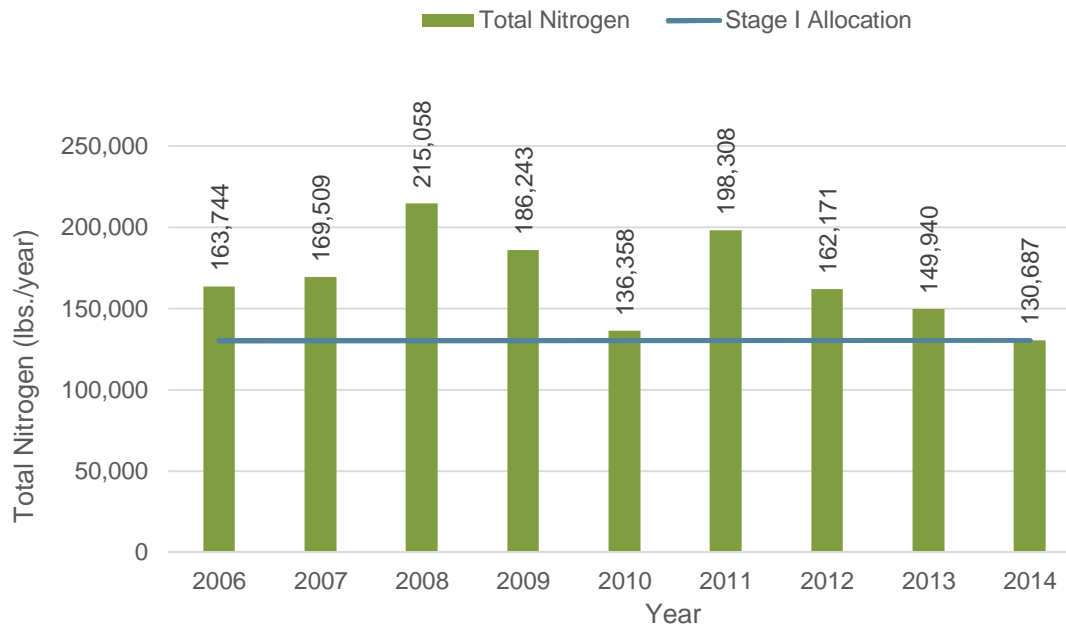


- Background & History
- Implementation Progress & Water Quality
 - Strategy Progress
 - Changes in Lake Loading
 - Lake Water Quality
- Tech Advancement & Scientific Understanding
 - Wastewater & Stormwater Treatment Technology
 - Current & Projected use of Reuse & Land Application
 - Programmatic Measures
 - Updates to Accounting Tools
 - Utilization of Nutrient Offsets
 - Atmospheric Deposition
 - Summary of Groundwater, DSF, and Septic Studies

Strategy Implementation

Point Sources

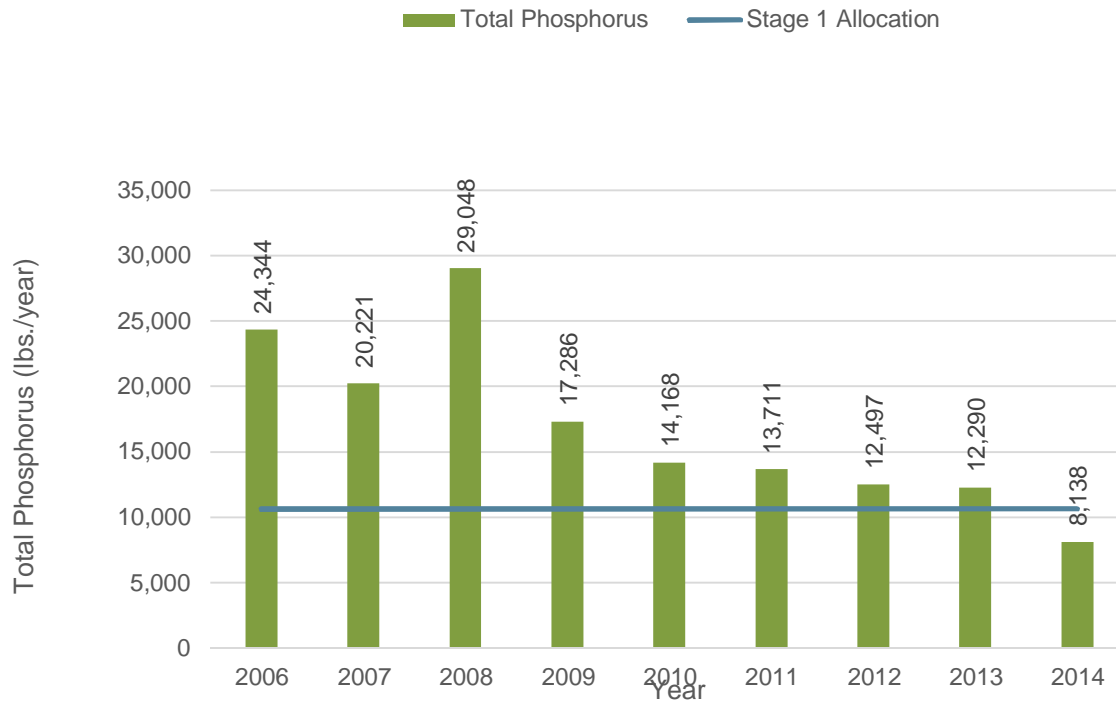
- Point Source TN load down 35%



Strategy Implementation

Point Sources

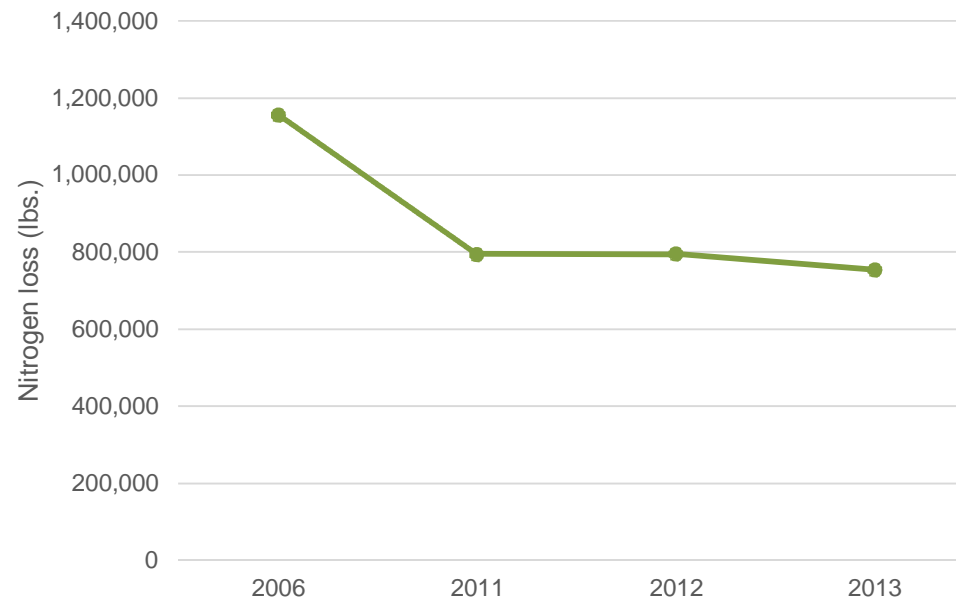
- Point Source TP load down 67%



Strategy Implementation

Agriculture

- As of 2013 agriculture estimates it has achieved a 35% reduction in nitrogen loss from cropland.



Rule Implementation Status

New Development Stormwater



- LG's Began Implementing SW Programs July 2012.
- Nutrient Offset Payments As of June of 2015
 - 50,766 lbs. of nitrogen
 - 3,645 lbs. of phosphorus

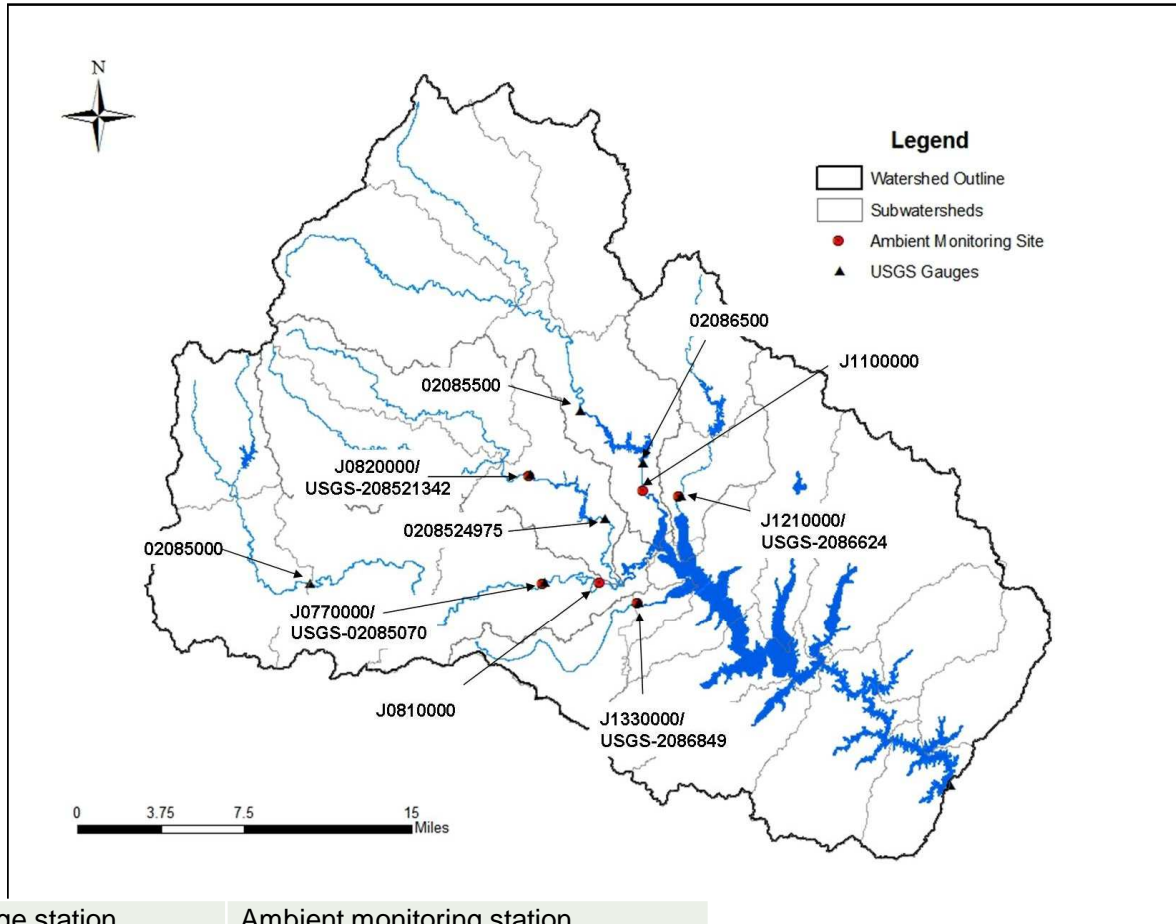
	Nitrogen	Phosphorus
Total transactions	107	68
Total Credits (lbs)	50,766	3,645
Total Acres	22.34	24.99

Rule Implementation Status

Existing Development & State and Federal Entities

- Existing Development
 - LGs submitted Inventories in 2013
 - UNRBA & DWR working on expanding BMP toolbox
 - DWR proposing to bring model program to Nov 2016 EMC
- State & Federal Entities
 - New Development requirements in place
 - Only one NCDOT new development project to date
 - NCDOT implementing 10 bmp retrofits

Changes in Lake Loading



Tributary	USGS gage station	Ambient monitoring station
Knap of Reeds	USGS 02086624	J1210000
Flat River	USGS 02086500	J1100000
Little River	USGS 0208524975	J0810000
Eno River	USGS 02085070	J1330000
Ellerbe Creek	USGS 02086849	J1330000



Changes in Loading to the Lake

N Loss Estimation Worksheet (NLEW)



Combined Nutrient Load from the Five Major Tributaries	Phosphorus (lbs/year)	Nitrogen (lbs/year)
2006	107,915	819,854
2007	82,283	691,397
2008	104,612	935,335
2013	56,223	925,732
2014	48,413	991,186

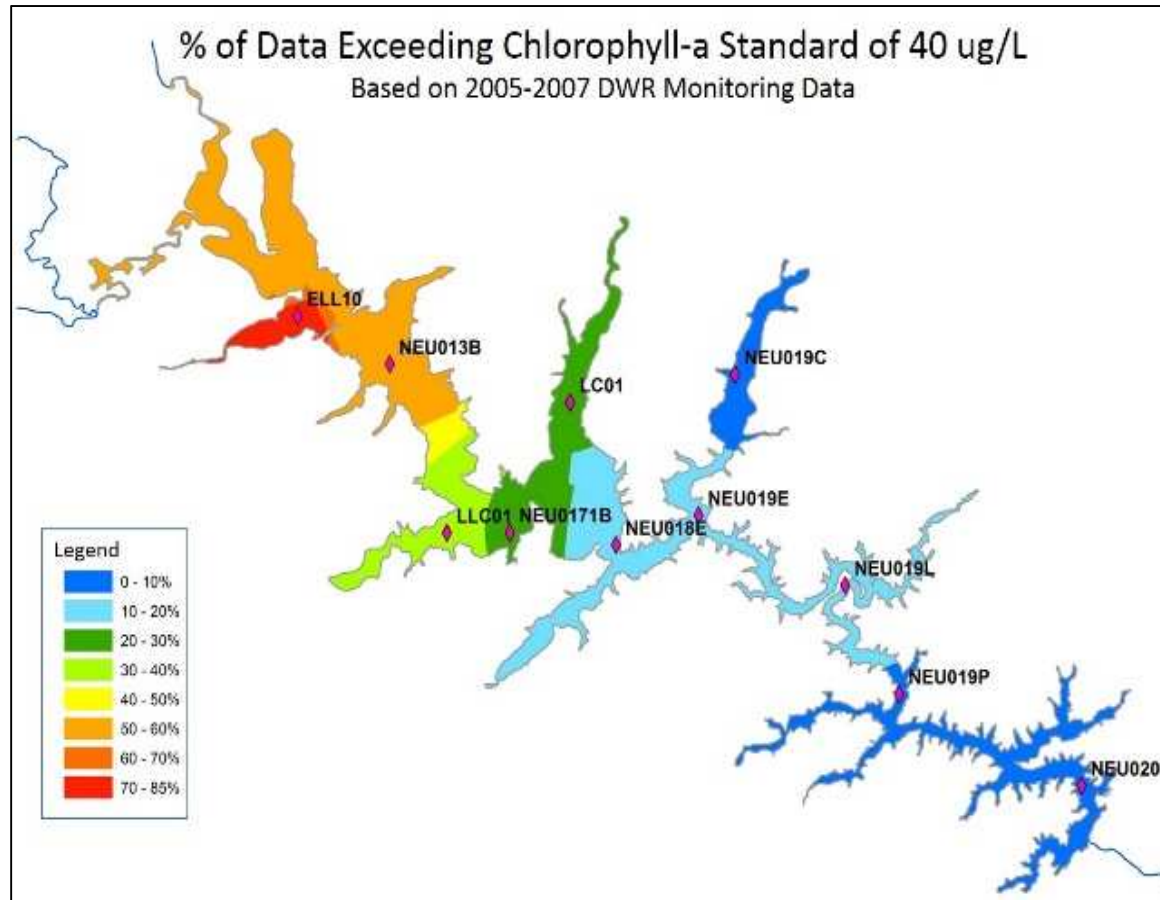
- Nitrogen load up 20% since baseline
- Phosphorus load down 55% since baseline

- 2014 was wet year with flows up 60 percent since baseline

Note: Load estimates are not available from 2009 to 2012 as budget constraints resulted in an insufficient number of sampling events to allow load estimation.

Water Quality in the Lake

2005-2007 (Before Rule Implementation)

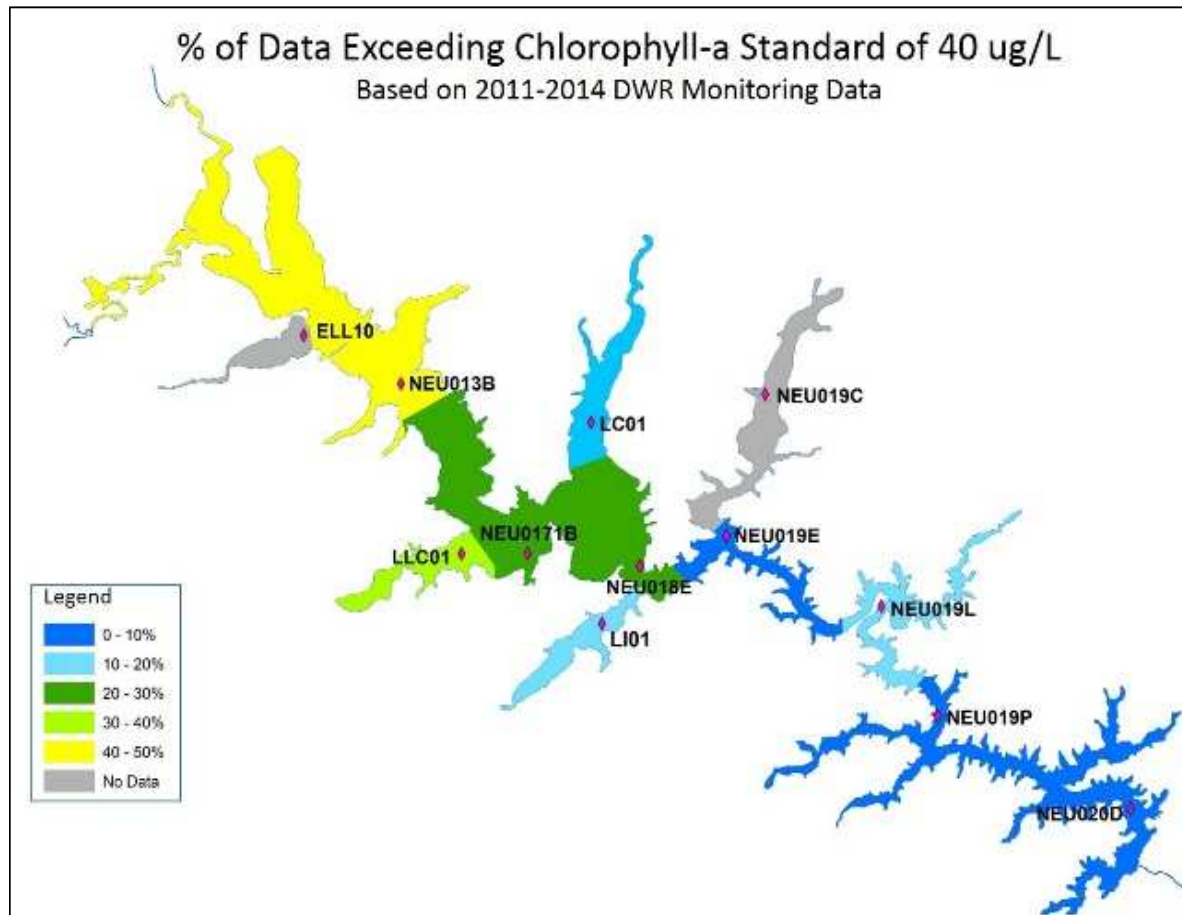


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Water Quality in the Lake

2011-2014 (Post Rule Implementation)



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Water Quality in the Lake



Station	2005-2007		Post-Strategy Start 2011-2014	
	n	Percent over 40 ug/L	n	Percent over 40 ug/L
Mainstem				
NEU013B	50	53%	47	45%
NEU0171B	51	25%	47	28%
NEU018E	51	16%	47	21%
NEU019C	51	4%	not sampled	
NEU019E	51	16%	48	8%
NEU019L	51	12%	48	10%
NEU019P	51	10%	47	6%
NEU020D	51	10%	46	4%
Arms				
ELL10	38	84%	not sampled	
LC01	38	21%	46	17%
LLC01	38	39%	46	33%
LI01	0	n/a	44	14%



- Tech Advancement & Scientific Understanding
 - Wastewater & Stormwater Treatment Technology
 - Current & Projected use of Reuse & Land Application
 - Programmatic Measures
 - Updates to Accounting Tools
 - Utilization of Nutrient Offsets
 - Atmospheric Deposition
 - Summary of Groundwater, DSF, and Septic Studies
- Addresses Ongoing UNRBA Work
 - Monitoring Project
 - Measures Project
 - Trapping factors, WTM Tool

Falls Lake 2016 Status Report



- Summary
 - Implementation proceeding in timely fashion
 - Nutrient loading & water quality generally improving
 - Regulated community working constructively & collaboratively w/ the Divisions
- Next Steps
 - Comments due December 4th
 - Present report to January EMC
- WQC Meeting January 13th
- EMC Meeting January 14th

QUESTIONS?



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Local Government Programmatic Measures

Local Government	Programmatic Practice
Butner	IDDE Program
Creedmoor	Improved Street Sweeping, Pet Waste Ordinance Fertilizer Ordinance for City Property, Yard Debris / Storm drain Ordinance
Durham	Pet Waste Ordinance, IDDE Program, Leaf Collection
Hillsborough	Collection System Inspections , Leaf Collection, Street Sweeping
Raleigh	Public Education Sanitary Sewer Overflows, Collection System Inspections , Leaf Collection, IDDE Program, Street Sweeping, Land Conservation
Roxboro	Leaf Collection
Stem	None reported
Wake Forest	Public education fertilizer application, Street Sweeping
Durham County	Voluntary Citizen Fertilizer Reduction
Franklin County	Illicit discharge detection & elimination
Granville County	Increased Septic Inspections Program
Orange County	IDDE Program, Collection System Inspections
Person County	Septic Remediation Grant Program
Wake County	IDDE Program