Path Forward Committee Meeting April 7, 2020

Remote Access Only (see next slides)

Remote Access Options

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Computers without audio capabilities, or audio that is not working	Join Microsoft Teams Meeting (888) 404-2493 Passcode: 371 817 961# **Please mute your phone** unless you want to provide input.	Follow instructions above **Turn down your computer speakers, mute your computer microphone,** and dial the toll-free number through your phone and enter the passcode
Phone only	(888) 404-2493 Passcode: 371 817 961# **Please mute your phone** unless you want to provide input.	Dial the toll-free number and enter the passcode

Remote Access Guidelines

- This meeting will open 30 minutes prior to the official meeting start time to allow users to **test equipment** and ensure communication methods are working
- If you dial in through your phone, mute your microphone and turn down your speakers to **avoid feedback**
- Unless you are speaking, please mute your computer or device microphone and phone microphone to **minimize background noise**
- UNRBA meetings are open meetings; however, for this remote access meeting, please **limit the discussion to UNRBA Board Members** to facilitate moving through action items

Agenda

- Opening comments
- Summary of UNC Collaboratory Jordan Lake Watershed Modeling, guest speaker, Jonathan Miller, UNC Collaboratory
- Status Updates
  - Forum follow-up and contract adjustments
  - Status of IAIA
  - Nutrient Trading/Offset Rule Updates
  - Modeling and Regulatory Support Status
- Other status items
- Closing comments

Summary of UNC Collaboratory Jordan Lake Watershed Modeling
Guest Speaker: Jonathan Miller

NC STATE UNIVERSITY

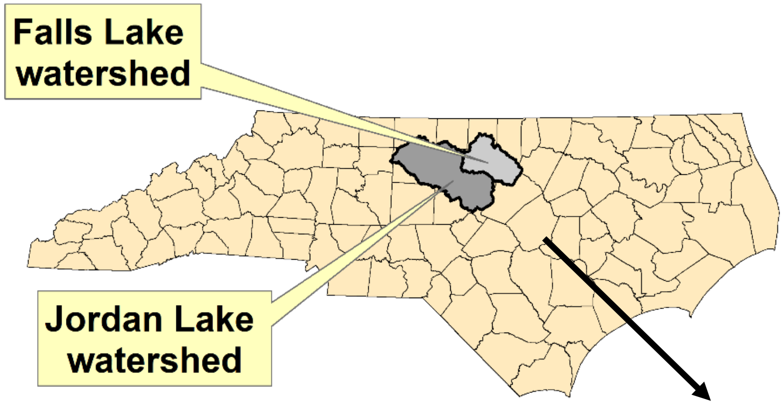
Jordan Lake Watershed Model

Jonathan Miller
Kimia Karimi
Sankar Arumugam
Dan Obenour

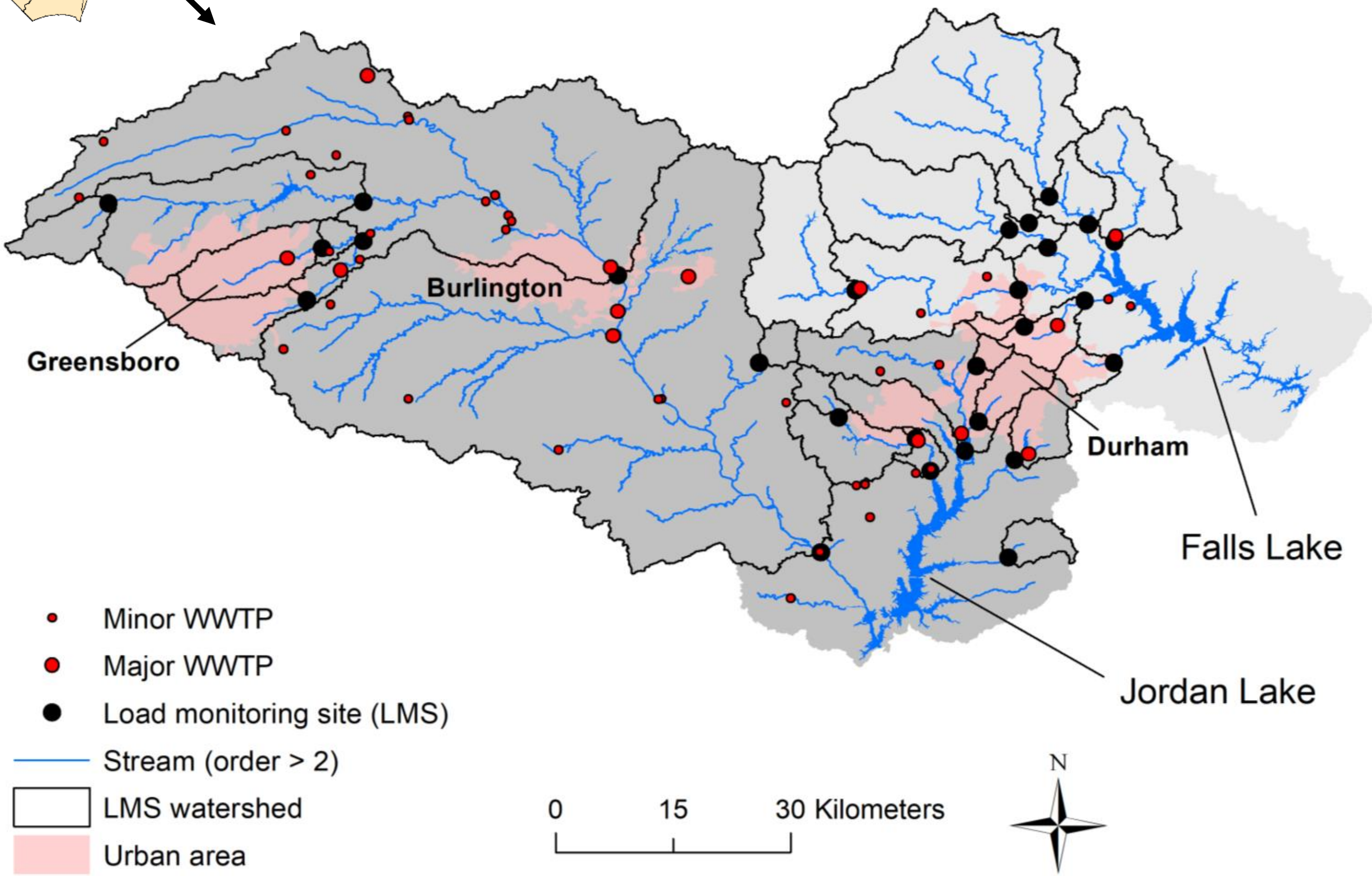
NC Policy Collaboratory

North Carolina
Upper Neuse River Basin Association
7 April 2020

Study area



Falls Lake watershed
Jordan Lake watershed



Burlington
Greensboro
Durham
Falls Lake
Jordan Lake
Minor WWTP
Major WWTP
Load monitoring site (LMS)
Stream (order > 2)
LMS watershed
Urban area
0
15
30 Kilometers
N

Research Questions

1) What are the **source allotments** of TN and TP in the watershed?

2) To what extent do **urban TN export** exceed natural and agricultural land covers?

3) Can we better **quantify intra-annual variation** due to differences in precipitation?

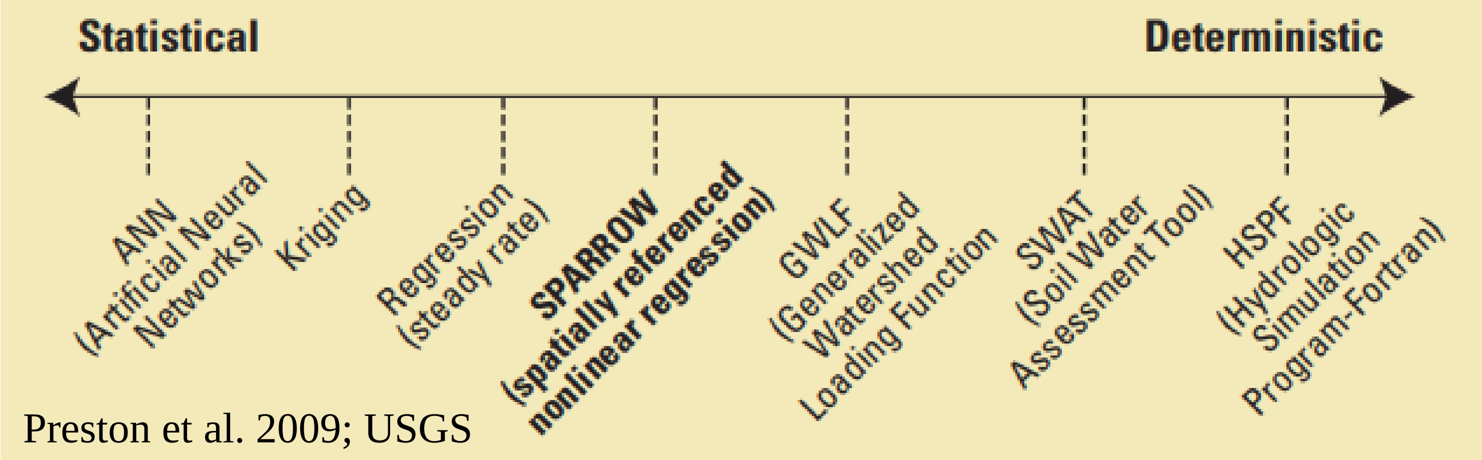
4) Are **better management practices** implemented by NC **helping to reduce** TN export?

5) What **% of TN and TP export** is reaching downstream reservoirs?

Water quality models

"This model" hybrid Bayesian watershed model

Temporal extent:	yearly	⟷	sub-daily
Spatial extent:	regional	⟷	site-specific
Model framework:	general	⟷	detailed

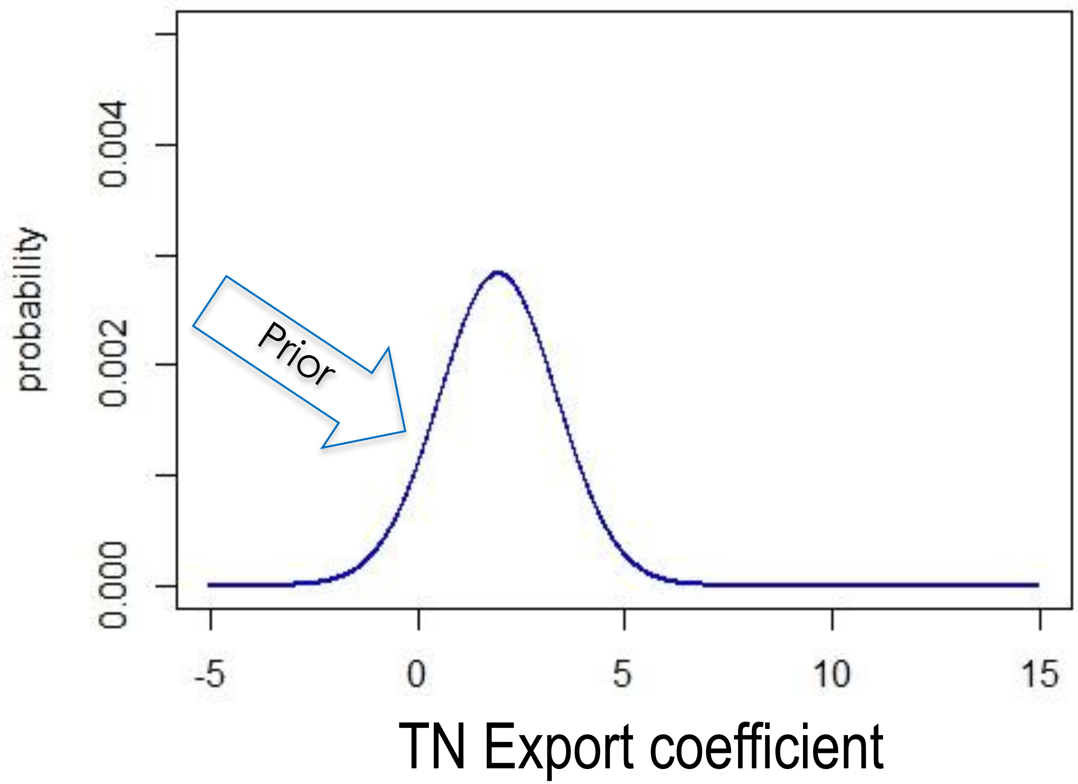


Preston et al. 2009; USGS

Mean loadings (SPARROW) vs. *yearly loadings*

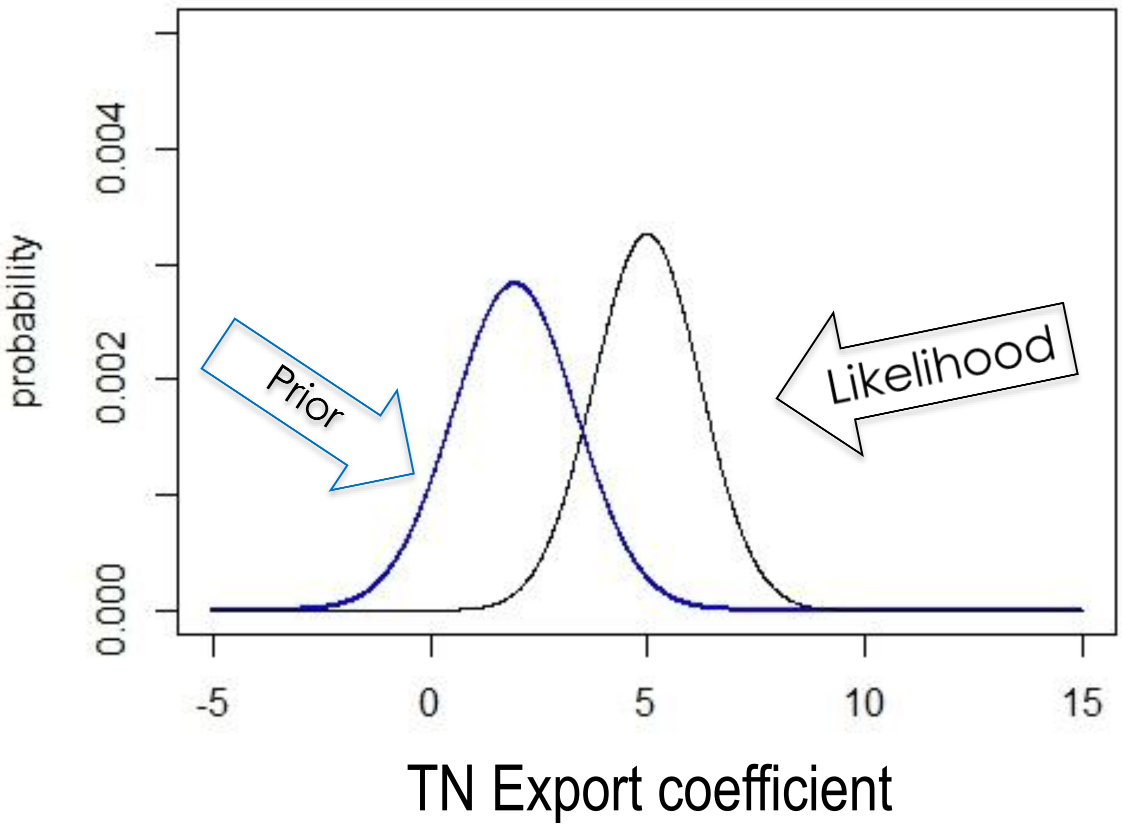
Bayesian modeling

Prior belief – distribution from prior research



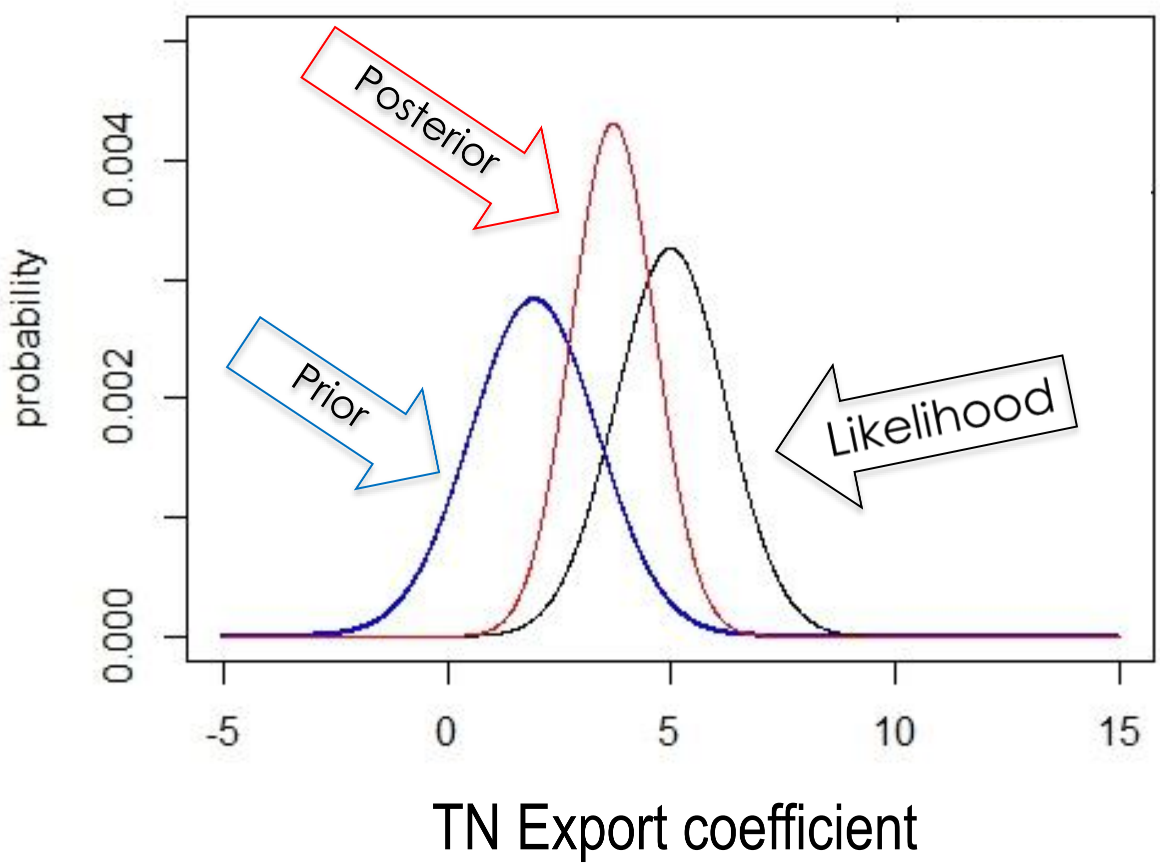
Bayesian modeling

Likelihood – distribution the data implies



Bayesian modeling

Prior belief – distribution from prior research
Likelihood – distribution the data implies
Posterior- final distribution for coefficients



Nutrient loading estimates

Yearly nutrient loading estimates

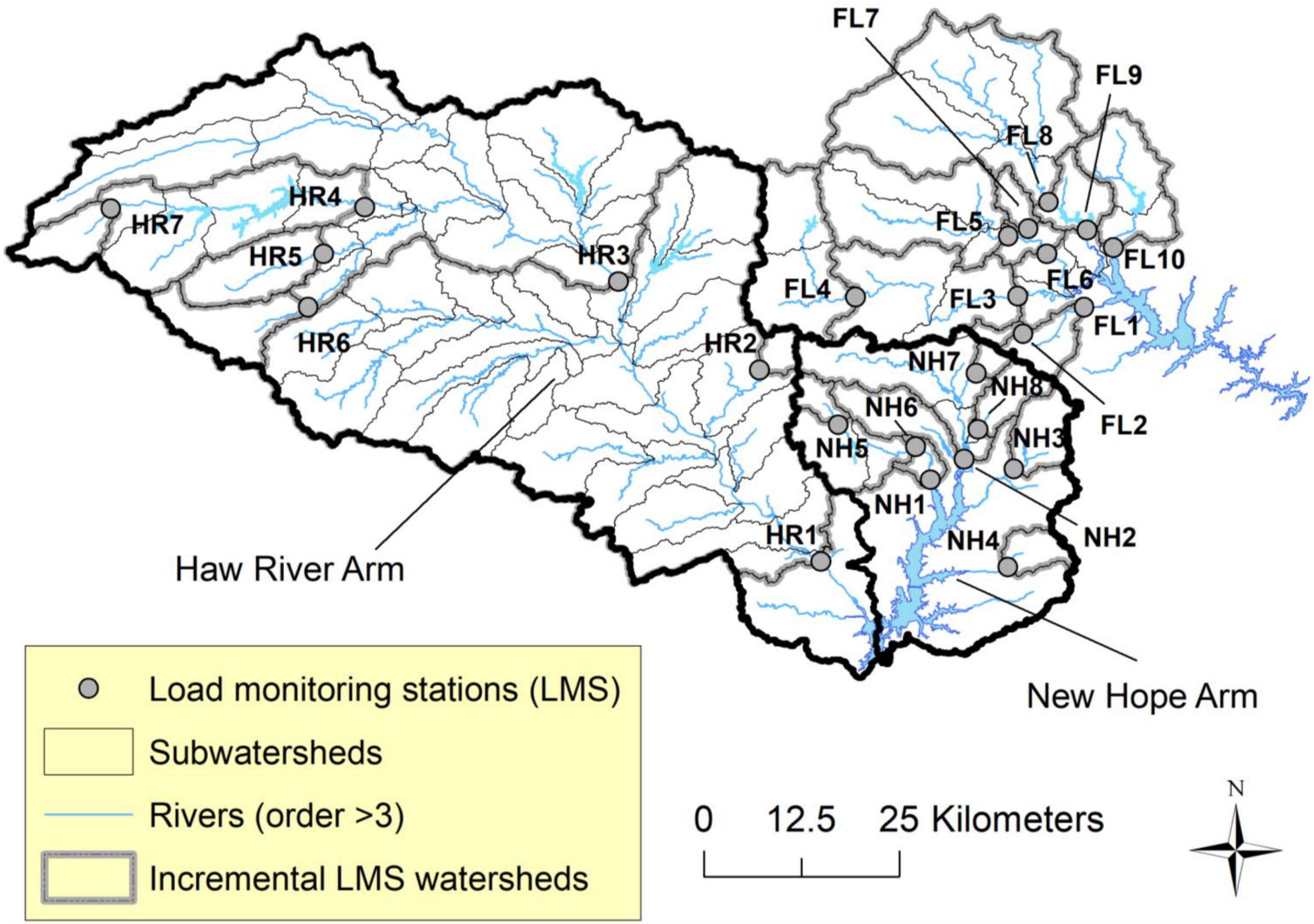
- Weighted Regression on Time, Discharge, and Season (WRTDS; *Hirsch et al. 2010)*

- Accounted for uncertainty in WRTDS estimates *(Strickling and Obenour 2018*)

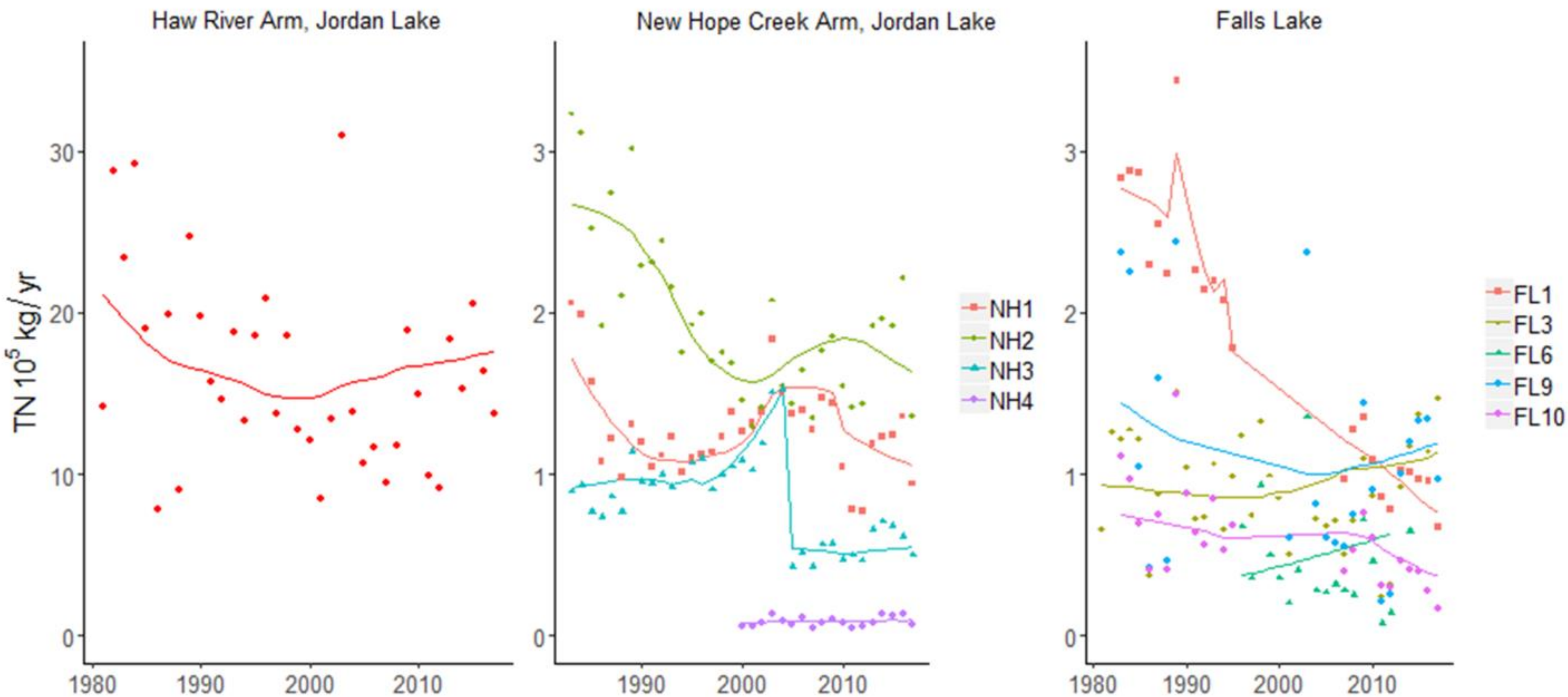
# of samples in a year ↓ Uncertainty ↑ (CV ~ 5 - 25%)

26 Load monitoring stations (1982-2017)

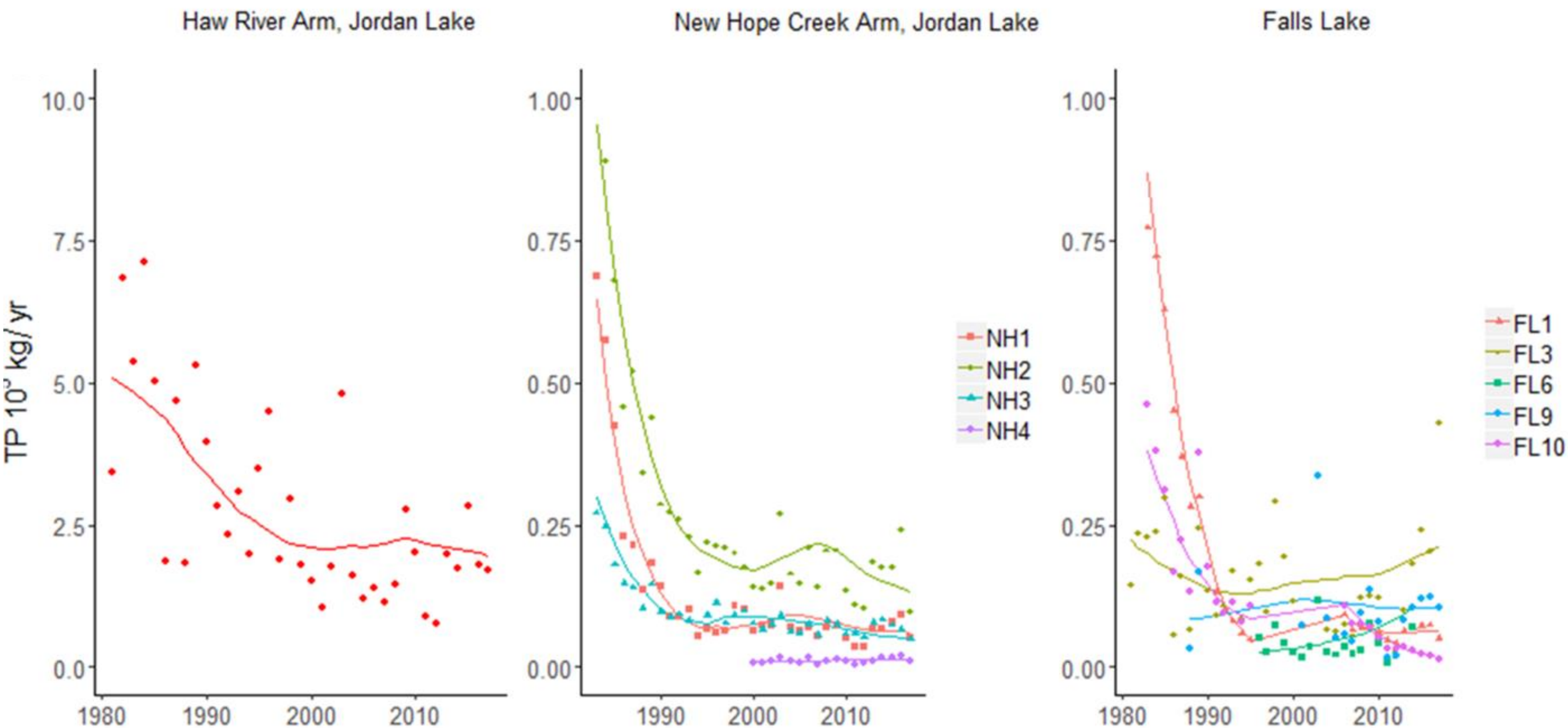
- > 5 years daily flow data
- > 50 TN/TP samples



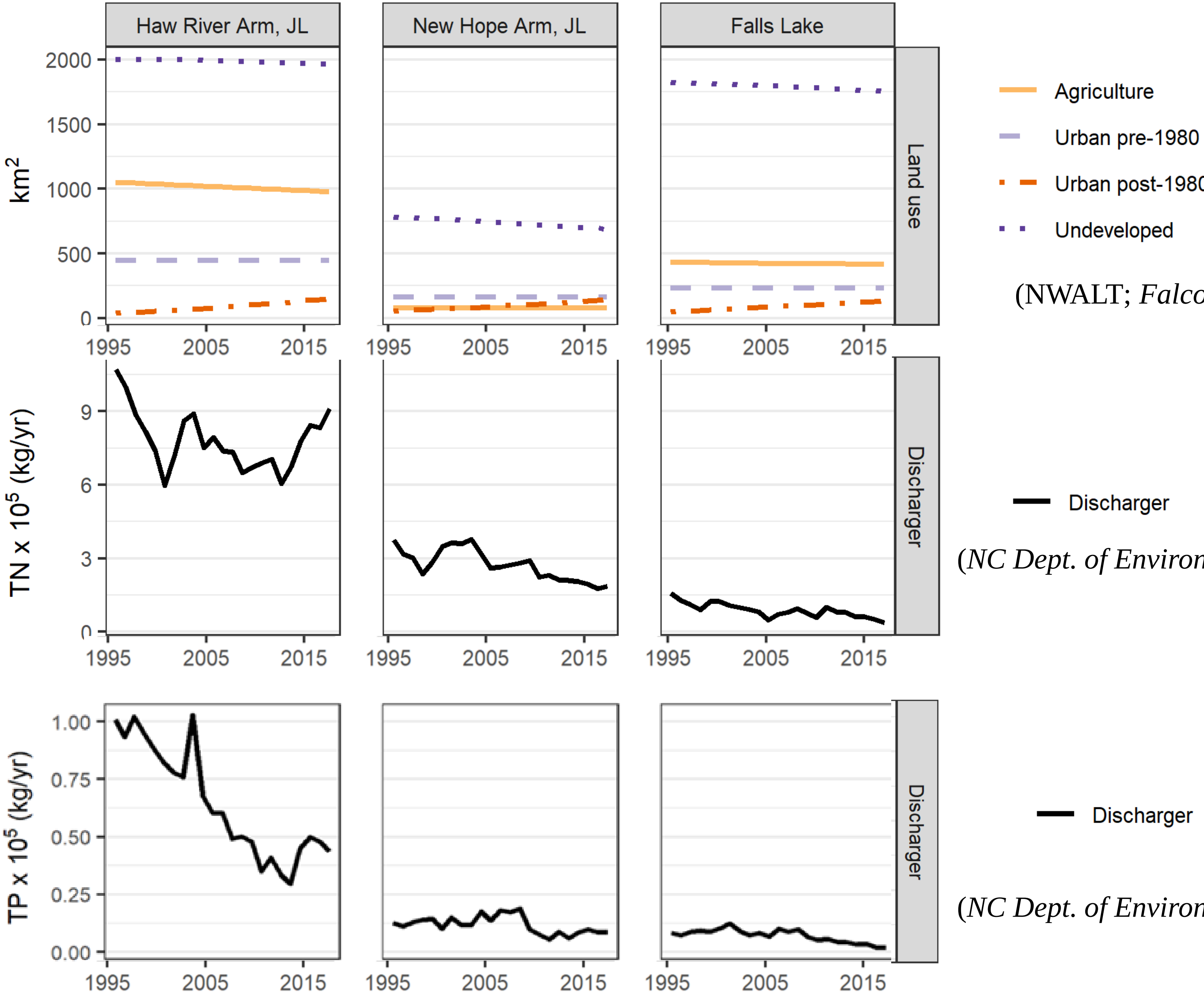
TN- Flow normalized loads



TP- Flow normalized loads



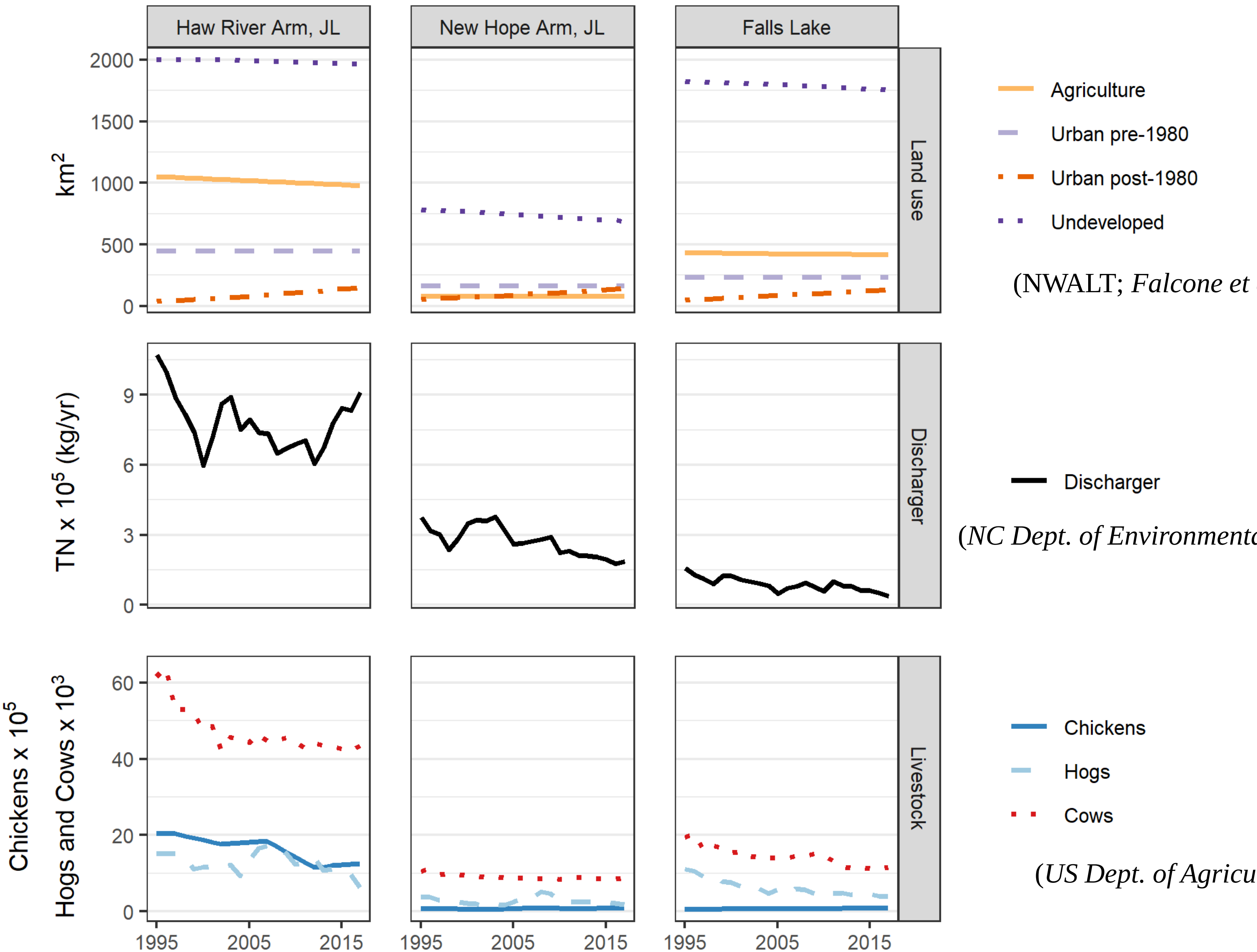
Model construction



(NWALT; *Falcone et al. 2015*)

(*NC Dept. of Environmental Quality*)

(*NC Dept. of Environmental Quality*)



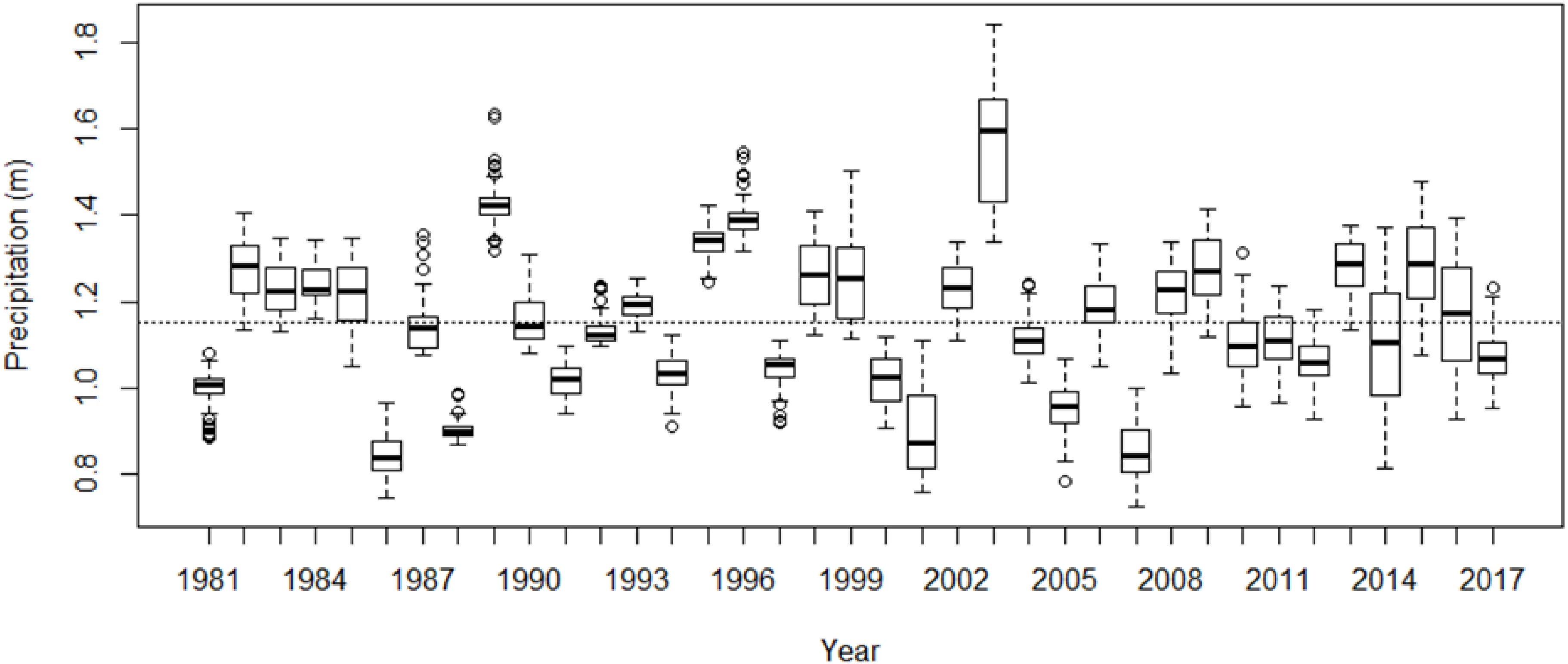
(NWALT; *Falcone et al. 2015*)

(*NC Dept. of Environmental Quality*)

(*US Dept. of Agriculture*)

Yearly precipitation

PRISM Climate Group (Oregon State)



Basic model construction

Inferred WRTDS estimates

Predicted incremental loads (from model)

$$\ln(y_{i,t}) \sim N(\ln(\hat{y}_{i,t} + \alpha_i), \sigma_\varepsilon)$$

$$\alpha_i \sim N(0, \sigma_{LMS})$$

Site random effect

Incremental loadings

(i = watershed t = year)

$$\hat{y}_{i,t} = \underbrace{L_{i,t,ur1} + L_{i,t,ur2} + L_{i,t,ag} + L_{i,t,und}} + L_{i,t,ps} + \underbrace{L_{i,t,ch} + L_{i,t,h} + L_{i,t,cw}} - U_{i,t} * r_{i,z} + \varepsilon_{i,t}$$

Land cover-
Pre-1980 Urban (ur1),
Post-1980 Urban (ur2).
Ag, Undeveloped

Dischargers-
Major and minor WWTPs

Livestock-
chickens, hogs, cows

Upstream load retention
(streams and lakes)

$$L_{i,t,x} = \beta_{ec}\,(p_{i,t}{}^{\gamma_{pic}})^{*}A_{i,t,x} * (1 - r_{i,t,x})$$

β_{ec} = **export** coefficients

Υ_{pic} = **precipitation impact** coefficients

$p_{i,t}$ = scaled precipitation

$A_{i,t,x}$ = **Area** of land cover (ha)

$r_{i,t,x}$ = Stream and lake **retention**

Results

TN/TP model

Table 3.2: Mean parameter estimates for the TN and TP models along with 95% credible intervals (CI). Units are kg/ha/yr and kg/count/yr (livestock)

		Export coefficients			
		TN		TP	
	Parameter	Mean	95% CI	Mean	95% CI
Agriculture	$\beta_{,ag}$	4.0	2.3-5.7	0.6	0.4-0.8
Pre-1980 Urban	$\beta_{,ur1}$	9.5	7.4-11.4	1.5	1.1-1.8
Post 1980 Urban	$\beta_{,ur2}$	3.9	0.7-7.3	0.6	0.03-1.4
Undeveloped	$\beta_{,und}$	0.7	0.1-1.5	0.05	0-0.13
	$\beta_{,ch}$	0.01	0-0.02	0.004	0-0.009
Livestock	$\beta_{,h}$	0.04	0.01-0.07	0.02	0-0.04
	$\beta_{,cw}$	0.5	0.1-1.0	0.16	0-0.55

Lands urbanized before 1980 are hot spots for diffuse nutrient export

Undeveloped lands export about an order of magnitude less (~10x)

TN/TP model

Table 3.2: Mean parameter estimates for the TN and TP models along with 95% credible intervals (CI).

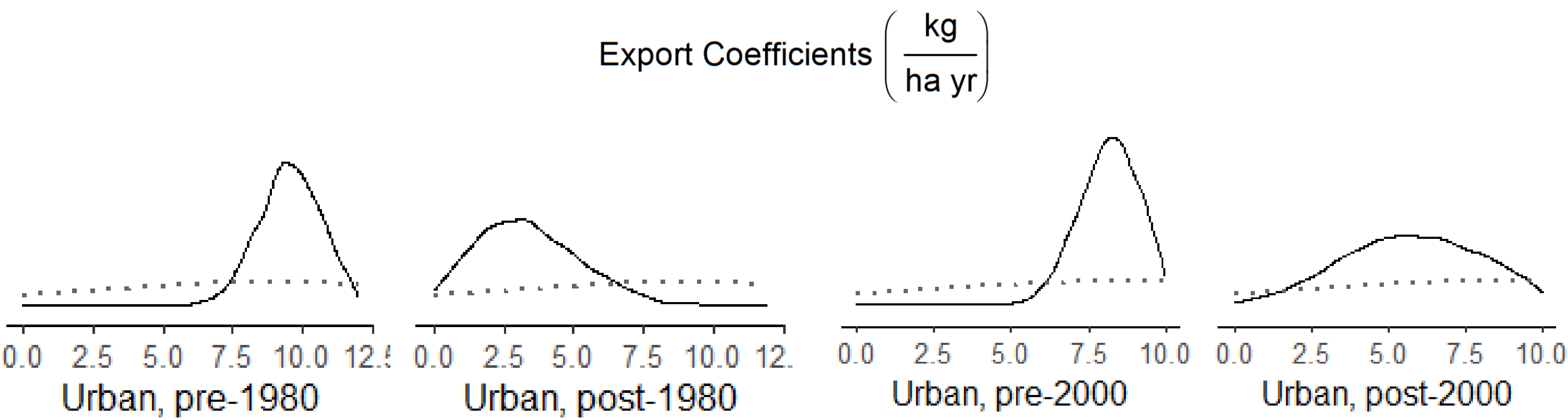
Precipitation Impact Coefficients

		TN		TP	
	Parameter	Mean	95% CI	Mean	95% CI
Agriculture	$\gamma_{,ag}$	4.1	2.9-5.0	4.0	2.9-5.1
Pre-1980 Urban	$\gamma_{,ur1}$	1.2	0.7-1.7	1.8	1.1-2.5
Post 1980 Urban	$\gamma_{,ur2}$	2.1	0.4-4.0	2.0	0.2-3.9
Undeveloped	$\gamma_{,und}$	2.8	0.6-5.2	2.4	0.5-4.5
	$\gamma_{,ch}$	1.9	0.3-3.8	2.4	0.5-4.8
Livestock	$\gamma_{,h}$	1.8	0.3-3.7	2.0	0.3-4.1
	$\gamma_{,cw}$	1.8	0.3-3.7	2.3	0.4-4.4

Agricultural lands vary the most due to precipitation.
Pre-1980 urban lands are the most constant source of nutrients

TN model- *pre-post models*

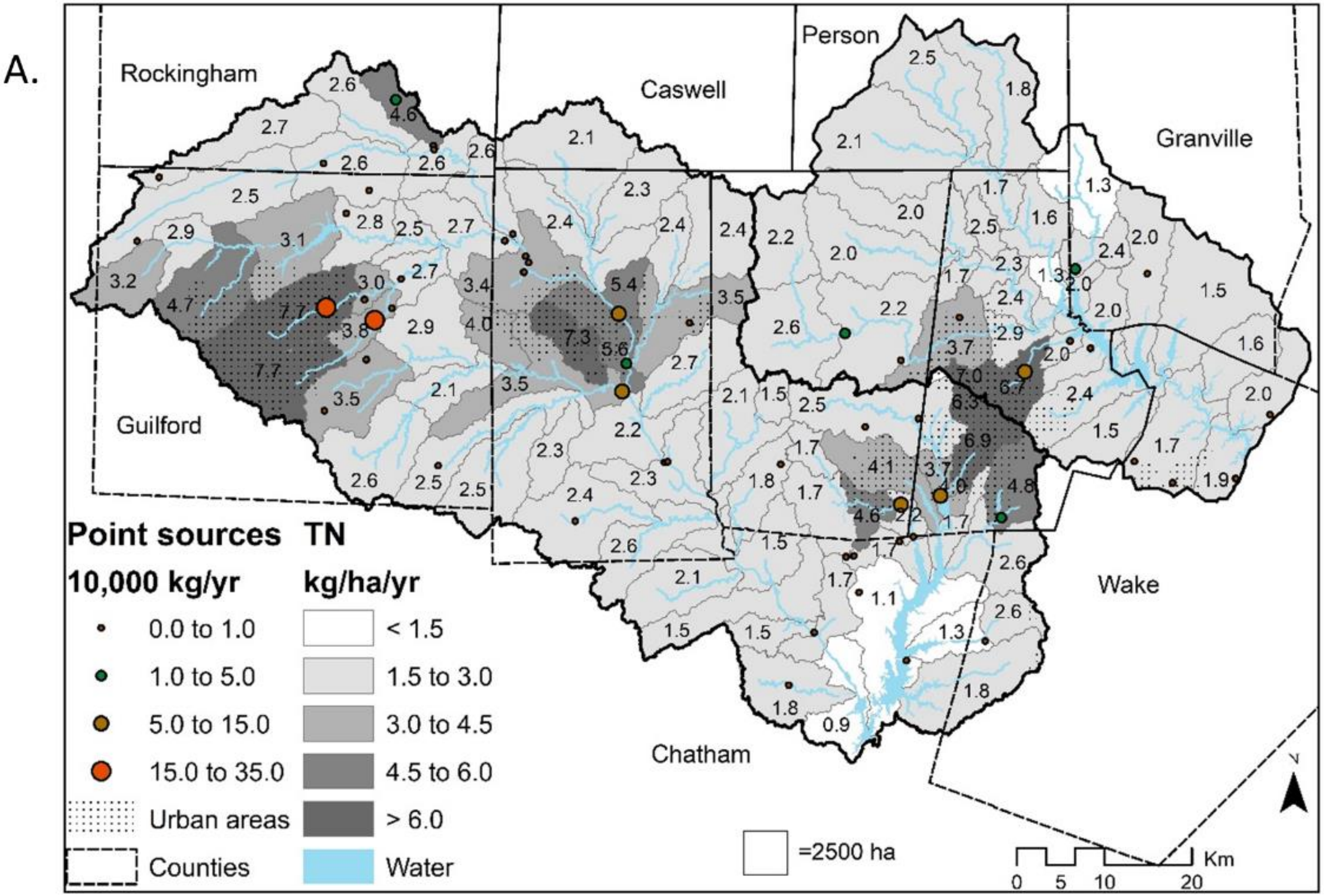
Pre/post 1980 **Pre/post 2000**



Pre > Post Export
> 99% certainty

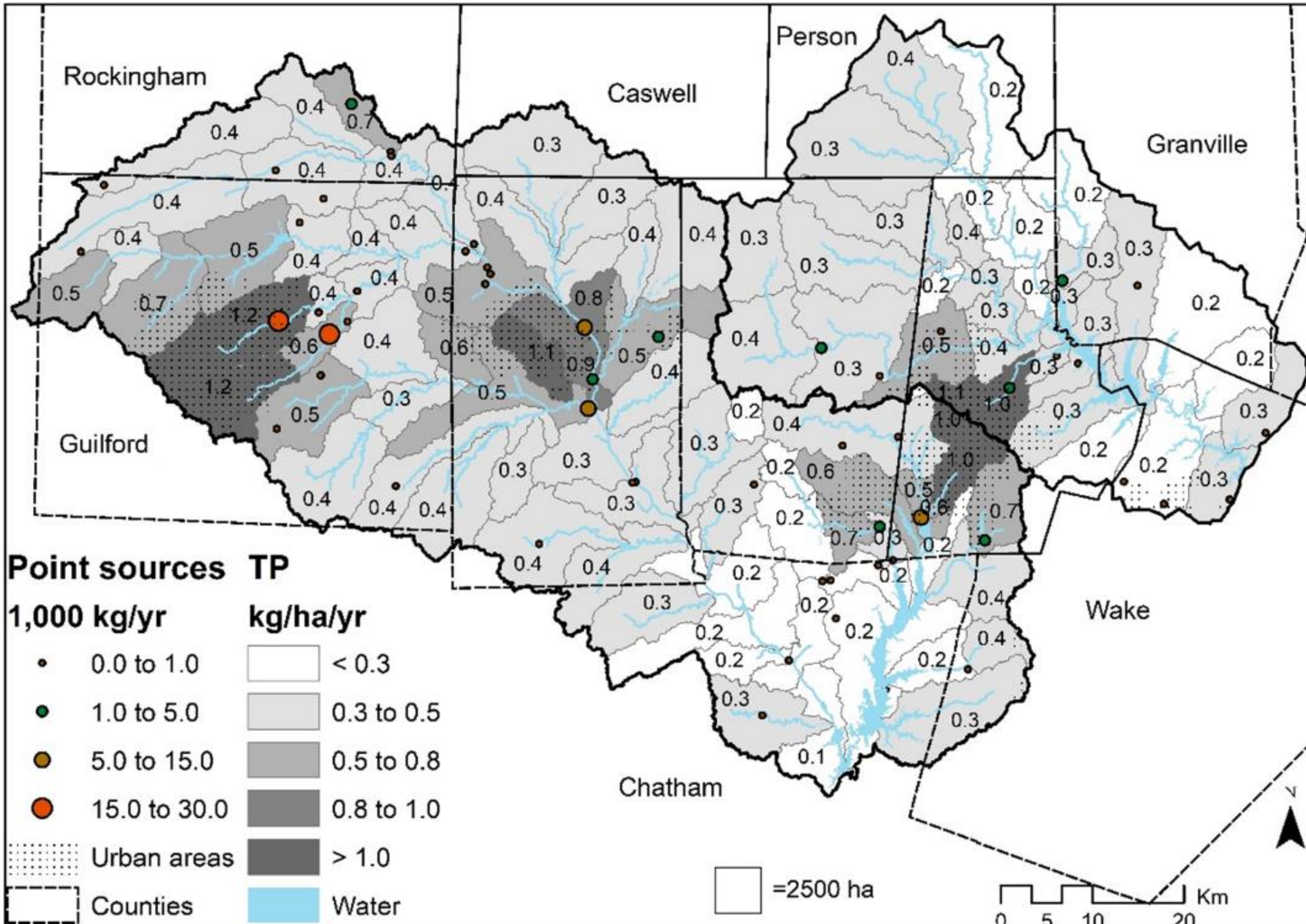
Pre > Post Export
81% certainty

TN export by subwatershed

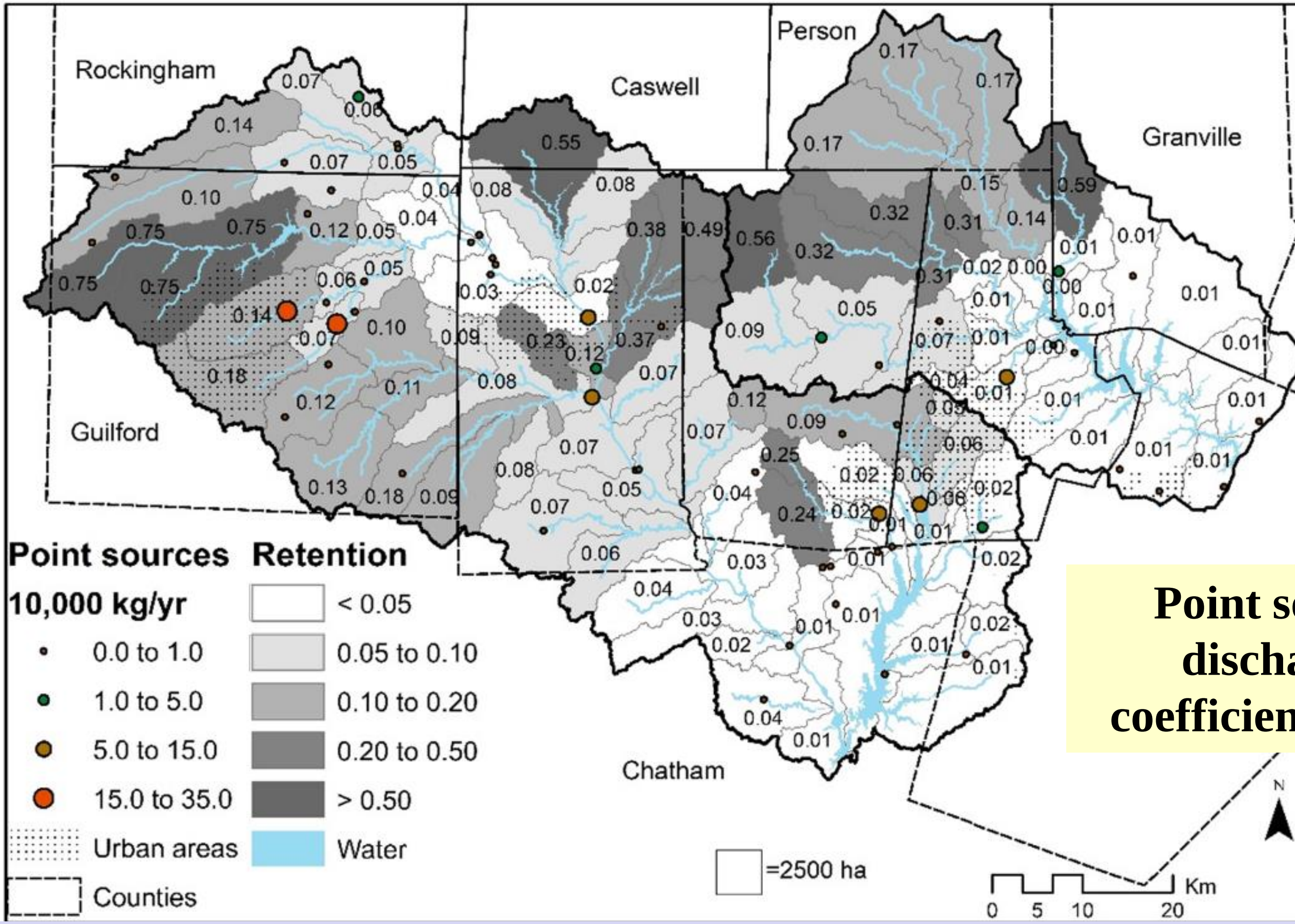


Lands urbanized before 1980 are hot spots for diffuse nutrient export

TP export by subwatershed



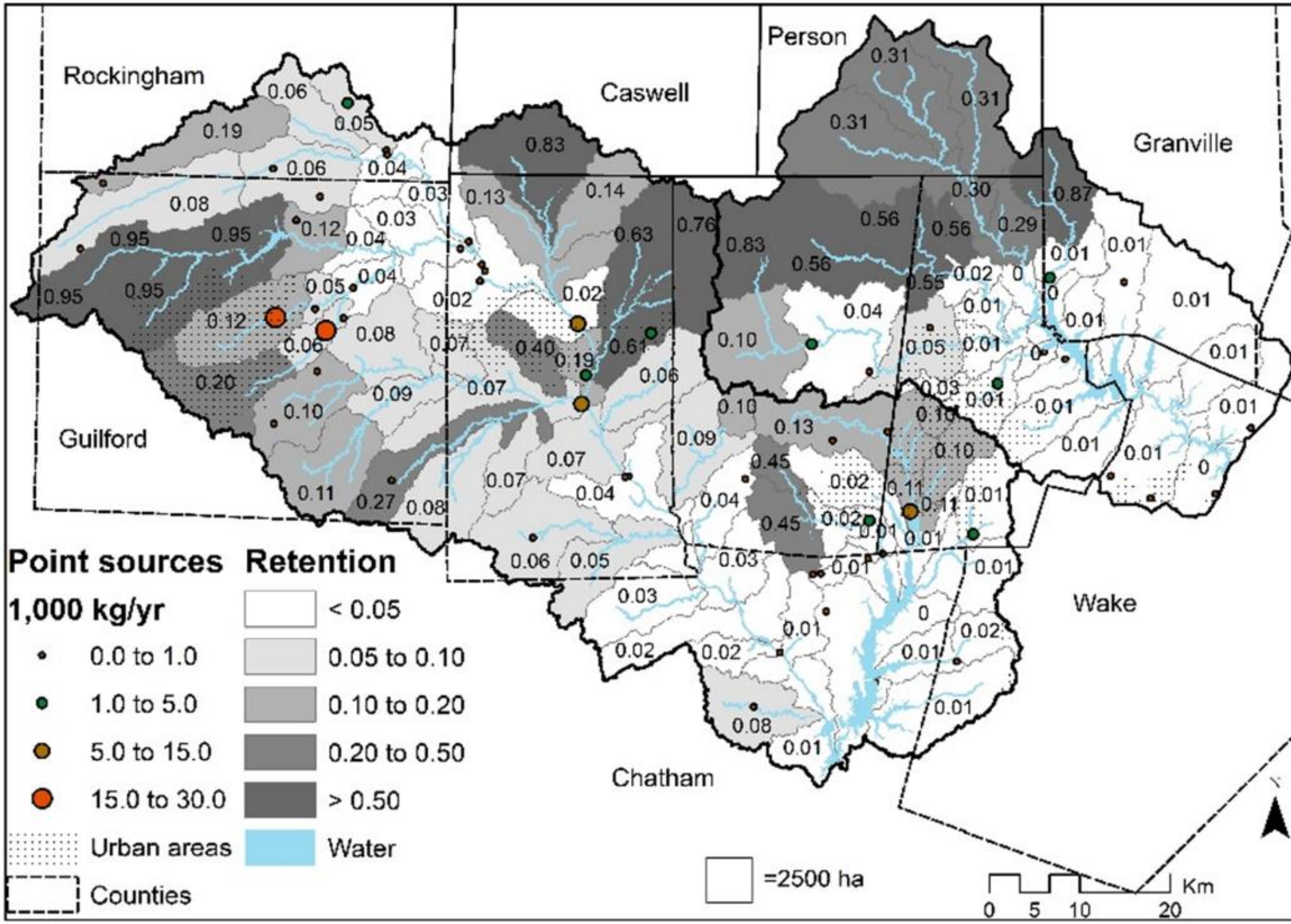
TN retention rates (***13% average***)



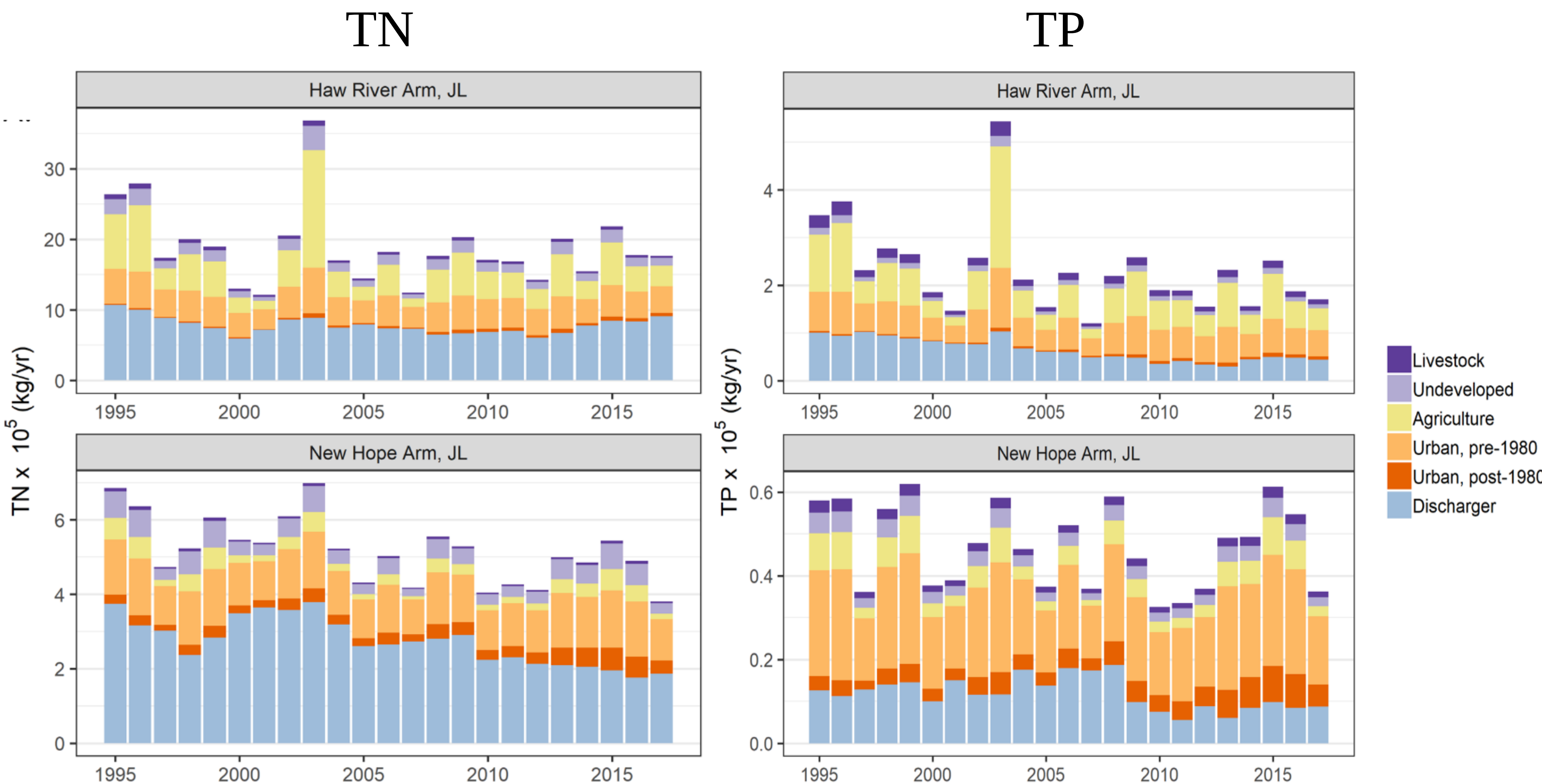
Point source discharge coefficient ~ 0.83

Majority of nutrients from northern Haw reach the reservoir (>70% for major dischargers near Greensboro)

TP retention rates (*17% average*)



Basin summary



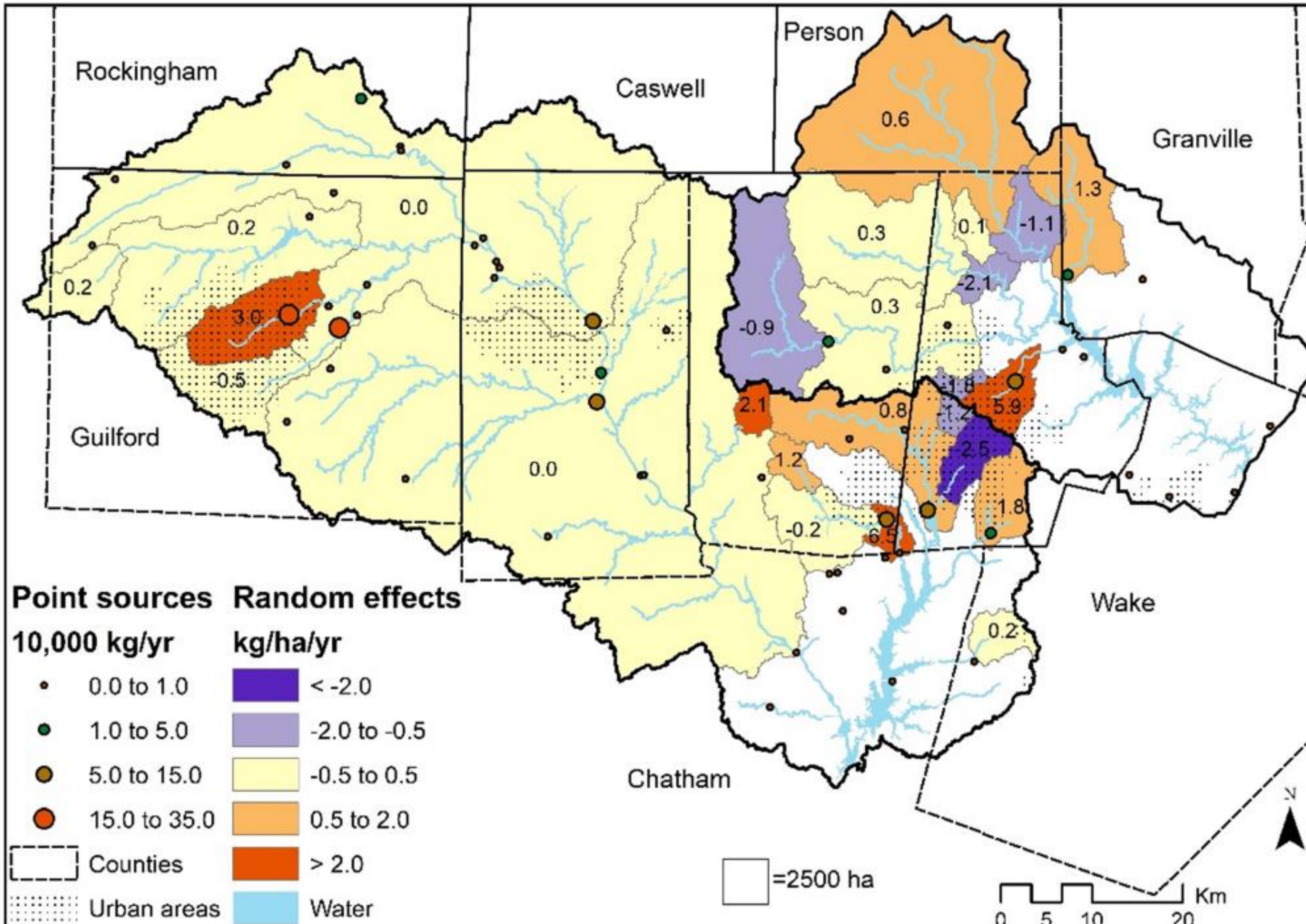
Basin summary

Table 3.4: Percent of nutrient sources that contributes to total Jordan Lake loadings from the Haw River (HR) and New Hope (NH) watersheds for normal flow years (33-67 percentile flow years). In parenthesis are the percent of each nutrient source during low flow years (lower 33%) and high flow years (upper 67%), respectively.

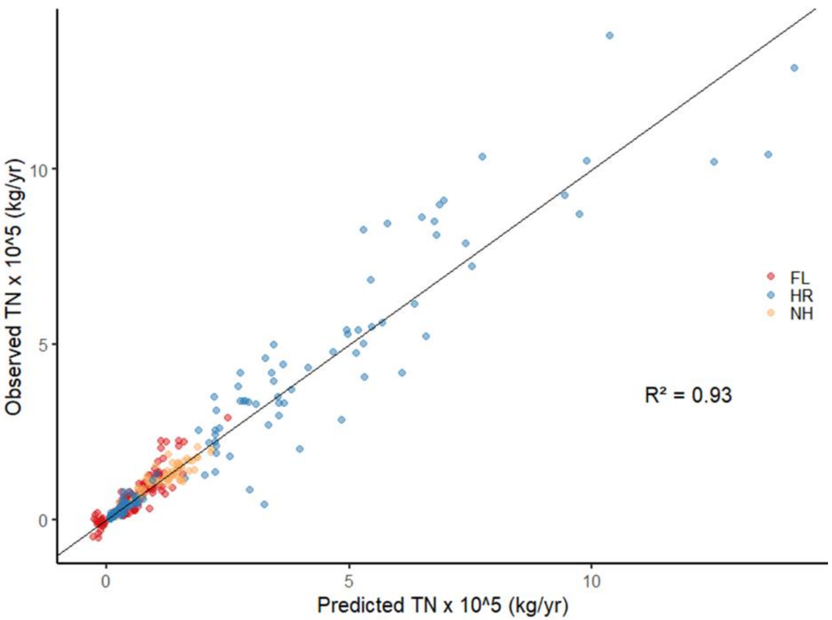
	% TN		% TP	
Nutrient source	HR	NH	HR	NH
Agriculture	17 (11,25)	1 (1,2)	24 (17,31)	2 (1,2)
Urban, pre-1980	18 (18,17)	6 (6,5)	25 (23,22)	8 (7,7)
Urban, post-1980	2 (1,1)	2 (1,1)	2 (2,2)	2 (2,1)
Undeveloped	6 (5,7)	2 (2,2)	4 (3,4)	1 (1,1)
Livestock	2 (2,2)	0 (0,0)	5 (5,6)	1 (1,1)
Discharger	33 (40,28)	11 (15,10)	21 (32,20)	5 (6,3)

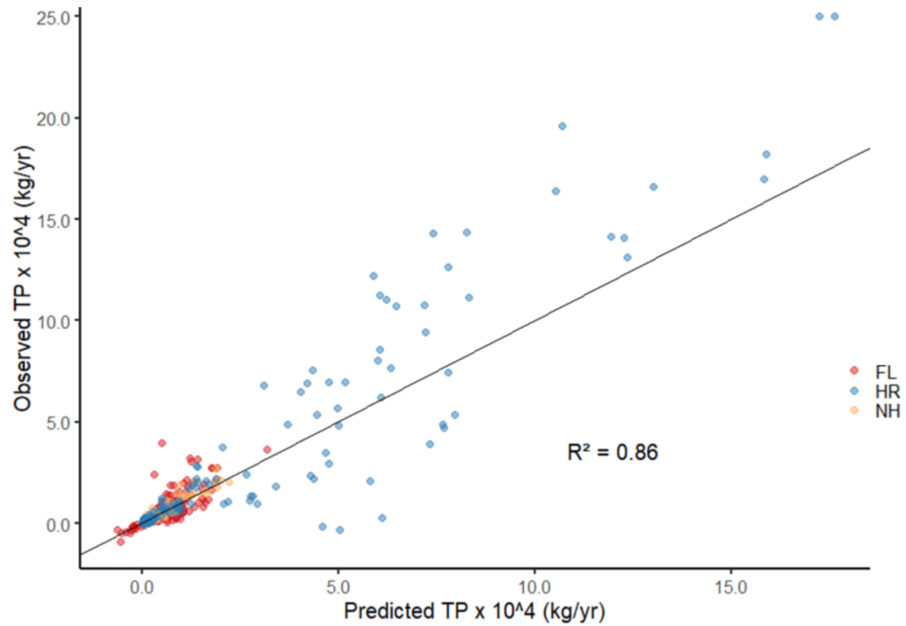
Point source dischargers make up between 38-55% of TN and 23-38% of TP loadings to Jordan Lake.

Watershed random effects



Predicted vs. Observed





Basin	TN (R^2)	TP (R^2)
Haw River	.95	.92
New Hope Creek	.92	.84
Falls Lake	.81	.62

Comparison to previous Tetra Tech model

Table 4.1: Summary of export coefficients for previous JL watershed model (Tetra Tech, 2014) and this study. Ranges for parameters represent export rates due to variations in precipitation, not the uncertainty of model parameters.

Model	Nutrient source	TN (kg/ha/yr)	TP (kg/ha/yr)
Tetra Tech (2014)	High-density residential/commercial	5.7-9.2	0.9-1.6
	Low/Medium-density residential	2.3-6.5	0.3-0.9
	Row crops	2.4-11.4	0.2-1.4
	Pasture/grassland	2.0-5.7	0.1-0.3
	Forest	1.1-3.4	0.05-0.2
Current model (2019)	Pre-1980 urban	7.4-11.6	1.0-2.0
	Post-1980 urban	2.5-5.5	0.4-0.8
	Agriculture	1.7-7.9	0.3-1.2
	Undeveloped	0.4-1.1	0.03-0.1

Summary- key points

- Point source dischargers make up nearly 50% of TN and 25% of TP loadings to Jordan Lake. Thus, loads from wastewater treatment plants remain substantial in comparison to diffuse (nonpoint) loads from the landscape.

- Lands urbanized before 1980 are hot spots for diffuse nutrient export. They release more than double the TN and TP of agricultural and post-1980 urban lands (per unit area).

- Undeveloped lands export about an order of magnitude (~10x) less TN and TP than agricultural and urban lands (per unit area). Thus, development of natural lands will substantially increase nutrient loading to Jordan Lake.

- Nutrient retention in watershed steams and waterbodies is less than 20% of total point and nonpoint loads, except where TP is intercepted by reservoirs with long residence times. As a result, most of the load from the upstream portions of the watershed (e.g., Triad area) reaches Jordan Lake.

Acknowledgements

NC Department of Environmental Quality (NC DEQ)

Members of Dan Obenour's NCSU Lab Group
(Environmental Modeling to Support Management and Forecasting)

Alexey, Shiqi, and Dario

Adjustments to HDR and BC Contracts to Support Communications

Adjustments for Communications Contracts

- The February 12, 2020 Falls Lake Regulatory Forum was successful but required more coordination and work than was planned
- Follow-up activities are also needed to maintain momentum and respond to participants
- HDR Communications contract modification
  - Additional expenses
  - Compilation of work products
- Modeling and Regulatory Support contract modification
  - Additional expenses
  - Targeted meeting follow up
- Request to the Board: Modifications would be covered under the current fiscal year's communication support budget of $40,000, not to exceed a total of $20,000—leaving $20,000 for current FY

Status of Contract Modifications

- On March 18, 2020, the UNRBA Board
  - Approved contract modifications up to $20,000 in total for the HDR and MRS contracts.
  - Authorized the Executive Director to develop the necessary contract modifications, with the understanding that the total of both modifications would not exceed $20,000
  - Authorized the Chair to execute these modifications on behalf of the UNRBA
- The Executive Director is working with the contractors to develop the contract modifications

Status of the Interim Alternative Implementation Approach (IAIA)

Status of the UNRBA Stage I Existing Development Interim Alternative Implementation Approach (IAIA)

- DWR provided draft Model Program language for review on March 4th
- UNRBA provided comments and proposed edits on March 9th highlighting the context of the January 24th discussion (summarized in the February PFC meeting slides)
- UNRBA discussed initial draft with DWR on March 13th
- DWR indicated the initial draft was intended to align with the January 24th discussion
- Group discussed language that was unclear with respect to requirements under an IAIA
- DWR revising the draft for UNRBA and NGO review
- Timing is critical--if implementation is to begin on July 1, 2021 the schedule developed will have to be met

Prospective Development Schedule for UNRBA IAIA Program Implemented under the Falls Lake existing rules. Potential start date of July 1, 2021.

Feb 2020: DWR provides draft language in the Falls Lake Existing Development Model Program to allow an IAIA

UNRBA and members review and provide comments.

Mar and Apr 2020:

UNRBA develops draft IAIA Program including investment levels, reporting requirements, etc.

Apr 2020: Meeting with DEQ leadership to discuss IAIA and impacts on other practices like land conservation

May 2020: Internal review of UNRBA IAIA

Develop revised draft for external review; provide status presentation to UNRBA Board

June 2020: DWR reviews UNRBA IAIA Program document

July 2020: DWR provides a revised draft Model Program for UNRBA review

August 2020: UNRBA reviews DWR Model Program and finalizes IAIA Program

Sep 2020: DWR finalizes draft Model Program

Presentation of IAIA Program to UNRBA Board; DWR/UNRBA information update to EMC WQC

Oct 2020: Prepare for UNRBA/DWR/NGO presentation to EMC WQ Committee

Nov 2020: UNRBA Board action to submit, or not, to the EMC for approval in January

Present Model Program with IAIA to EMC WQ Committee; DWR information update to full EMC

Jan 2021: Model Program submittal to full EMC for approval

July 2021: Submit and begin implementation of either the IAIA (with signatures of participants) or individual jurisdictions submit their own Local Programs

Nutrient Trading/Offset Rule Updates

Nutrient Trading/Offset Rule Updates

- UNRBA filed letter with the Rules Review Commission about specific differences in material components of trading—requested revision—RRC concurred
- DWR's proposal was to carve out two exceptions in the rules to be resubmitted to the RRC: one for Falls Lake that would reference back to 0282 and one for Jordan Lake.
- Modifications developed through coordination with DWR and EMC
- Submitted to EMC on March 18th and Approved
- Submitted to RRC on March 19th and Approved
- John Huisman confirmed that DWR has submitted a request to the Rule Codifier to change the reference in the Falls trading provisions to the newly codified rule .0703—allowing nutrient trades in Falls to follow the procedural provisions of the newly adopted rule

Modeling and Regulatory Support (MRS) Status

Watershed Modeling Status

- The Modeling Team presented preliminary hydrologic calibration and validation results to the MRSW on February 4th
- Model performance generally ranks Good to Very Good at locations with observed USGS flow data
- Model performs within expected ranges at ungaged tributaries
  - Using the basin proration method developed for the monitoring program, all but three tributaries generated total volumes, peak flows, and high flows within +-20% of the expected flow
  - These three drainages (Lick, Little Lick, and Panther Creeks)
    - May be more similar to upper Ellerbe Creek
    - Comprise 3.5 percent of the total drainage area
- Distribution of land use data for the recent modeling period
  - Distributed on April 3rd following review by NC Departments of Agriculture and Transportation
  - Data sources and assumptions reviewed at January MRSW meeting

Comparison of Simulated Flow to <u>Estimated</u> Flow using the <u>Original Basin Proration Method</u> for the Monitoring Program

Statistic	Beaverdam	Robertson	Ledge	Smith
Total Volume	-8%	5%	-18%	-11%
Peak Flow	-22%	-13%	-19%	-16%
High Flow	-10%	-1%	-20%	-13%
Statistic	**Newlight**	**Horse**	**Honeycutt**	**Low. Barton**
Total Volume	-7%	10%	20%	20%
Peak Flow	-16%	-10%	-3%	-1%
High Flow	-9%	1%	7%	9%
Statistic	**Upp. Barton**	**Lick**	**Little Lick**	**Panther**
Total Volume	20%	28%	43%	25%
Peak Flow	-3%	-2%	9%	-2%
High Flow	13%	20%	33%	16%

- All but three of the lake loading stations (in blue) have simulated flows within 20% of those predicted based on flows observed on Flat River above Lake Michie, Eno River at Hillsborough, Eno River near Durham, Little River above Reservoir, Mountain Creek, and Tar River near Tar River.
- The three (in gray) that are not within 20% may be more similar to the Ellerbe Creek watershed than those gages included in the flow estimation (Triassic Basin soils and urban development would be expected to generate higher volumes of flow).

Comparison of Simulated Flow to Estimates Based on either the Ellerbe Creek Upstream Gage or the Original Basin Proration Method at Three Unmonitored Locations

Statistic		Lick	Little Lick	Panther
Total Volume	Using donor gages from original basin proration method	28%	43%	25%
Peak Flow		-2%	9%	-2%
High Flow		20%	33%	16%
Statistic	Using upper Ellerbe Creek gage as the only donor gage	**Lick**	**Little Lick**	**Panther**
Total Volume		-11%	0%	-13%
Peak Flow		-54%	-49%	-56%
High Flow		-16%	-6%	-16%

- When we change the donor gage(s), some statistics improve, some get worse, and some change sign (higher or lower than those predicted)
- Total volumes and high flows (flows over 50th percentile) are best predicted by the Ellerbe gage (within 16 percent) while peak flows (flows over 90th percentile) are best predicted by the original set of donor gages (within 9 percent)
- Peak flows (90th percentile) at these three sites are relatively small; e.g., at Panther Creek is 5.6 cfs; under predicting that flow during high flow conditions by 56 percent a difference of 3.0 cfs. 90th percentile flows at the big five total 847 cfs
- These comparisons are based on estimates, not measurements, and uncertainty in these unmonitored tributaries will not affect the lake model

Preliminary Watershed Temperature Calibration

- Dynamic Solutions requires both flow and temperature output from the WARMF watershed model to calibrate the EFDC hydrodynamic lake model (water level and temperature)
- Systech Water Resources performed a preliminary calibration for temperature for the most downstream locations on the tributaries to Falls Lake
  - Water quality calibration (sediment, chlorophyll-a, etc.) will impact simulated temperatures
  - Final calibration of temperature will occur in FY2021 along with water quality calibration

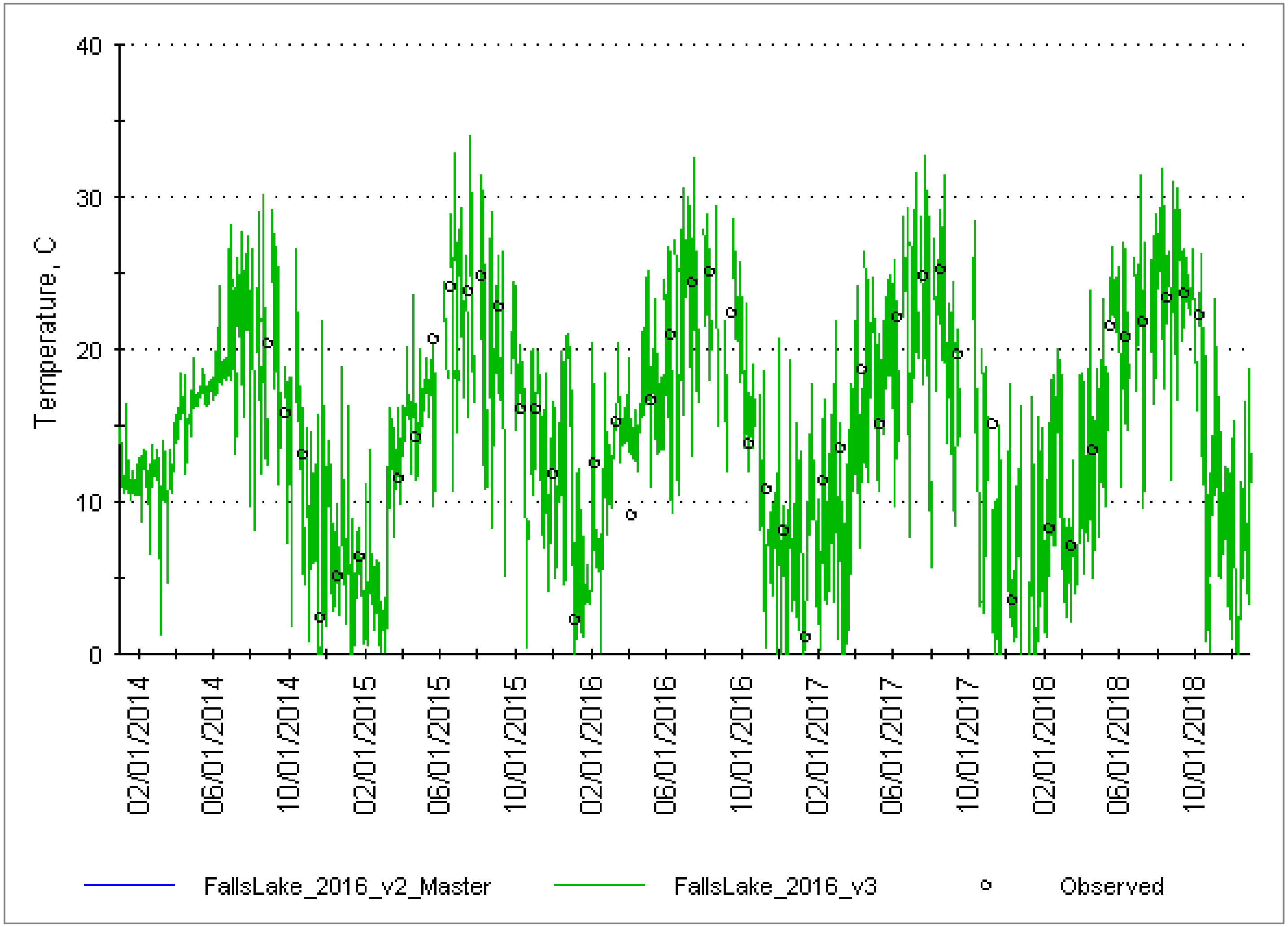
Performance Criteria for Temperature

- Performance criteria for temperature are included in the UNRBA Modeling Quality Assurance Project Plan

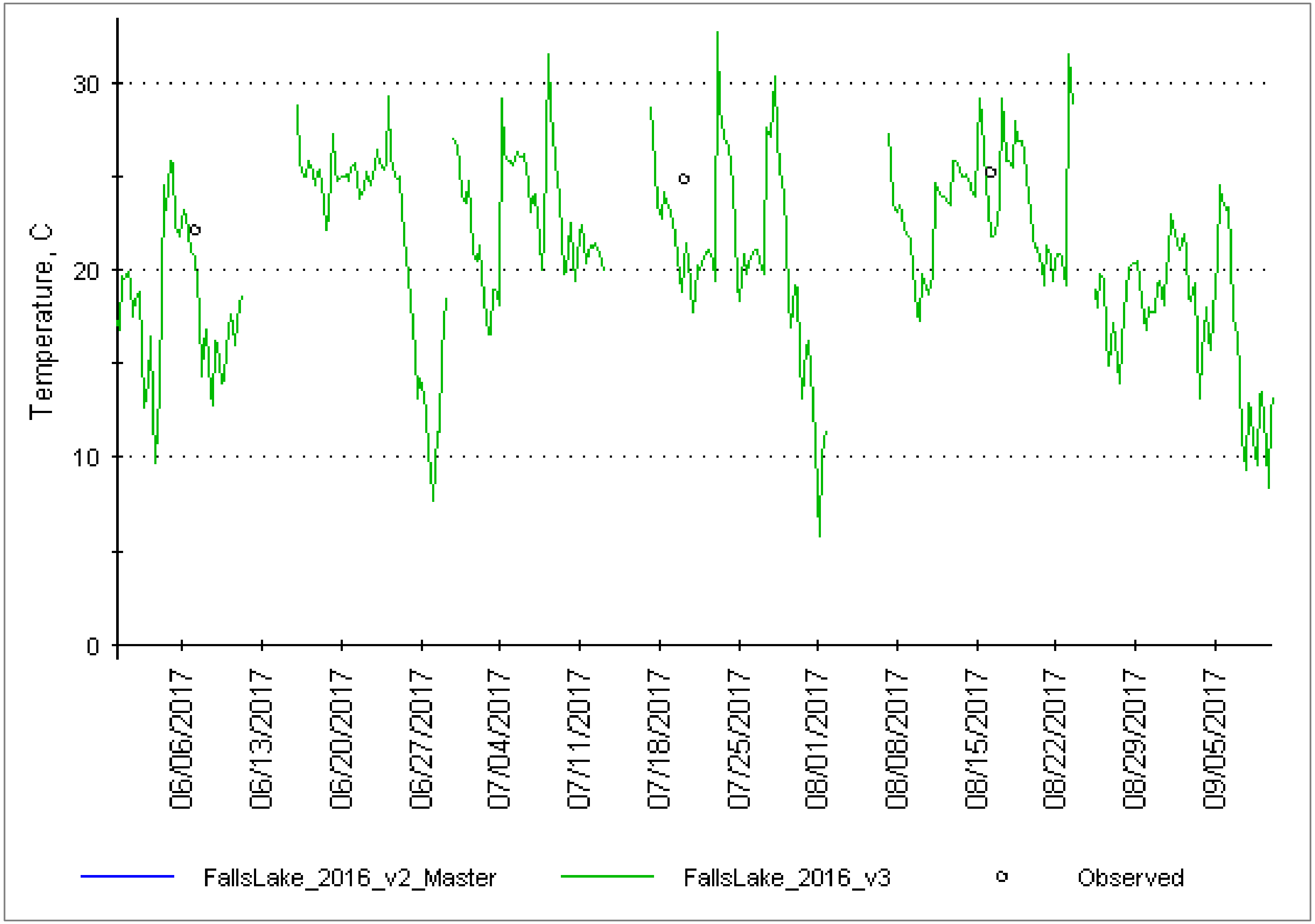
Parameter	% Difference Criteria		
	Very Good	Good	Fair
Water Temperature	< ± 7	± 8-12	± 13-18

- Preliminary temperature calibration for all seasons as well as each season evaluated individually result in
  - 183 “very good”
  - 10 “good”
  - 1 “fair” for the summer season at Lick Creek which were 13.5 percent low (fair range is 13 to 18 percent); see next slide for graphic display of results at this location

Simulated Versus Observed Temperature at Lick Creek: 2014 to 2018



Simulated Versus Observed Temperature at Lick Creek: Summer 2017



319 Grant Status

- UNRBA 319 application to support revisions to watershed model code for onsite wastewater treatment systems has been submitted to DWR.
  - Discussion with DWR and UNC Collaboratory researches on February 24th
  - UNRBA 319 application will move forward in the application process
  - ECU researchers' application will be revised to provide some additional monitoring and be resubmitted

Key Findings from State Regulations Chlorophyll-a Standards and the 303(d) Assessment Process for Lakes

Chlorophyll-a Water Quality Standards – Falls Lake

- 2008 Falls Lake Listed on 303(d) List – chlorophyll-a
  TMDL or Management Strategy Required
  Falls Lake Rules and Regulations – Phase I, Phase II
- Monitoring data indicate the possibility of non-attainment of chlorophyll-a standards in upper reservoir regardless of management strategies. (Morphology, Depth, Retention time, Light, Sediments)
- Modeling tools under development will allow testing of management scenarios and will further evaluate standards attainment

The Falls Lake Re-examination Effort Needs to Consider…

- A Site Specific chlorophyll-a standard for the Lake
- Segment Specific chlorophyll-a standards
- Compliance definitions
- Non-attainment conditions
- Reclassification of Different Segments
- Alternative approaches for evaluating and sustaining the designated uses.

- ❑ **These actions may require changes to NC's water quality standards and the Falls Lake 303(d) assessment**
- ❑ **EPA will need to approve / accept any changes**

Thus, review Chlorophyll-a WQS and 303(d) process in other states that <u>have been approved by EPA.</u>
When - In concert with development of Falls Lake models

Other States Nutrient and Chlorophyll-a Water Quality Standards – 303(d) decisions
Important Questions

What are the chlorophyll-a standards in other states?

What are the listing methods for 303(d) waters?

Are waters impaired or just water quality limited?

- Impaired Designated Uses
- WQ Standards not attained
- Antidegradation

EPA has oversight of this process –

Yet no consistency - No Two states are alike

In actuality, chlorophyll-a Water Quality Standards and 303(d) waters are very different in different states.

Regulations Chlorophyll-a Standards and the 303(d) Assessment Process (50 States)

- Review every EPA Region IV state and all states with at least partial criteria for Chlorophyll-a
- Nationwide, NC is the only state with chlorophyll a criteria "not to exceed" with a 303(d) 10% frequency
- EPA - only 2 states with chlorophyll-a water quality criteria for all waters including estuaries, lakes, rivers, and streams
  - North Carolina and Oregon.

But there is more to this story…

State Regulations Chlorophyll-a Standards and the 303(d) Assessment Process

Preliminary Observations (50 states)

- 29 States no numeric standards for chlorophyll-a
- 21 States have at least partial chlorophyll-a standards
- Goal: Review all states with at least partial standards for chlorophyll-a and also review 303(d) listing policies

Preliminary Observations EPA Region IV States

- EPA Region IV states GA, NC, SC, FL, AL, KY, MS, TN
- MS, KY, TN - no numeric criteria for chlorophyll-a*

*TN has 1 lake w/ site specific criteria - Pickwick Reservoir border lake with AL. Alabama established numeric criteria for chlorophyll-a mean April-Sept 18 μg/L at dam fore-bay.

State Regulations Chlorophyll-a Standards and the 303(d) Assessment Process

Preliminary Observations EPA Region IV States

Alabama

- Site specific chlorophyll standards for 39 Reservoirs.
- 303(d) chlorophyll-*a* criterion has been exceeded in two years during the assessment cycle and extreme hydrological events are not included (droughts, floods).

Georgia

- 6 major lakes have site-specific chlorophyll-a
- Growing season average at dam, fore bay, or intake
- Exceed average no more than once in a five-year period

South Carolina

- Chlorophyll-a piedmont / coastal ecoregion 40 ug/L
- 303(d) criterion is exceeded in more than 25% of samples
- 303(d) between 10% and 25% further site specific evaluation is necessary to determine if violations indicate actual aquatic life use impairment.

State Regulations Chlorophyll-a Standards and the 303(d) Assessment Process

Preliminary Observations EPA Region IV States

Florida is complicated

- Chlorophyll-a based on relative color (platinum cobalt)
- Annual geometric mean varies from 6ug/L to 20 ug/L.
- Numerical criteria for both N and P.
- Not to be exceeded more than once in any 3 year period.
- At least 4 temporally-independent samples/Yr with at least 1 sample taken between May and September and at least 1 sample taken during the other months of the calendar year.
- If annual geometric mean chlorophyll-a does not exceed criteria, then TN and TP meet criteria
- 3 Site Specific Alternative Criteria options.
- For lakes, chlorophyll-*a* levels, algal mats or blooms must indicate that there is not an imbalance in flora or fauna; and, at least two temporally independent Lake Vegetative Indices have an average score of 43 or above.

State Regulations Chlorophyll-a Standards and the 303(d) Assessment Process

Preliminary Observations States Outside EPA Region IV

AZ, CA, CO, KS, MD, MO, MN, NE, NV, NJ, OK, OR, TX, VA, WV

- Most States evaluate criteria based on averages, growing season, annual mean, etc.
- Most states have site specific criteria or provide for site specific
- Some states exclude extreme hydrological events
- States Designated Uses associated with chlorophyll-a criteria are different in different states – some are aesthetics, some are fish and wildlife, some are water supply.
- States evaluate Chlorophyll-a criteria at different locations – at the dam, at a bridge, lake wide average, tributaries separate
- Chlorophyll-a Criteria based on a long-term average (12 years)
- Some evaluate chlorophyll-a but only if impacts to designated uses

State Regulations Chlorophyll-a Standards and the 303(d) Assessment Process

And now the rest of the story…

EPA – only two states w/state-wide chlorophyll-a criteria for all waters.

Oregon

Chlorophyll-a lake values are actually screening values

- Minimum 3 samples collected over any 3 consecutive months at a minimum of one representative location (e.g., <u>above the deepest point of a lake or reservoir</u>)
- If values are exceeded, <u>studies may be conducted</u> to determine the impacts on beneficial uses and to develop a proposed control strategy for attaining compliance where technically and economically practicable.
- Where natural conditions are responsible for exceedance of the chlorophyll-a values <u>or beneficial uses are not impaired</u>, the chlorophyll-a values may be modified to an appropriate value for that water body.

State Regulations Chlorophyll-a Standards and the 303(d) Assessment Process

- Oregon's 303(d) assessment methodology chlorophyll-a is assessed for the designated use of aesthetic quality.

- In cases where waters exceed the chlorophyll-a values and the necessary studies are not completed, the Department may approve new activities such as permits above currently approved permit limits or discharge loadings from point sources provided that it is determined that beneficial uses would not be significantly impaired.

Next...
Executive Director Comments ...

State Regulations Chlorophyll-a Standards and the 303(d) Assessment Process
Executive Director Comments

States Outside EPA Region IV
AZ, CA, CO, KS, MD, MO, MN, NE, NV, NJ, OK, OR, TX, VA, WV

States in EPA Region IV
AL, **FL, GA, NC, SC, KY, MS, TN**

- Detailed information and evaluations will continue to be collected and reviewed by UNRBA consultants for possible use in developing and evaluating modeling scenarios and potential UNRBA alternative implementation strategies for the re-examination.
- Are there additional aspects of water quality standards and 303(d) issues that we need to include in this ongoing evaluation?
- Status reports and updates will be provided at future PFC meetings

Other Status Items

Budget Schedule for FY2021

- Update dues table with 2019 flows is available
- Updated table to members
- Budget to the Board in March and approved

Communications

- Current contract is completed with completion of the Forum; new contract not in place
- Will place on future PFC agenda to discuss priorities and work scope for 2020-2021
    - Forum follow up will continue
        - Local government meetings as requested (as possible under current meeting constraints)
        - Follow up on information requests and distribution
        - Evaluate best ways to utilize UNRBA resources to support member needs
    - IAIA communication/coordination
        - Consultation with DWR and individual jurisdictions to finalize the Program document (investment levels, etc.)
        - Status update with DEQ and impacts to other practices
        - Presentation to EMC WQC

UNC Collaboratory Jordan Lake Modeling Reports

- Today we heard from Jonathan Miller on the Jordan Lake Watershed modeling
- We anticipate presentations from two lake modelers at the May and June PFC meetings:

  - Dan Obenour May 5, 2020
  - Jim Bowen June 2, 2020

Ongoing DEQ/DWR Items

- MOA for re-examination
- 303(d)
- 2019 UNRBA Data Report meeting—Schedule for face to face when possible
- IAIA Program meeting with DEQ/DWR (depending on availability and ongoing COVID-19 Response)

Future Meetings as Currently Scheduled:

Next MRSW Meeting
May 5, 2020, 9:00 AM to 10:30 AM
Butner Town Hall

Next PFC Meeting
May 5, 2020, 10:40 AM to 1:10 PM
Butner Town Hall

Next BOD Meeting
May 20, 2020, 9:30 AM to Noon
Butner Town Hall

Closing Comments

Additional Discussion