Path Forward Committee Meeting
Butner Town Hall with Remote Access
December 6, 2022

Agenda

- Opening Comments, Agenda Review/Revisions
- Modeling Status
- Developing Recommendations for a Revised Nutrient Management Strategy and a Petition for a Site-Specific Chlorophyll-a Water Quality Standard
- Communications Support
- Other Status Items
- Closing

Modeling Status

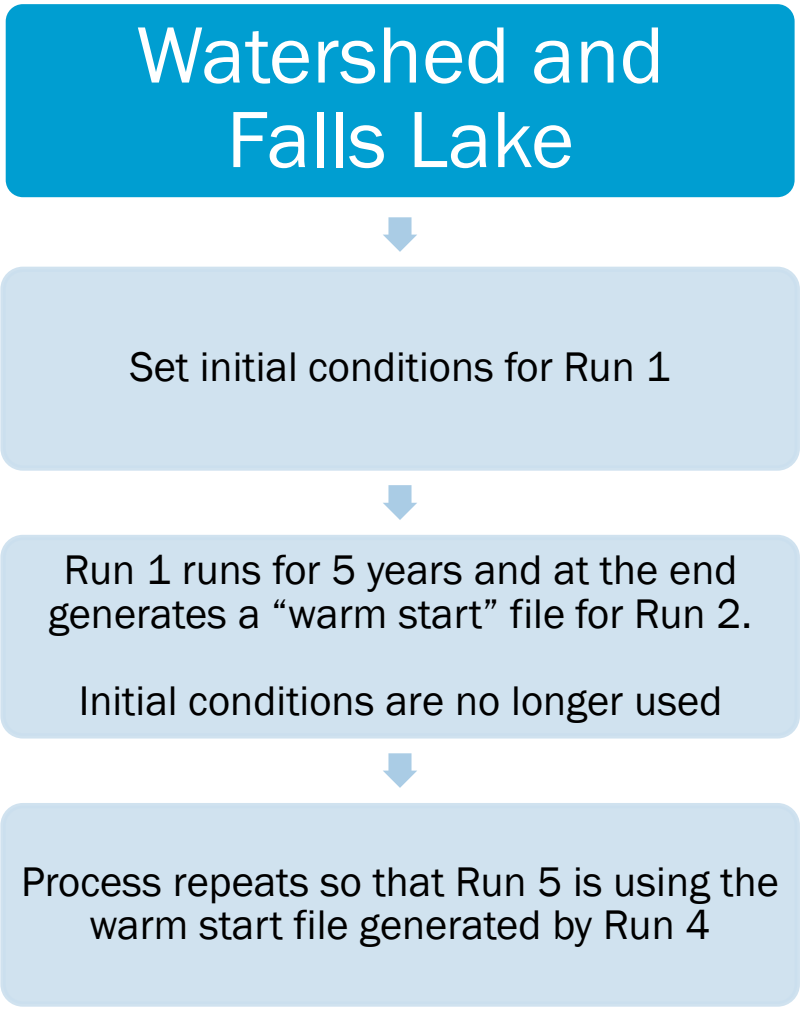
Watershed Model Report Status

- The draft WARMF watershed modeling report was distributed to the MRSW on June 30, 2022
- We have received comments from several MRSW members including DWR in July and August
- Modeling team is compiling and addressing comments in a revised report to be submitted to the PFC
- Following PFC review and input, the report will be finalized for submittal to DWR for their formal review along with model files
- Delivery of the watershed model files has not yet occurred
  - The WARMF Lake model is part of the complete package and is not final
  - The new GUI (underdevelopment) will be needed to run the full model with all functionality
  - Plan to schedule a training workshop with DWR and others interested in running the model once the new GUI is ready and the lake model is calibrated (November/December)

WARMF Lake Modeling

- At the November 1, 2022, meeting, the MRSW approved the WARMF Lake model calibration
- Because the lake model is embedded in the watershed model, both have to be run five times (25 years)
  - This is required to stabilize the soils in the watershed by land use
  - This has the effect of "washing" out the lake sediments as well, and the initial lake sediment conditions based on the UNRBA sediment quality studies are "lost"
- To provide a more accurate starting point for the lake sediments for the 5th model run, a code modification is required to set lake sediments to initial conditions rather than using the warm start file generated by the 4th run
- The Chair of the MRSW and Executive Director discussed this need and approve this scope modification
- This should not significantly affect model calibration, but the revision will provide more accurate tracking of sediment release rates of nutrients

Current WARMF Model Configuration Using Warm Start Files for the Watershed and the Lake



Code Modification to Use Warm Start for the Watershed and Initial Conditions for the Lake

Watershed

Set initial conditions for Run 1

Run 1 runs for 5 years and at the end generates a "warm start" file for Run 2.

Initial conditions are no longer used

Process repeats so that Run 5 is using the warm start file generated by Run 4

Falls Lake

Set initial conditions for Run 1

Run 1 runs for 5 years.

Rather than use the warm start file in the lake, Run 2 resets the initial lake sediment concentrations

Process repeats so that Run 5, which is simulating the 2014-2018 period, uses the initial conditions of the lake sediments

EFDC Lake Modeling Status

- During the May and August MRSW meetings, the modeling team presented comparisons of observed biovolume and chlorophyll-a data in Falls Lake and discussed calibration challenges
- Model is limited to algal groups that can be included—actual distribution of groups is broader
- Modeling team has continued to discuss model calibration with subject matter experts and DWR modeling staff
  - September 26, 2022 (with DWR and SMEs)
  - October 13, 2022 (with SMEs)
  - November 17, 2022 (with DWR and SMEs)
- Further refinements have been made and model performance has improved
- Today during the MRSW meeting, we will review the final calibration results for EFDC

Lake Model Reporting Status

- The modeling team is continuing to draft sections and appendices of the lake modeling report.
- The lake modeling report will include technical appendices for each lake model (WARMF Lake, EFDC, statistical/Bayesian)
- Sections of the draft lake model report will be reviewed by the MRSW in early spring 2023
- We will work with subject matter experts and DWR regarding time series comparisons to observed data
- Current focus is on responding to comments on the watershed modeling report

Developing Recommendations for a Revised Nutrient Management Strategy and a Petition for a Site-Specific Chlorophyll-a Water Quality Standard

Developing Recommendations for a Revised Nutrient Management Strategy and a Petition for a Site-Specific Chlorophyll-a Water Quality Standard—Review of Status

- The UNRBA has been meeting with DEQ and DWR leadership to discuss coordination efforts to
  - Finalize the models
  - Develop a revised nutrient management strategy
  - Develop a petition for site specific criteria
- DWR will identify a contact for standards development
- The UNRBA will continue to work with other stakeholders on these items as well
- The subject matter experts continue to evaluate other State's site-specific standards for chlorophyll-a and nutrient-related standards
- Coordinate with Dr. Marty Lebo to integrate his work into the statistical modeling and regulatory support efforts—engage Marty with the other modeling efforts

Timeline for Developing Recommendations for a Revised Nutrient Management Strategy

November and December 2022

Discuss PRELIMINARY DRAFT concepts

February and March 2023

Discuss administration, reporting, and partnering options

March and April 2023

Draft concepts document

Expanded stakeholder engagement

Late summer 2023

Draft program document by late summer

Fall 2023

Stakeholder workshop to review a final draft document

Provide our report to the Collaboratory for reference

Legislative requirements for December 2023

NC Policy Collaboratory final Falls Lake report

Submittals from other groups

DWR to begin rule making within 6 months/no later than December 2024

DWR to begin their stakeholder process

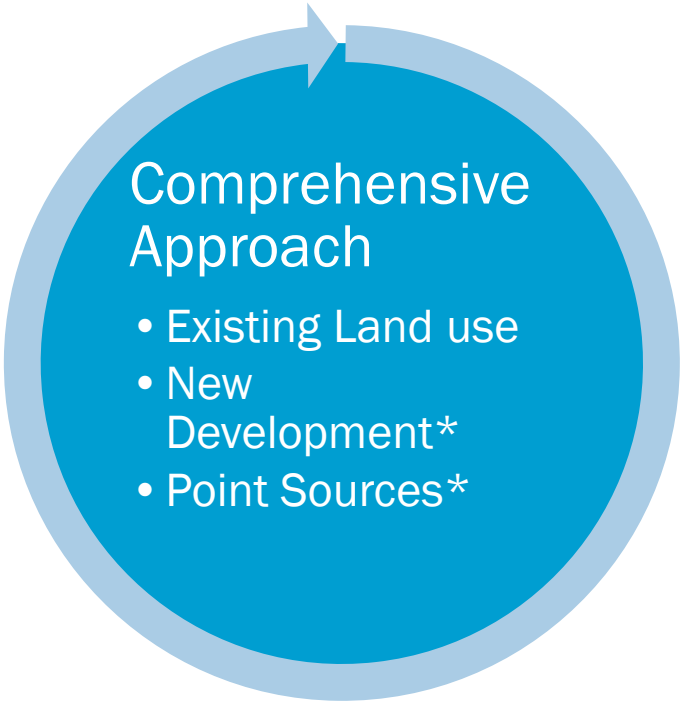
DWR anticipates rules readoption by 2026/2027

Evolving Principles for a Revised Strategy—Updated from our November 1st Discussion

- Embrace a systems approach focusing on right-sized solutions
- Create an adaptive program with look-back period
- Continue to build on the excellent cooperation and collaboration provided by the stakeholders – avoid silos, allow joint projects
- Expand types of voluntary participants (ag, minor WWTPs, etc.)
- Allow tiered participation (those with quantifiable requirements versus potential partners like agriculture)
- Focus on whole watershed health and local implementation
- Develop a fair and equitable program
- Build on the IAIA, tracking compliance by investment levels and tracking nutrient reductions as supplemental information
- Address environmental and social justice issues
- Consider sustainability, energy reductions, and other water resource benefits in addition to nutrient reductions

Nutrient Reduction Opportunities

- Existing land uses
  - Agriculture *(discussed in November)*
  - Urban development
  - State and Federal lands
  - Institutions
  - Stream bank erosion/restoration
  - Forest management
  - Atmospheric deposition and climate resilience
  - Sanitary sewer overflows (SSO)
  - Onsite wastewater treatment systems (OWWS)
- New development*
- Point Sources*



* These categories are listed separately because they have additional, separate regulatory requirements.

The following slides pick up from our November discussion on existing lands and associated nutrient reduction opportunities that could be considered eligible actions.

Those slides are inserted in the last section of this presentation and are included in the posted presentation for reference.

Urban Development, State and Federal Lands, and Institutions

- Expand education activities to address SCM maintenance
  - Target HOA Boards and other SCM owners (address long-term issues)
  - Include jurisdictions that do not have permitted education requirements
  - Understanding that this is a local decision
- Coordinate to fund retrofits for existing and re-development
  - Possibly provide incentives to owners to encourage participation
  - Potentially pay for retrofits and take over inspection and maintenance, but the ownership would not change (e.g., Hillsborough dry ponds)
- Improve HOA management and maintenance
  - Provide funding for upkeep of SCMs
  - Evaluate development bonds for SCMs as a funding source for maintenance and repairs
- Improve existing stormwater infrastructure
  - Inspection and maintenance
  - Outflow management

Urban Development, State and Federal Lands, and Institutions PFC Discussion

- Type meeting notes here

Forestry

- Sixty percent of the watershed is forested, and atmospheric deposition provides continual inputs of nitrogen, phosphorus, and carbon
- High precipitation and destructive storms increase nutrient export
- Potential project types (based on work of Scenario Screening Group)
  - Stream, wetland, buffer restoration/enhancement
  - Floodplain expansion
  - BMPs: Stream crossing, haul roads, and temporary skid trails
  - Consideration of water usage by tree species in forestry management
  - Nitrate capture/denitrification following large, destructive storms
  - Controlled burns, harvesting, forest management, vegetation management (native/non-native)
  - Phytoremediation (using plants to clean up contaminated environments)
- Land use with multiple owners will complicate implementation
- Allow members with quantifiable actions to provide funding for best management practices and projects including forest preservation
- Understanding also that significant forest areas in the watershed are under ownership by farmers—want to engage them on this evaluation
- Expanded outreach: NC Forestry Assoc., Forest Landowners Assoc.

Forestry PFC Discussion

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Streambank Erosion

- Approximately 15 percent of the total phosphorus load to Falls Lake comes from streambank erosion (UNRBA WARMF model)
- High precipitation events increase peak flows and nutrient and sediment loads
- Potential project types (direct and indirect)
  - Stream, wetland, buffer restoration/enhancement
  - Floodplain expansion
  - Green infrastructure/infiltration devices
  - Climate sustainability projects
- Land use with multiple owners will complicate implementation
- Allow members with quantifiable actions to provide funding for best management practices and projects including stream restoration

Streambank Erosion PFC Discussion

- Type meeting notes here

Atmospheric Deposition and Climate Resilience

- Atmospheric deposition affects all land uses and waters and provides continual inputs of nitrogen, carbon, and phosphorus—this may be a "tracking" and "lookback" issue, but is important
- Larger storms deliver higher loads in shorter periods
- Recognize that climate change is changing statistical flow characteristics—this could impact the effectiveness of existing SCMs
- Potential projects
  - Encourage tree planting adjacent to busy streets and highways; see Forest-Friendly Codes and Ordinance Worksheet
  - Encourage air pollution reduction technologies for point source and vehicle emissions
  - Encourage public transportation and green energy sources
  - Encourage climate resiliency projects at potentially large nutrient discharge sources (e.g., wastewater treatment plants)
  - Improve flood preparedness communications (e.g., operations at watershed impoundments)
- Allow members with quantifiable requirements to provide funding for best management practices and projects that mitigate atmospheric deposition and climate change

Atmospheric Deposition and Climate Resilience
PFC Discussion

- Type meeting notes here

Wastewater-related, Distributed Sources

- These represent a very small portion of load to Falls Lake, but can affect its tributaries more significantly
- Potential projects to address sanitary sewer overflows (SSO) and sewer exfiltration
  - Continue to reduce volumes reaching the stream
  - Identify and repair potential issues
- Potential projects to address onsite wastewater treatment systems (OWWS) including discharging sand filters (DSF)
  - Continue to reduce failure rates, inspect and repair malfunctioning systems, prioritize inspections in older neighborhoods, provide grant programs to subsidize homeowner costs for new systems/repairs, etc.
  - Address issue of expanding sewer that may reduce the number of onsite systems but will increase development intensity and impervious surfaces
  - Address regulatory issue with State-issued new permits for DSF
- Allow members with quantifiable actions to provide funding for best management practices and projects
- Continue to factor point sources into the project tracking and monitoring of progress and changes in the nutrient balance over time

Wastewater-related, Distributed Sources
PFC Discussion

- Type meeting notes here

Point Sources (Major and Minor)

- Define Best Practical Technology and calculate allocations based on currently permitted flows
  - Major WWTPs are currently operating at BPT based on work of the SSG
  - Several of the minor facilities have also achieved significant reductions from the baseline period
- Potential projects (based on work of the SSG)
  - Two of the minor facilities are not achieving effluent concentrations comparable to the others; consider funding assistance for system upgrades
  - Consider constructed wetlands to polish effluent from minor facilities
- Explore potential to incorporate minor facilities into a joint compliance framework to allow jurisdictions to support funding improvements, upgrades, polishing steps, etc.

Point Sources (Major and Minor) PFC Discussion

- Type meeting notes here

New Development

- Leave requirements mostly as under the current Strategy/Rules
- Seek stakeholder input on this regulatory component of a revised strategy
- Address the issue of families being able to subdivide land to heirs without stormwater permits
- Consider local government UDO changes that allow flexibility in implementing beneficial practices and activities
  - Incentivize green infrastructure, disconnected impervious services, soil improvement, low maintenance lawns, etc.
  - Revisit soil improvement practice with DEMLR: currently creditable only for existing development but most beneficial for new development
  - Adopt policies allowing treatment within street rights of way or other easements
  - Encourage/partner/incentivize larger regional SCMs that could treat upstream existing development as well as new development
  - Improve information transfer from developers to HOA Boards
  - Build from benefits of current jurisdictional approaches
    - Current inspection programs are efficient
    - City of Durham now has the authority to assess penalties
    - Coordinate workshops to provide education about existing programs that work well

New Development PFC Discussion

- Type meeting notes here

Ideas Discussed but Not Included

- Ideas discussed (based on stakeholder discussions)
  - Convert stormwater systems into true utilities
  - Place SCMs under the jurisdiction of the county/city/town and transfer the system to the local government so HOAs are not tasked with maintaining them
- Issues identified/reasons for not including
  - There are thousands of existing SCMs with new ones added regularly
  - Stormwater programs are already underfunded
  - Increasing taxes and fees is often challenging
  - Even with an increased budget, the number of staff needed at the local stormwater programs to manage all systems is unmanageable
  - Current programs (inspections, education, maintenance, enforcement) are the most efficient way to handle SCMs

Ideas Discussed but not Included
PFC Discussion

- Type meeting notes here

Other Considerations for Future Discussions

- Administrative frameworks if an expanded IAIA approach is used (e.g., watershed organization with expanded membership and membership tiers)
- Governance and decision making, particularly with partners (e.g., a committee led by agriculture would make decisions about projects affecting agriculture)
- Enabling legislation to allow an investment-based approach rather than counting pounds of nutrients reduced
- Delegation of State authority for implementation
- Regulatory limitations and opportunities—define level of delegation
- Development of the revised strategy
  - Timeline
  - Stakeholder outreach and input
- Identify other streams and impoundments in the watershed as covered by the strategy
  - These waters should not be considered Category 5 waters in future Integrated Reports and should not require separate, additional management strategies

Communications Outreach and Preparation

Communications Outreach and Preparation

- Continued engagement with DWR
- Planned workshops and symposia
  - WARMF Model Training with UNRBA and DWR
    - Winter 2022
  - UNRBA Technical Stakeholder Workshop (see next slides)
    - Winter 2023
  - Workshop with local government communications staff
    - Spring 2023
  - Workshop with DWR/NC Policy Collaboratory/NGOs
    - Spring 2023
  - Joint symposium with NC Policy Collaboratory
    - Summer 2023
  - Stakeholder workshop to discussed final draft strategy
    - Fall 2023
- Recent staff changes at member local governments highlight the need for UNRBA engagement from multiple staff across the levels of each local government.

Communications Outreach and Preparation

- The Executive Director will continue to reach out to local government staff to identify needs and support staff with implementation of the IAIA Program and participation in developing the revised nutrient management strategy.
- During the November 16, 2022, meeting, Compliance Group Committee (CGC) members approved the Year 1 annual report for the IAIA program
- CGC members also suggested development of a follow up press release to provide additional information about the number and types of projects for which funds were allocated in Year 1 of the IAIA.
- A request for have this information posted to the UNRBA website was also made by environmental advocates that partnered on development of the program.

Other Status Items

Ongoing Items

- More intensive outreach and stakeholder engagement and management of expectations and resources—A lot to do between now and recommendations in 2023
- Ongoing DEQ/DWR Items
  - Continued engagement with staff and leadership
  - Building agreement with timeline for EPA outreach
  - MOA
  - Neuse Watershed Model Information Session – Delivery Factors for WWTP—Update provided by John Huisman

Future Meetings as Currently Scheduled:

Next PFC/MRSW Meeting: January 3, 2023
schedule to be determined

Next BOD Meeting: January 18, 2023, 9:30 AM to Noon

Closing Comments
Additional Discussion

Meeting Slides Discussed During the November PFC Meeting for Reference

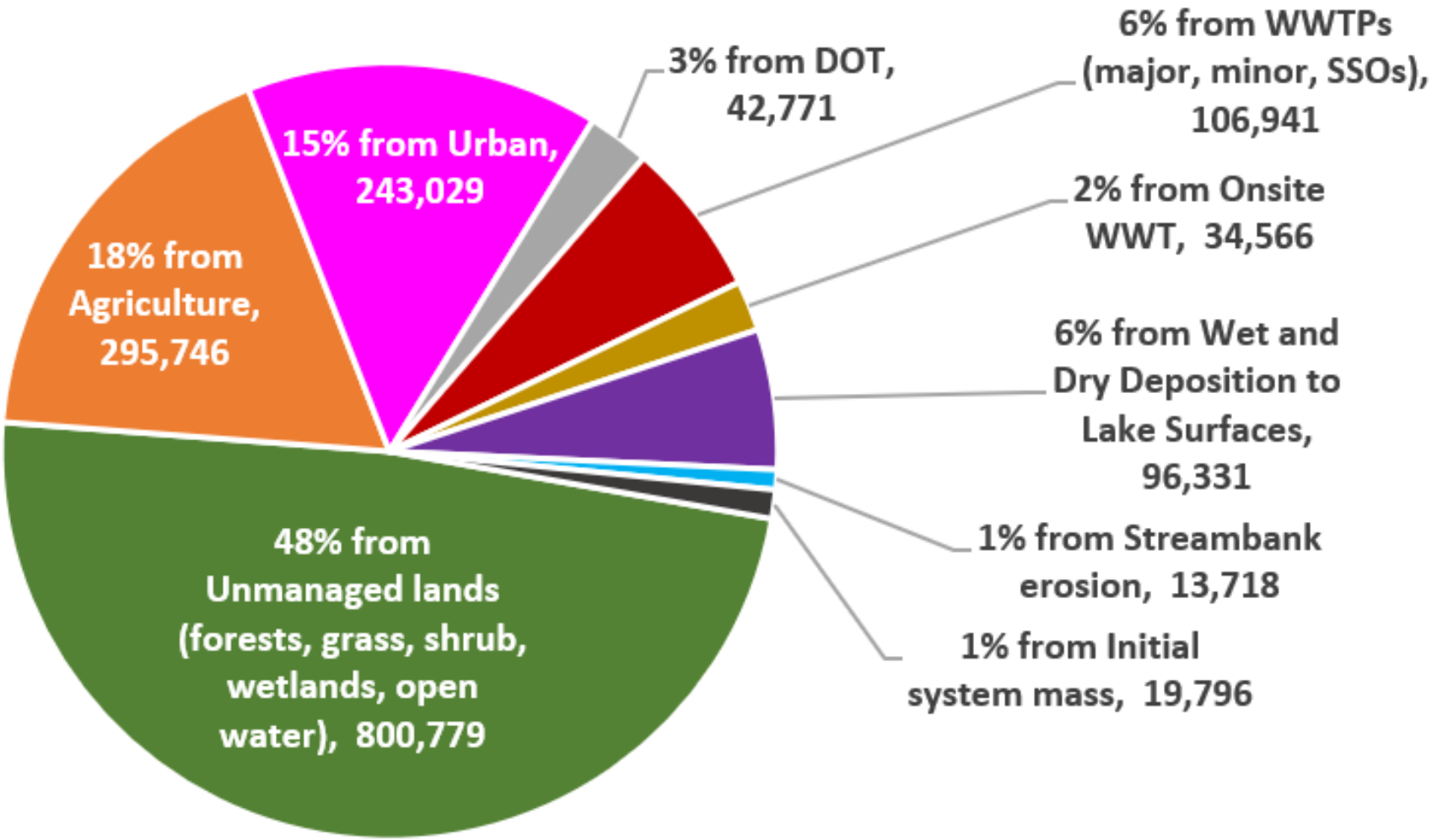
Basis for Concepts and Current Intent

- Preliminary concepts gathered from discussions and input from internal and stakeholder stakeholders
  - Executive Director and Co-chairs of the PFC
  - Scenario Screening Workgroup and its subgroups
  - MRSW, PFC, UNRBA Board members
  - Workshop/symposium/regulatory forum participants
- Discussions based on scientific studies and evaluations
  - Findings from the UNRBA's Monitoring Program
  - Results of the watershed modeling effort
  - Ongoing development of the lake models
  - Support and development of the IAIA
  - Research efforts to date from Collaboratory funded projects
- Current intent
  - Frame the concepts, alternatives, and considerations that have been identified to this point
  - Evolve as input from other stakeholders is received

Key Findings from Monitoring and Modeling Studies

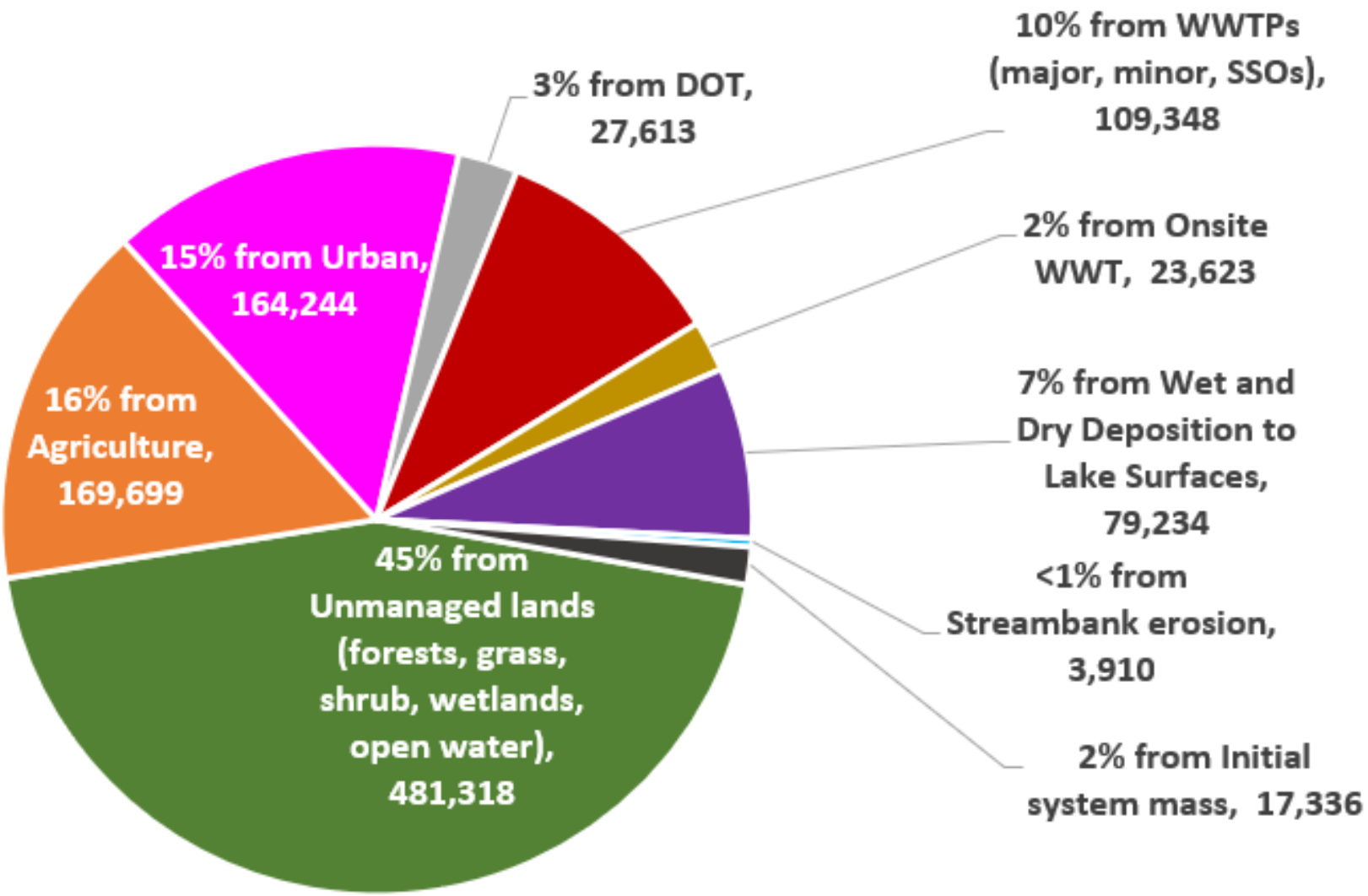
- 75 percent of the watershed is unmanaged land; these areas contribute approximately ½ of the nutrient load to Falls Lake in average to wet years
- Major wastewater treatment plants have significantly reduced nutrient loading (24% for TN and 69% for TP)
  - Now contribute less than 6 percent of the nutrient load to Falls Lake during average to wet conditions and less than 10 percent during dry to average conditions
  - Little room for additional improvements with current technology
- Water quality in Falls Lake is significantly affected by very large storm events and USACE lake operations
- Soils in the watershed and lake store and cycle nutrients for decades
- Atmospheric deposition contributes ½ the nitrogen input to the watershed
- Agricultural best management practices, reduced production acres, and fertilizer optimization leave little room for additional reductions
- Over 350 existing development retrofits implemented in the watershed;
- Bill Hunt et al. (2012) indicates if ALL potential existing development retrofits identified in the Ellerbe Creek watershed were implemented ($16 million capital and $7 million annual maintenance costs), it would only reduce nitrogen loads by ~10 percent and phosphorus loads by 25 percent
- New development rules have been in place since 2012

Sources of Delivered Total Nitrogen Load (1.65 million pounds per year – average to wet hydrologic condition)



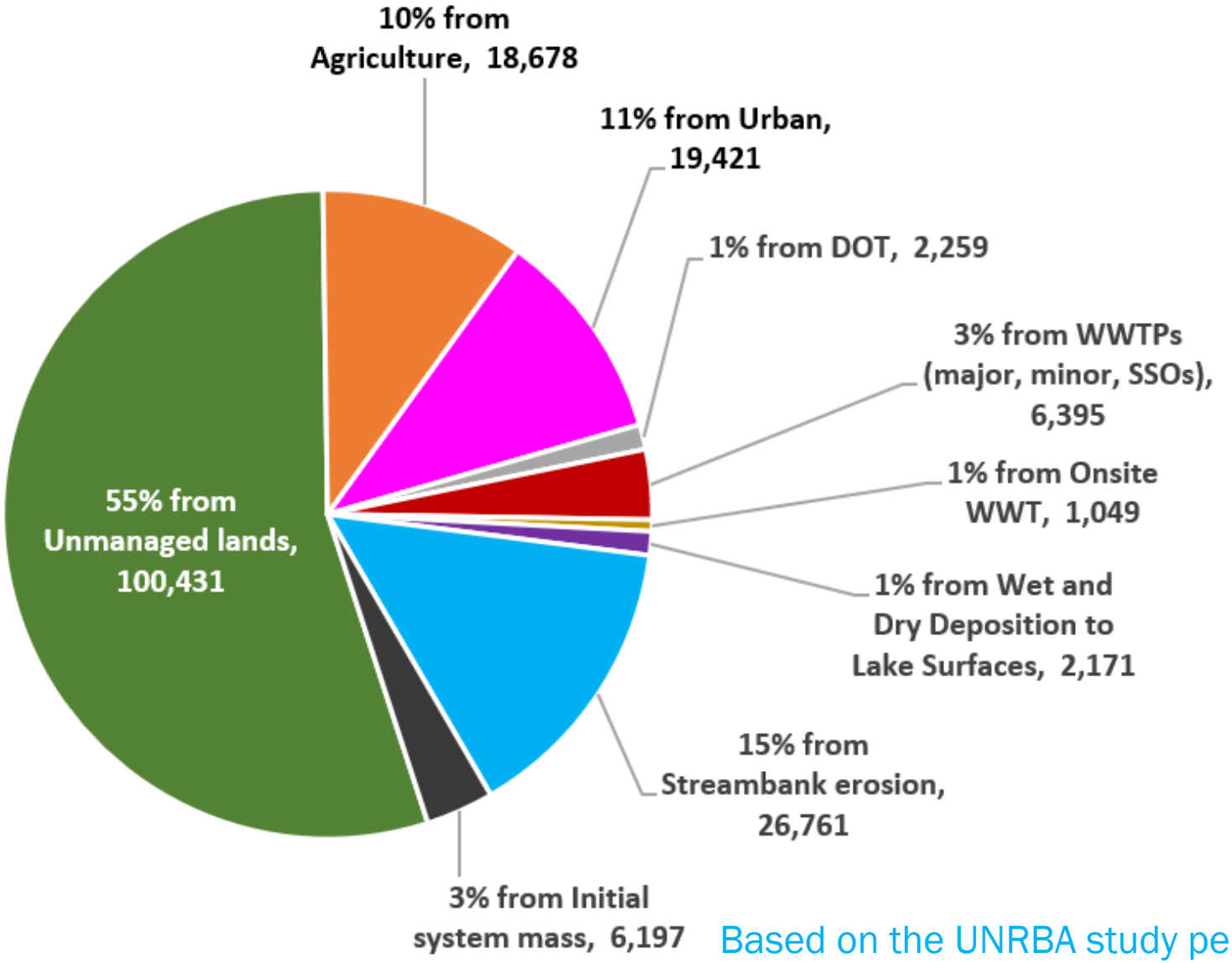
Based on the UNRBA study period (2014-18)

Sources of Delivered Total Nitrogen Load (1.08 million pounds per year – dry to average hydrologic condition)



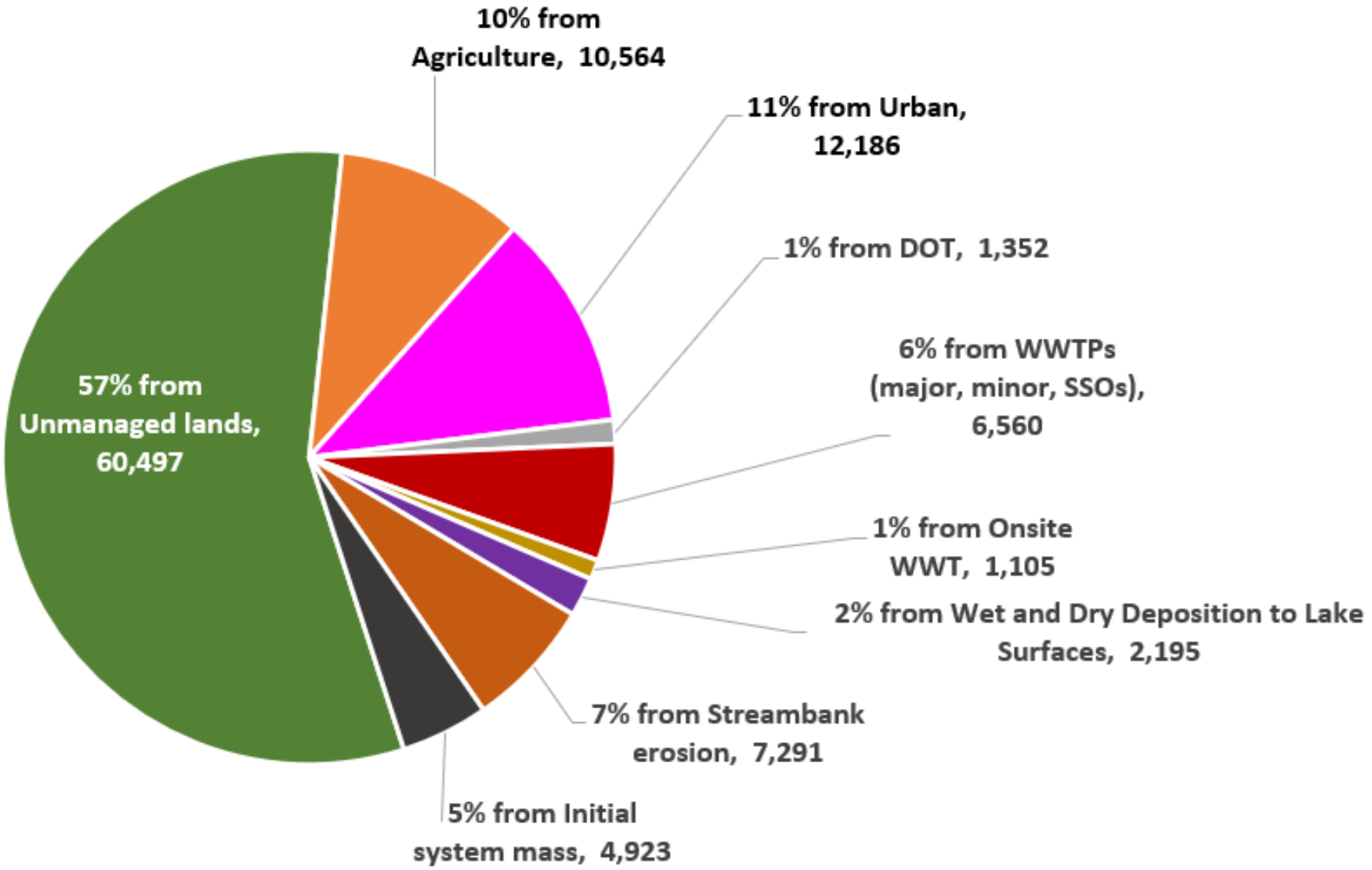
20% less precipitation applied to UNRBA study period results in 35% less TN to the lake.

Sources of Delivered Total Phosphorus Load (184,000 pounds per year - average to wet hydrologic condition)



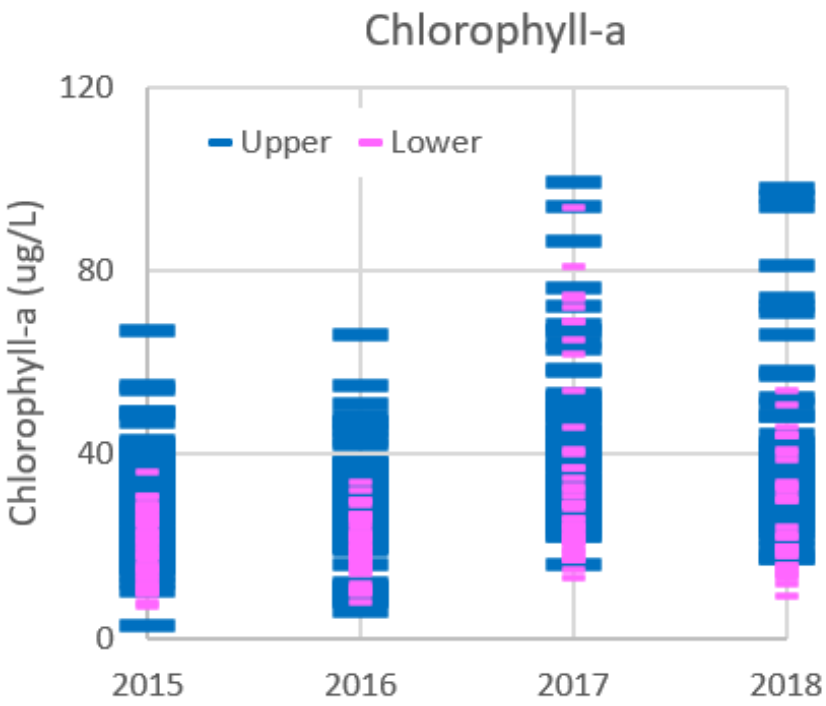
Based on the UNRBA study period (2014-18)

Sources of Delivered Total Phosphorus Load (107,000 pounds per year – dry to average hydrologic condition)

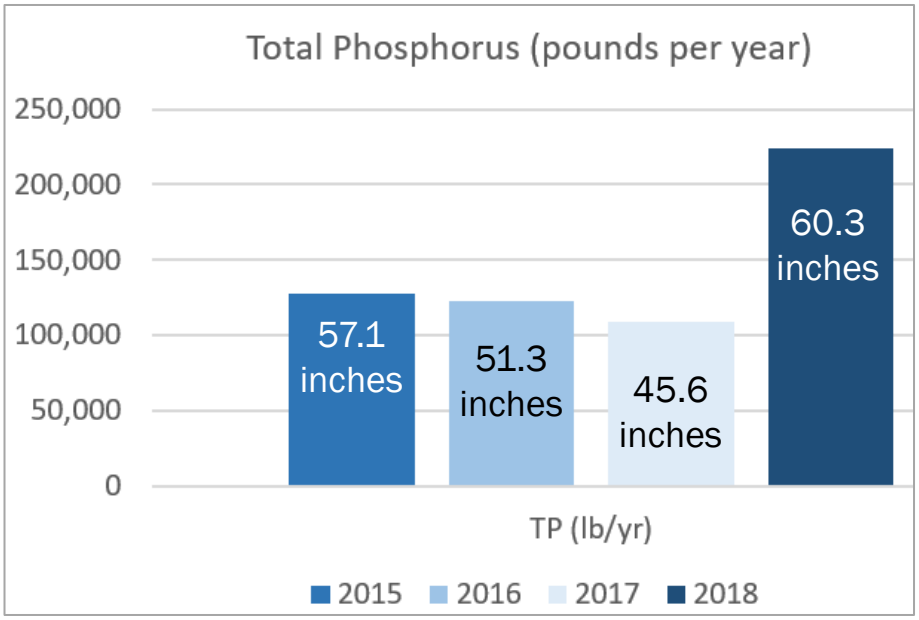


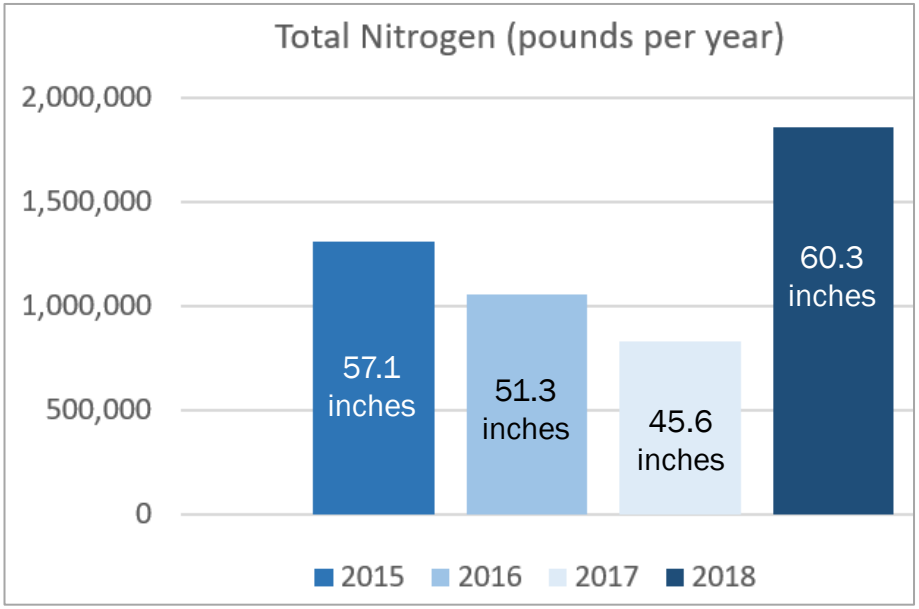
20% less precipitation applied to UNRBA study period results in 42% less TP to the lake.

Annual Delivered Loads, Precipitation Amounts, and Chlorophyll-a Measurements (2015 to 2018)



Chlorophyll-a concentrations below Highway 50 (pink) were highest in the lowest loading year.





Agriculture – Current Status and Approach

- Acres in production have declined 44% from 2006 to 2018
- Feasible reductions have been implemented in the watershed (based on the work of the SSG and several meetings organized by the NC Department of Agriculture with local Districts)
- Components recommended for continuation by agriculture
  - Continue tracking production acreages and fertilizer applied
  - Continue funding cost share programs and tracking participation
  - Continue funding Soil and Water Conservation District projects and local technical assistance and tracking support (i.e., staffing)
  - Encourage Voluntary Agricultural Districts and farmland preservation (allows for Enhanced Voluntary Agricultural Districts to protect farms from development for 10 years); farmers voluntarily enroll

Agriculture – Potential Partnering

- Preliminary recommendation is that agriculture not have a quantifiable requirement under a revised Falls Lake strategy
- Those with requirements (e.g., local governments) for quantifiable actions or investment commitments could support agriculture by contributing additional funds above and beyond existing investment commitments at program outset to support
  - Agricultural best management practices, projects, equipment, materials
  - Local technical assistance, grants, and tracking support
- When projects have a method for quantifying nutrient reductions, agriculture would track these projects and reductions in their reporting (nutrient reductions would be supplemental reporting information if an IAIA approach is used)
- Agriculture may want to track joint projects and agriculture-only projects separately
- Expanded outreach: provide support to agricultural representatives (Farm Bureau and local Districts) to gage farmer interest in these concepts

Agriculture PFC Discussion

- Type meeting notes here