

# ARKANSAS NUTRIENT REDUCTION STRATEGY

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Presented to the Non-point Source  
Stakeholder Meeting in Little Rock, Arkansas  
on September 19, 2019

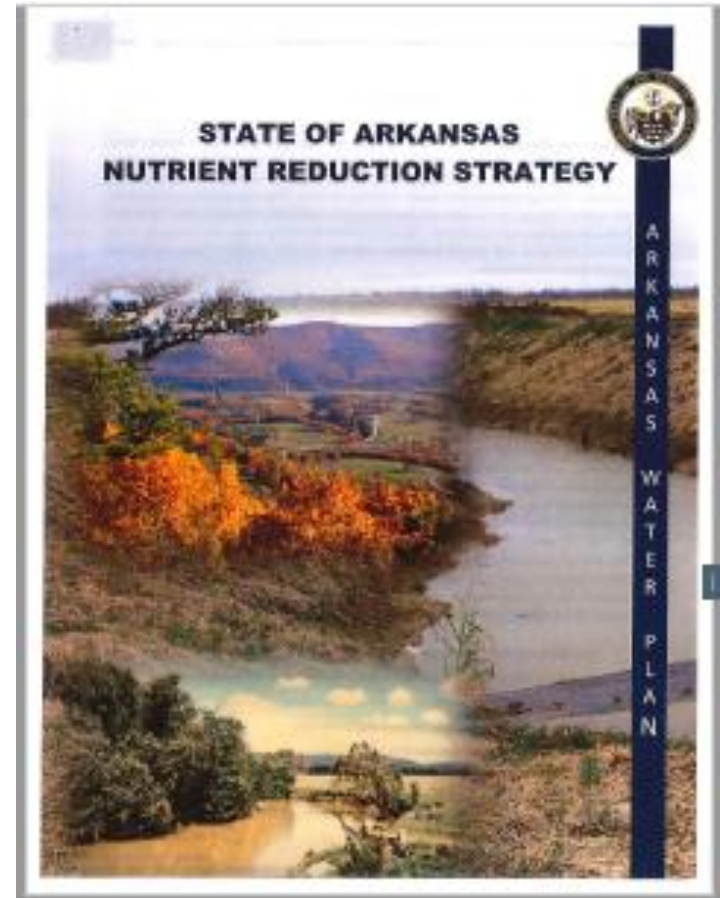
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Deputy Director

# Outline

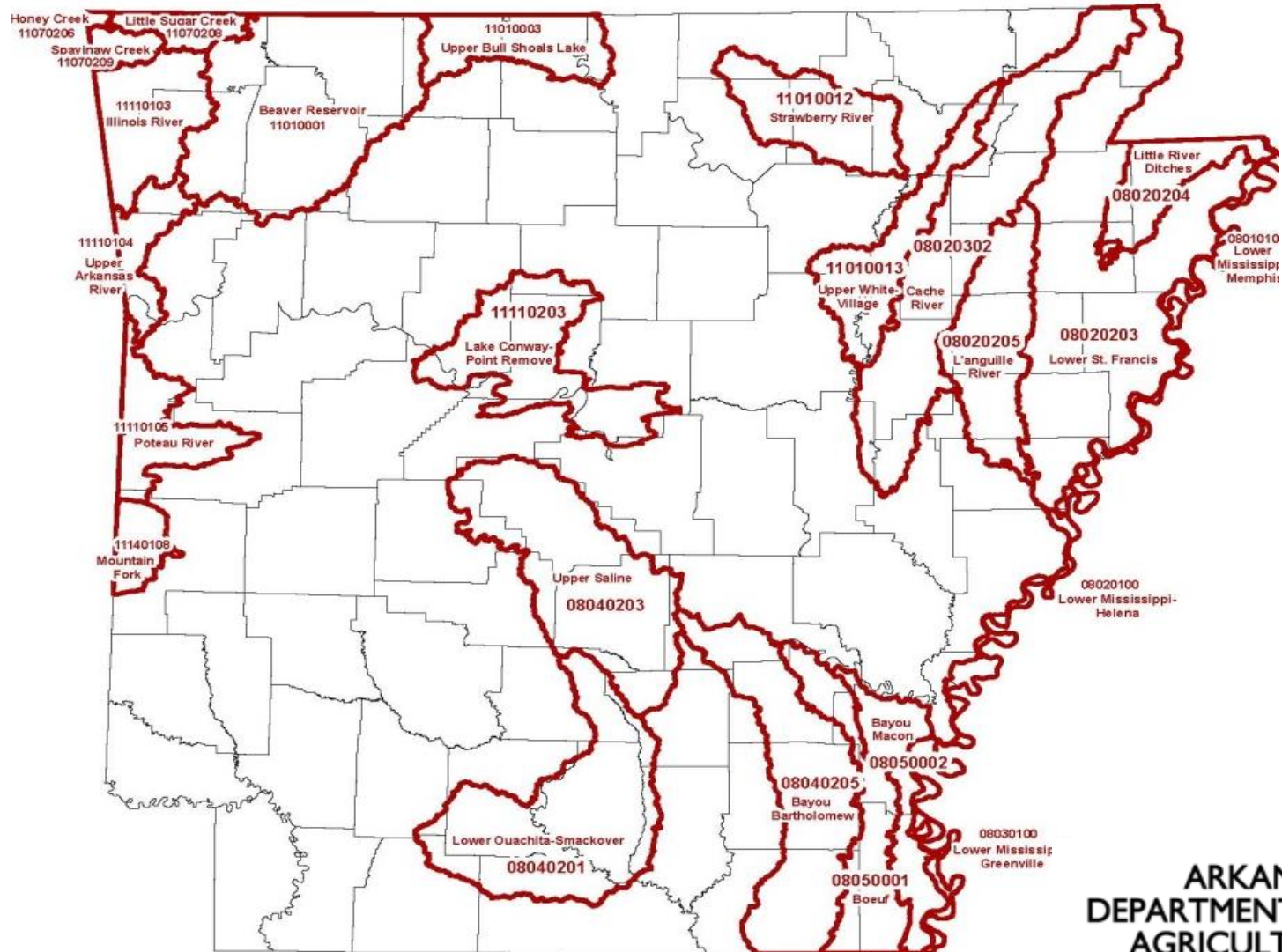
- Arkansas Nutrient Reduction Strategy – 2014 Edition
- Challenges identified with Current Strategy
- Nutrient Reduction Strategy – 2018-2019 Major Update
- Nutrient Load Reporting Tool
- Questions

# Guiding Principles – Current Strategy(2014)

- Strengthening existing programs
- Promoting voluntary, incentive-based, cost-effective nutrient reduction measures
- Incorporating adaptive management and flexible strategic planning;
- Leveraging available financial and technical resources
- Pursuing market-based opportunities and solutions



# Priority Watersheds – Current Strategy(2014)



# Point Source Implementation Strategies

Adopt effective, innovative, and economical treatment technologies.

Monitor and assess watershed impacts from point sources.

Increase knowledge of available treatment processes and reduction effectiveness.

Increase public participation in urban nutrient reduction programs and practices.

Increase implementation of effective urban stormwater management programs.

Expand watershed-based monitoring networks where possible.

Enhance reporting and analysis of trends in nutrient loading and reduction.

Improve nutrient assimilation and uptake capacities in riparian, lake, and wetland areas.

Incorporate regional planning when developing new or upgraded treatment systems.

Incorporate NPDES nutrient standards for major treatment facilities in priority watersheds.

# Non-Point Source Implementation Strategies

Incorporate sediment retention, erosion control measures with improved water management.

Demonstrate farming practices that increase reduction effectiveness and economic viability.

Expand the use of nutrient inhibiting supplements.

Increase riparian buffer zones and functioning wetland areas.

Increase adoption of improved grazing and pasture management practices.

Increase participation in nutrient reduction activities and practices.

Enhance watershed assessment and modeling tools, web-based information and reporting.

Establish regular reporting on nutrient reduction activities and progress.

Explore the feasibility and viability of nutrient trading programs.

Promote manure management programs.

Promote public and private sector partnerships.

Promote LID and other nutrient reduction strategies and programs in urban areas.

Promote research of innovative and effective market-based nutrient reduction practices.



# Major Nutrient Reduction Programs

- USDA Conservation Initiatives
- Arkansas Phosphorus Index
- Arkansas Discovery Farms
- Nutrient Surplus Watersheds



# Issues Identified with Current Strategy



Can not adequately show that the resources expended has resulted in a documentable positive effect on in-stream water quality statewide



Detailed report of the work being done in the State related to Nutrients but does not present a strategy for future work



Lacks a clearly defined goal



No method to evaluate progress or lack of progress



Targeting strategy based on where we are doing work and not based on in-stream nutrient loads or concentration



# Illinois River Watershed

Clearly Defined Goal

Extensive Study and Monitoring

Point and Non-point  
both being addressed

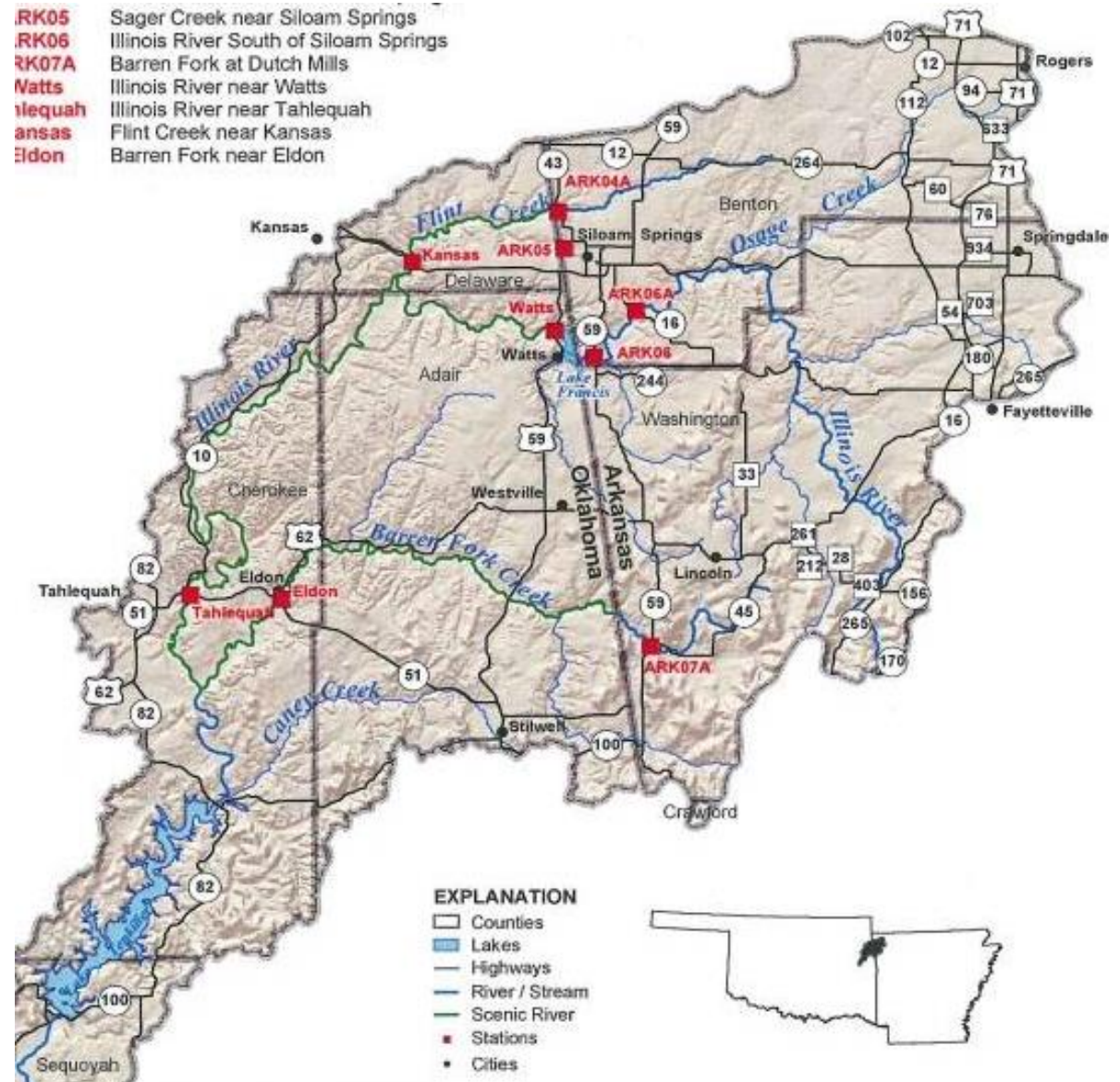
Nutrient Surplus Area

State NPS Initiative

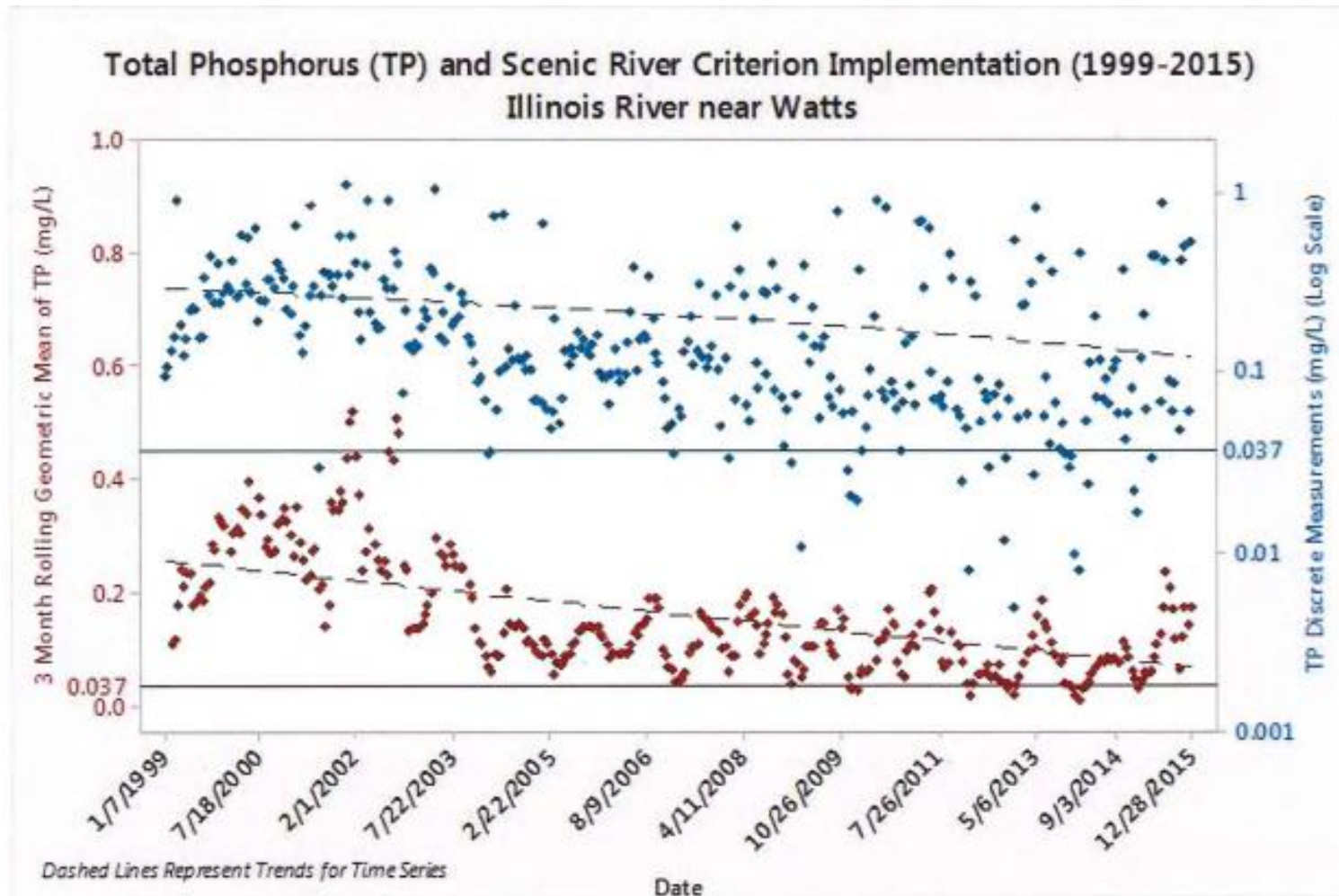
Numerous 319 Projects

NRCS Initiative

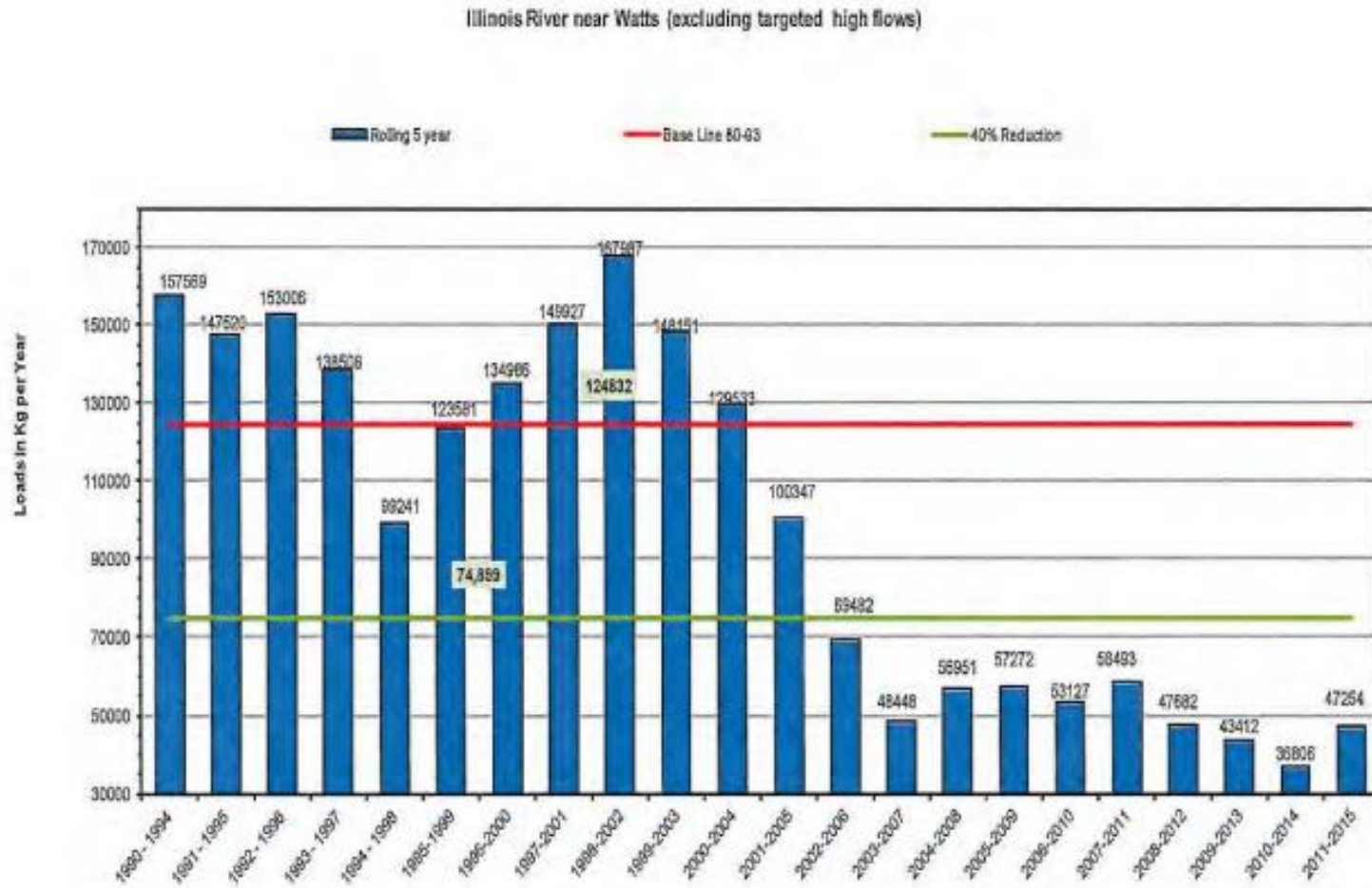
Illinois River Watershed  
Partnership



# TP Concentrations – Illinois River



# TP Loads – Illinois River



# Arkansas Nutrient Reduction Strategy Update



Stakeholder Meetings (2018-2019)



Method to Measure Success



Targeted Nutrient Focus Watersheds



Concentrate/Reallocate Resources

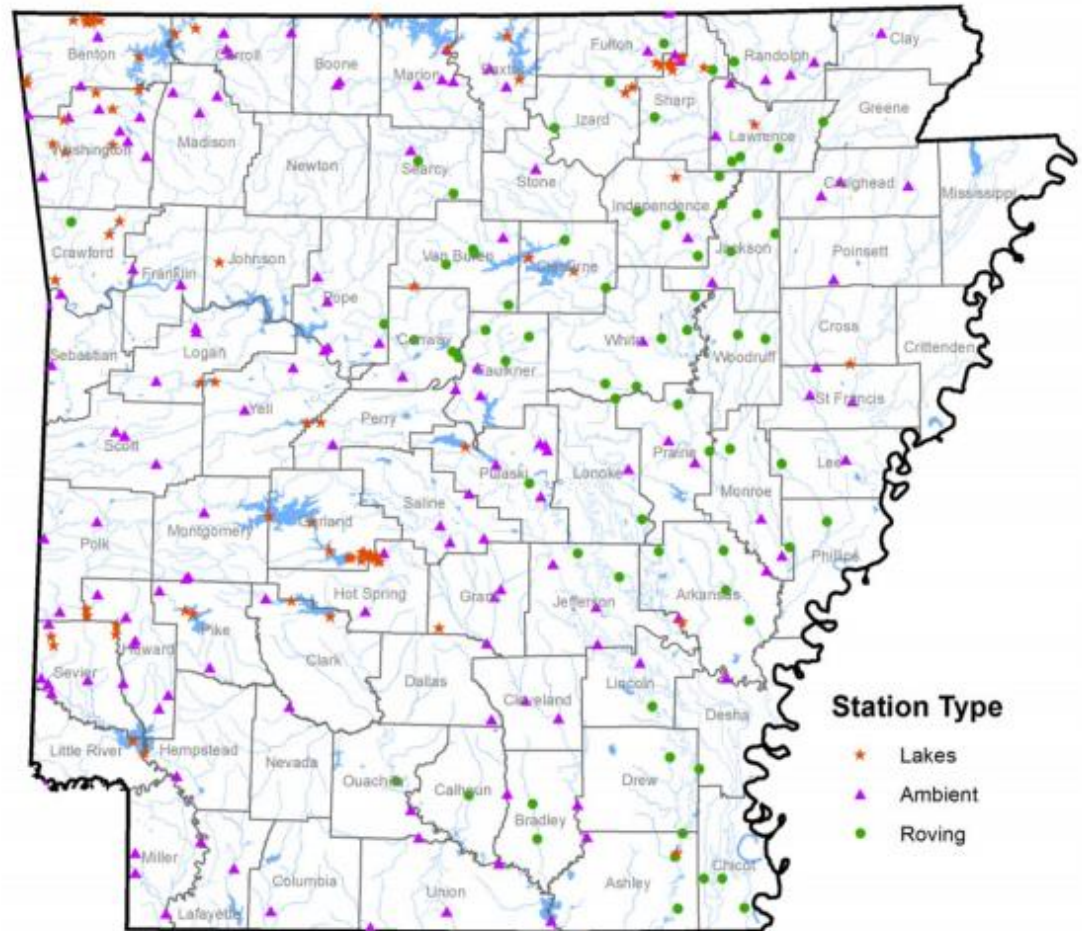


Tool to Report NPS Nutrient Reductions

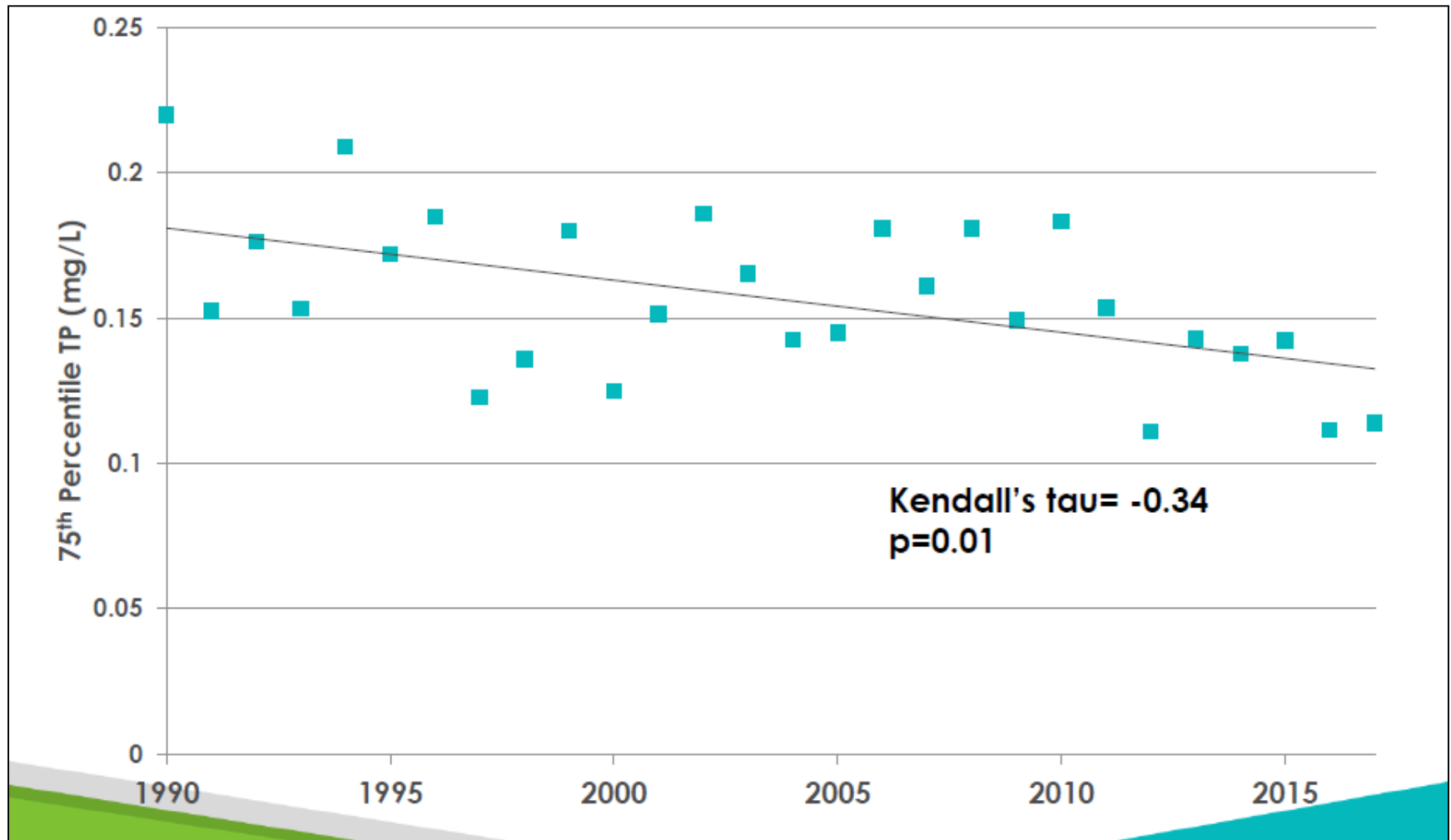


# Measuring Success

- Arkansas will measure progress/success by analyzing the directional change of the 75% of all total nitrogen and total phosphorus concentration data within each 8-Digit HUC from 1990 to present



# HUC-08020303 Lower White



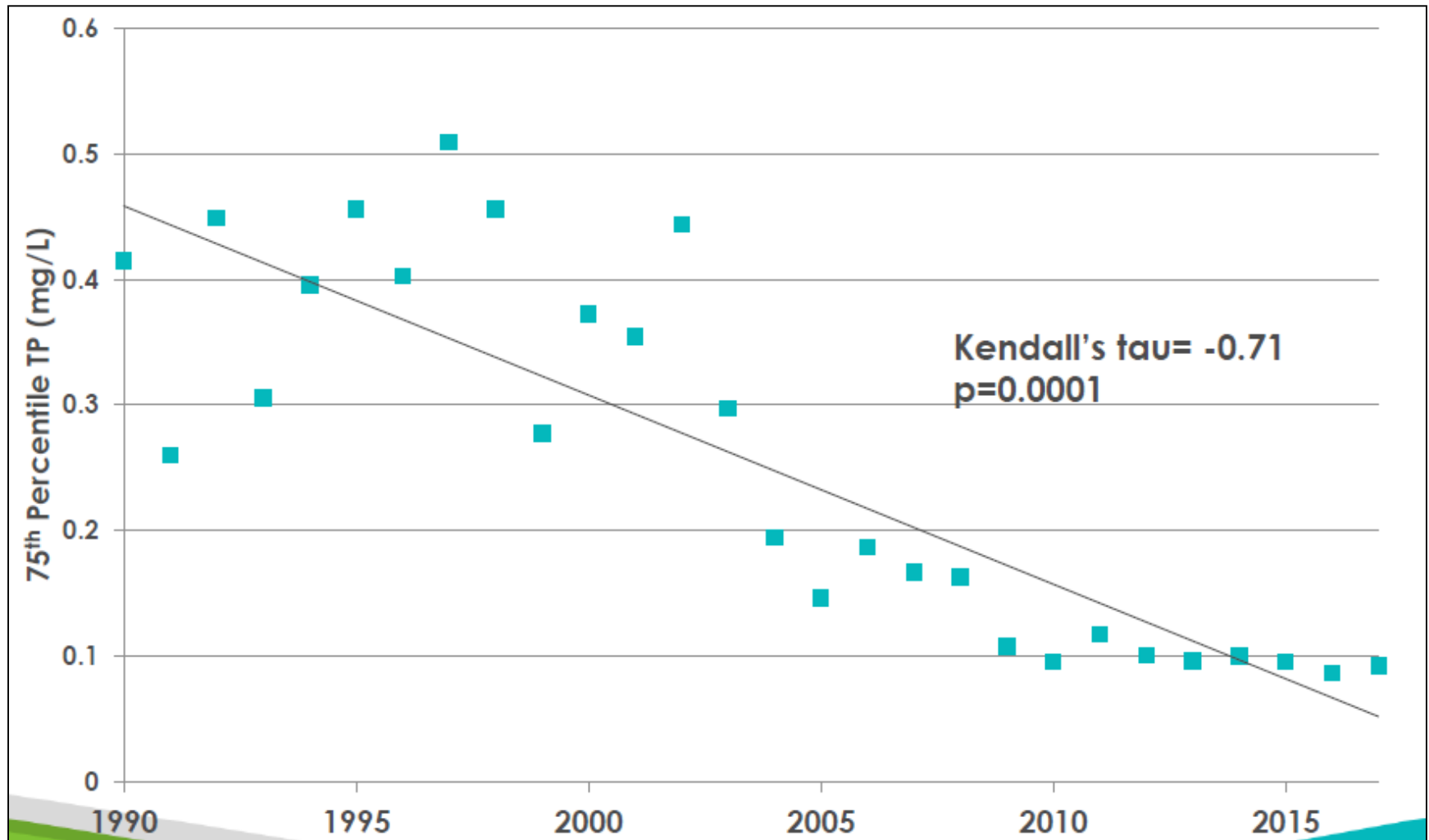
# HUC-08020303 Lower White

- In 13 of 27 years (48), TP was lower than the previous year.
- Only, 11 of 27 (41%) years were lower than 1990
- Significant reduction from 1990 to present
- Overall Reduction

Year	75 <sup>th</sup> Percentile (mg/L)	% Change in 75 <sup>th</sup> Percentile
1990-1995	0.180	
1995-2000	0.161	-10.29
2000-2005	0.158	-2.36
2005-2010	0.177	12.57
2010-2015	0.151	-15.12
<b>90-95:10-15</b>	-	-19.47



# HUC – 11110103 Illinois



# Review of the Significant Trends for all 51 HUC-8 Watersheds

- 17 (33%) had significant ( $p < 0.01$ ) decreases of total phosphorus since 1990
- 23 (45%) indicated a negative, non-significant trend  
Kendall tau values ranged from 0.28 to -0.01
- 10 (20%) indicated a positive, non-significant trend  
Kendal tau values ranged from 0.03 to 0.21
- 1 (2%) indicated a steady increase since 1990  
Kendall tau (0.3),  $p = 0.04$

# Targeted Nutrient Focus Watersheds

Target based on site specific trends using ambient monitoring data/ flow data

- Log-transform data
- Flow adjust concentrations using locally weighted regression(LOESS)
- Evaluate the flow adjusted using various statistical tests

Four targeting categories

- Nutrient Reduction Focus Watershed
- Insufficient Data – High Priority Watershed
- Insufficient Data – Low Priority Watershed
- Nutrient Reduction Low Potential Watershed

# Implementation Strategy

319 Priority  
Watershed  
Designations

Watershed  
Based Plans

Water Quality  
Technicians –  
NMP Adoption

CWRLF Nutrient  
Reduction  
Incentives

NRCS NWQI  
Projects and  
Designations

NRCS RCPP,  
CSP,  
AWEP, EQIP,  
WRE Projects

Nutrient Surplus  
Area  
Designations

Point Source  
Monitoring and  
Reporting of  
Nutrients/Limits

Sceptic Tank  
Replacement  
Grant/Loan  
Program

Discovery  
Farm/Watershed

Watershed  
Group  
Establishment  
and Support



# NPS Reporting Tool



Walton Family Foundation Grant to the HTF



2-3 workshops (Winter 2018-Spring 2019)



April 16-17 – Petit Mountain State Park Lodge



Goal is to develop an Arkansas measurement framework and consensus on nutrient reduction efficiencies associated with individual and suites of management practices



Workshop participants will be invited based on their technical and scientific expertise and experience with nutrient and water management practices.



Approx. 20 scientists and engineers by invitation



Framework to be used across all programs and practices

# Recent Progress

- Breegan Anderson – Start Date September 30, 2019
- EPA Noncompetitive Grant Opportunity
  - 2019 - \$100,000 – Finalize Revised Strategy
  - 2020 - \$100000 – Improve and Implement Reporting Tool
- Hypoxia Task Force – Next Meeting in NWA

# Questions?