Outcomes Estimation Tools Training Webinar Series

Featuring:

Critical Source Area Identification And Management

April 3, 2024

Noon to 1:30 pm eastern

Michelle Perez, PhD
Water Initiative Director

Aysha Tapp Ross
Water & Soil Health Scientist

American Farmland Trust

Michelle

Agenda

- Welcome, Poll (10 min)
- Critical Source Area Handbook - Tate Wentz, Arkansas Dept of Agriculture, Water Quality Division Manager (20 min)
- Oklahoma's use of HAWQS method - Shanon Phillips, Oklahoma Conservation Commission, Water Quality Division Director (20 min)
- Illinois River Watershed Partnership identification and implementation of BMPs - Leif Kindberg, (Illinois River Watershed Partnership Director (20 min)
- Q&A (20 min)

EPA

WALTON FAMILY FOUNDATION

Mosaic

American Farmland Trust

Zoom Webinar Reminders

- Use Q&A Box - last 15 minutes (Vote up!)
- Use Zoom Direct Message feature to Aysha if having technical difficulties
- Email with resources to follow each webinar
- Recordings posted on the webinar series site the following Monday
- **Evaluation survey in the Chat Box**
  - **Complete to be entered to win a $25 gift card!!**

American Farmland Trust

Time for 3 polls!

American Farmland Trust

Tools in 2023 Trainings*

May 3: Webinar Launch & PCOC (recording)

June 7: Model My Watershed (recording)

July 12: Nutrient Tracking Tool (NTT) (recording)

August 2: NRCS Cover Crop Economics Tool (economic) (recording)

September 6: FieldPrint Platform (recording)

October 4: EPA PLET (water quality) (recording)

November 1: PTMApp Web Tool (water quality) (recording)

December 6: AFT Retrospective-Soil Health Economic Calculator (R-SHEC) Tool (recording)

Tools in 2024 Trainings*

January 10: SIPES Method/SIDMA Tool (recording)

February 7: Fast-GHG (climate) (recording)

March 6: Cool Farm Tool (climate) (recording)

April 3: Critical Source Area Identification and Management

May 1: COMET-Farm & COMET-Planner (climate)

June 5: CAST Tool (water quality)

July 10: TBD

August 7: TBD

September 4: AFT Predictive-Soil Health Economic Calculator (P-SHEC) Tool

American Farmland Trust

Planning and Implementation of Conservation in Critical Source Areas through Watershed Based Management Planning in a Multi-Jurisdictional Watershed

Tate Wentz · Water Quality Section Manager · Arkansas Dept. of Agriculture

Shanon Phillips · Water Quality Division Director · Oklahoma Conservation Commission

Leif Kindberg · Director · Illinois River Watershed Partnership

Tate Wentz

Water Quality Section Manager
Arkansas Dept. of Agriculture

Shanon Phillips

Water Quality Division Director
Oklahoma Conservation Commission

Leif Kindberg

Director
Illinois River Watershed Partnership

Today's Training Session

11:00PM….Introductions

11:10PM…Highlight key components and methodologies of the CSA Handbook;

11:30PM…Oklahoma's use of Hydrologic and Analysis Water QualitySystem (HAWQS) to achieve watershed prioritization

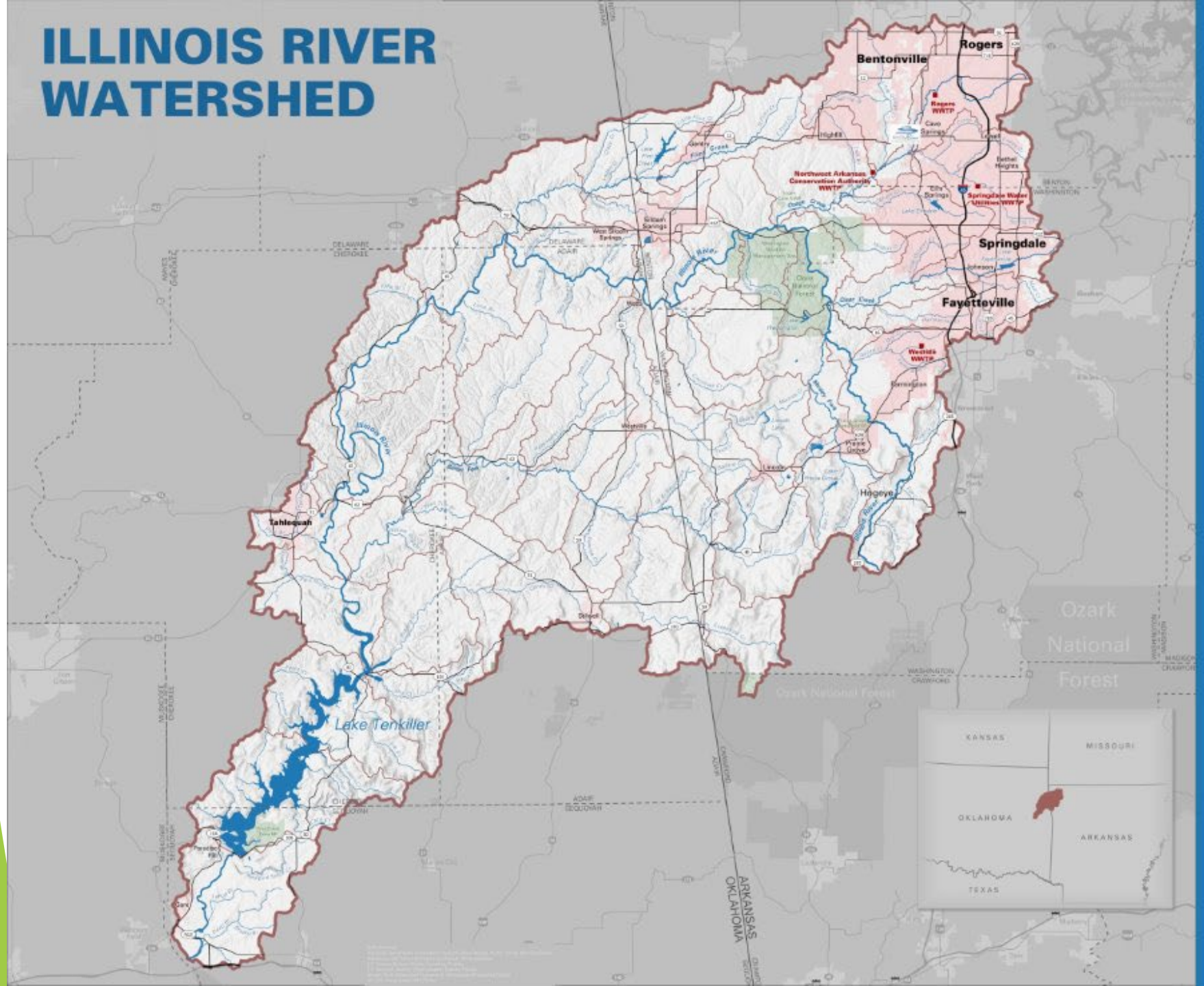
11:50PM…How the Illinois River Watershed Partnership, a local non-profit, has guided local-level identification and implementation of BMPs across watershed sub-basins

12:15PM…Q&A

12:30PM…Conclude

All times are CST

ILLINOIS RIVER WATERSHED



ILLINOIS River
WATERSHED PARTNERSHIP

- Illinois River Watershed Partnership
- Wastewater Treatment Plant (WWTP)
- Headwater Community
- Interstate
- US Highway
- State Highway
- STATE BOUNDARY
- COUNTY BOUNDARY
- Urban Area
- Public Land
- Lake/Pond
- HUC 8 River
- HUC 10 Stream
- Minor Stream
- Illinois River Watershed HUC 8 Boundary
- Illinois River Watershed HUC 12 Boundary

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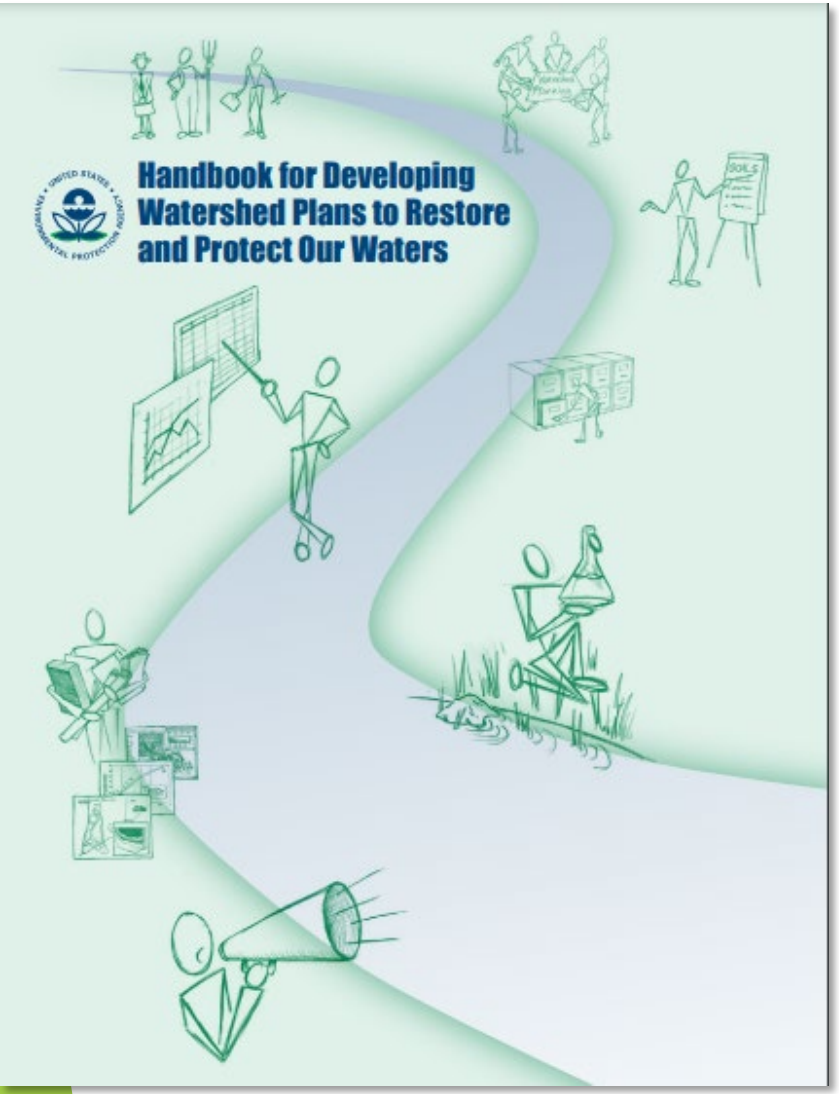
Voluntary, Non-Regulatory Watershed Management Plan for the Illinois River Watershed

3rd Stakeholder Meeting
West Siloam Springs, OK
August 10, 2023

ARKANSAS DEPARTMENT OF AGRICULTURE

OKLAHOMA CONSERVATION COMMISSION

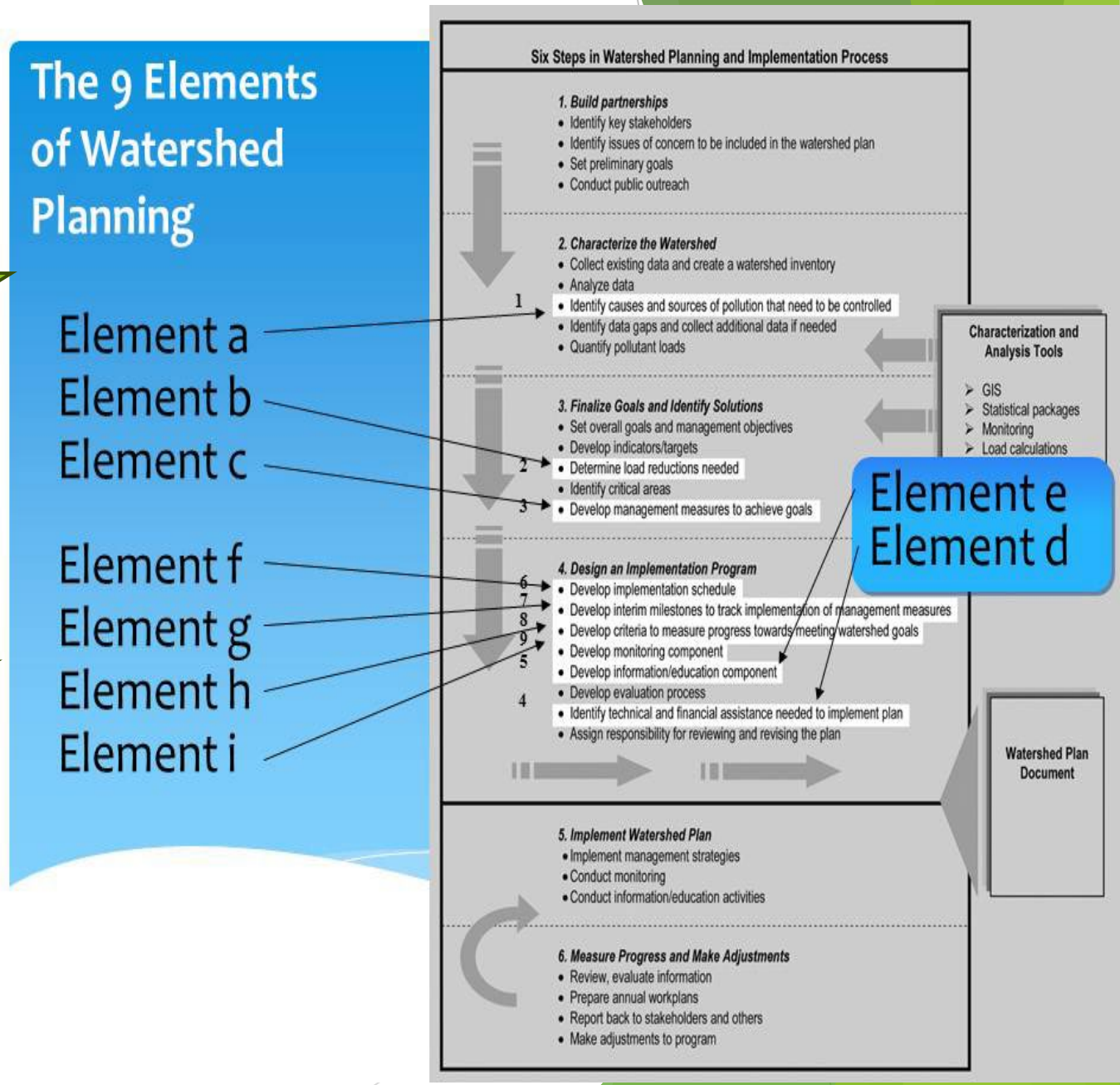
What is a Watershed Management Plan?



Watershed management planning is a process that results in a plan or a blueprint of how to best protect and improve the water quality and other natural resources in a watershed.

https://www.epa.gov/sites/default/files/2015-09/documents/2008_04_18_nps_watershed_handbook_handbook-2.pdf

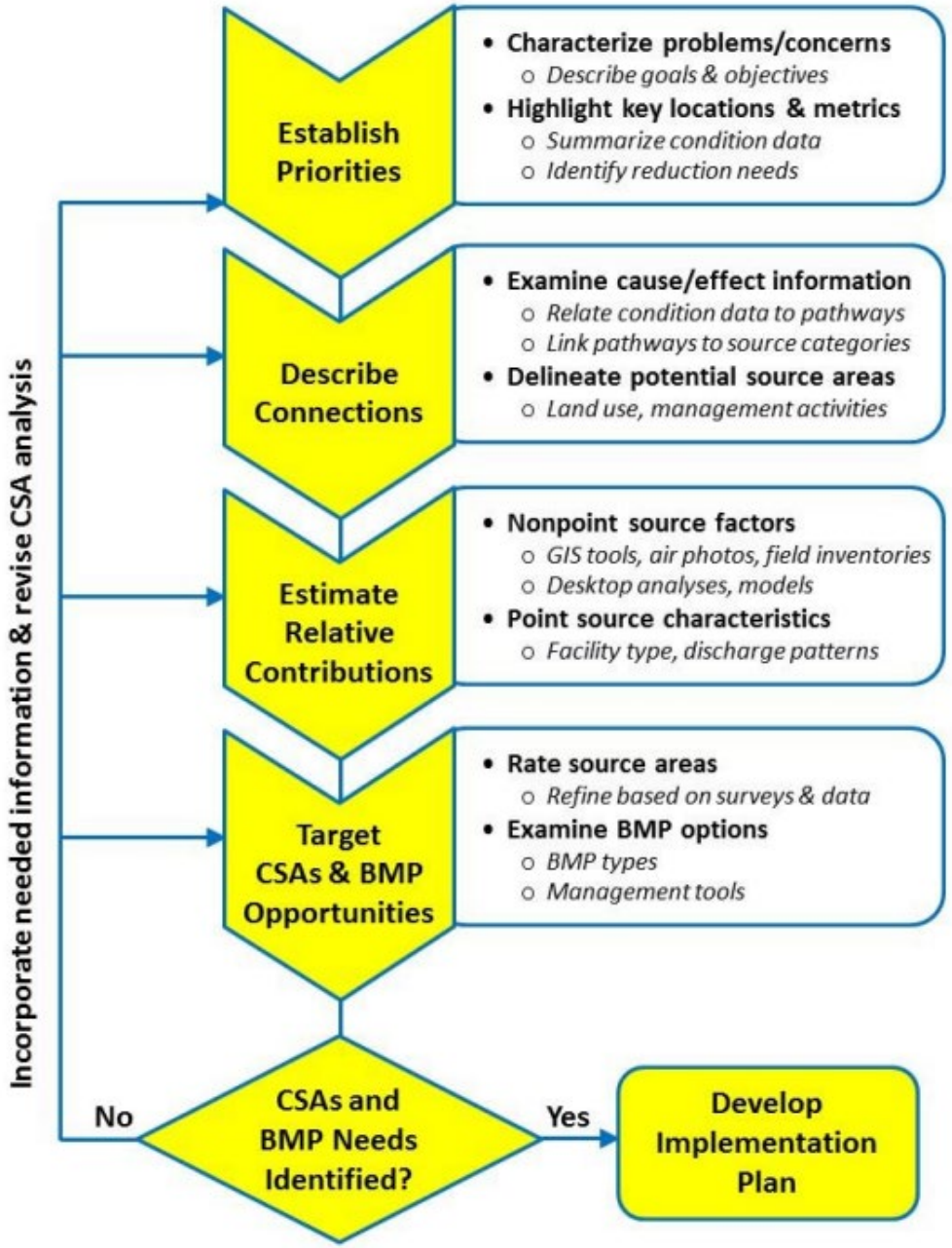
1. Element A – *Causes/Sources of Pollution Identified*
2. Element B – *Expected Load Reductions for Solutions Identified*
3. Element C – *Nonpoint Source Management Measures Identified*
4. Element D – *Technical and Financial Assistance*
5. Element E – *Education and Outreach*
6. Element F – *Implementation Schedule*
7. Element G – *Milestones Identified*
8. Element H – *Load Reduction Evaluation Criteria*
9. Element I – *Monitoring*



Critical Source Area Identification and BMP Selection: Supplement to Watershed Planning Handbook

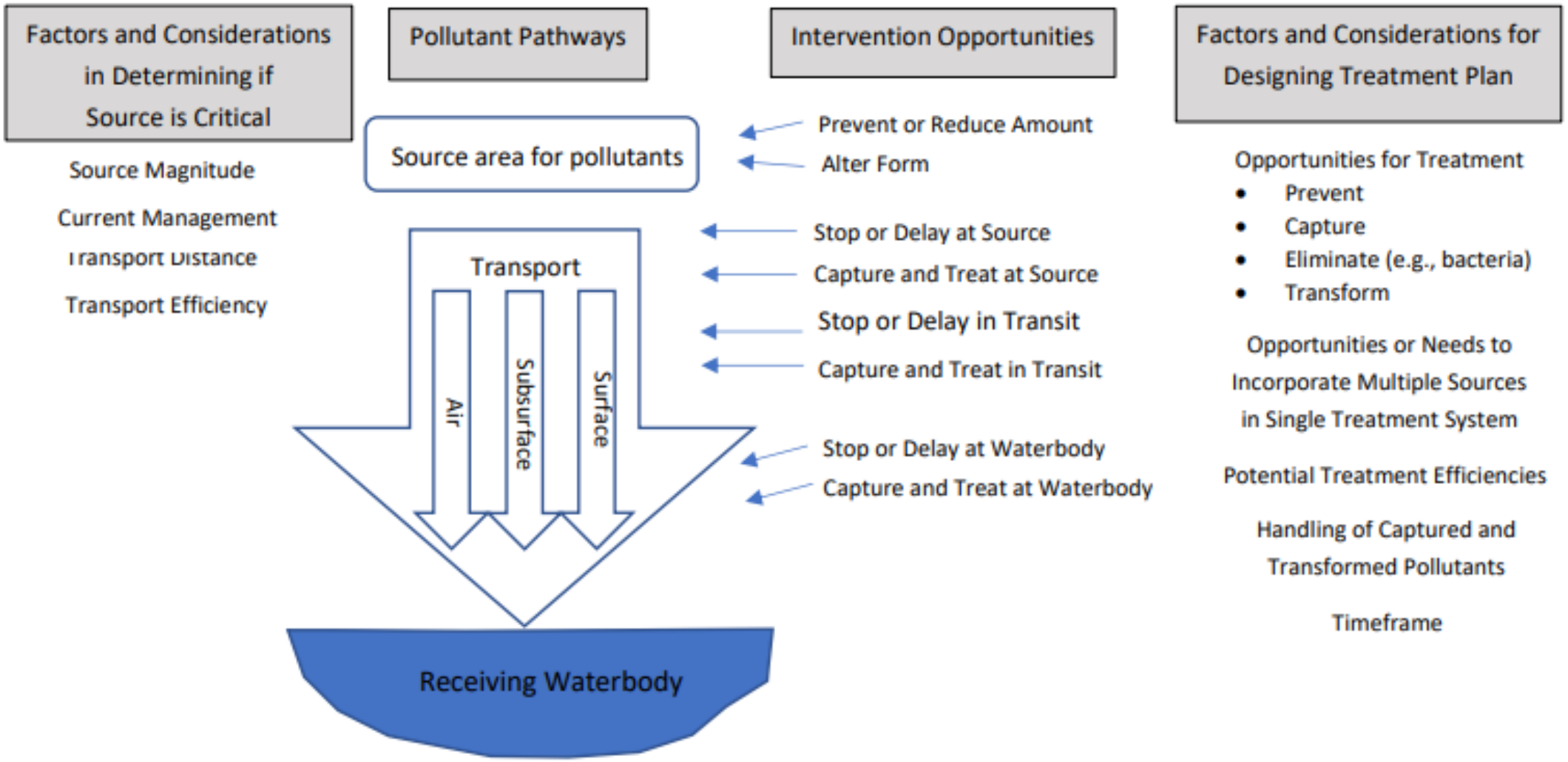
United States Environmental Protection Agency
Office of Water
Nonpoint Source Management Branch
Washington, DC 20460
EPA 841-K-18-001
July 2018

Developed under Contract to U.S. Environmental Protection Agency by Tetra Tech, Inc.
GS Contract #GS-10F-0268K
Authors: Dressing, S.A.,



https://www.epa.gov/sites/default/files/2018-08/documents/critical_source_area_identification_and_bmp_selection_final_5-11-18cover.pdf

CSA Identification and BMP Selection

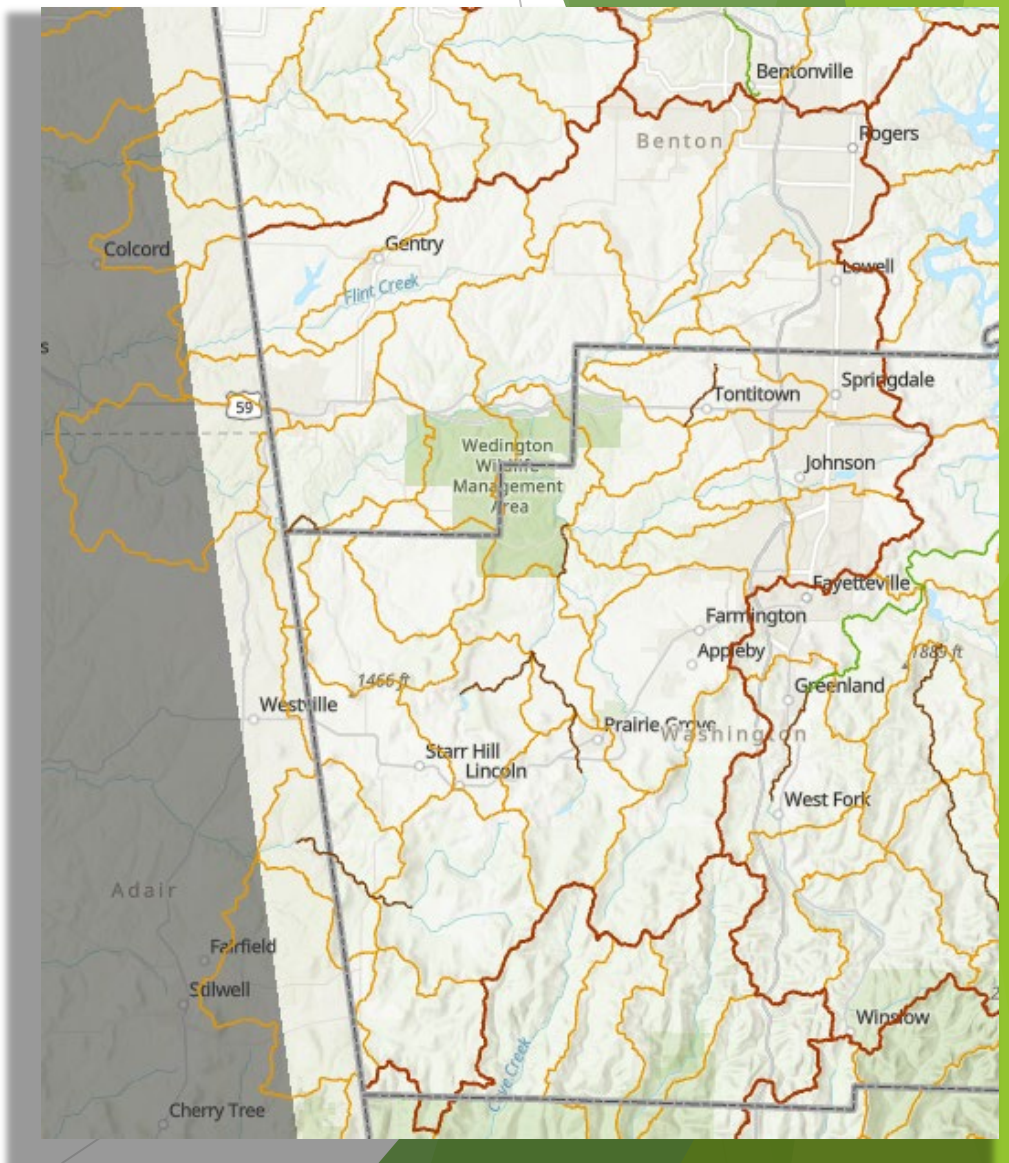


https://www.epa.gov/sites/default/files/2018-08/documents/critical_source_area_identification_and_bmp_selection_final_5-11-18cover.pdf

Establish Priorities

- Restoring impaired waters
- Protecting high-quality waters
- Directing resources/BMPs to where they are needed

Arkansas's 2022 Draft 303(d) List



Describe Connections

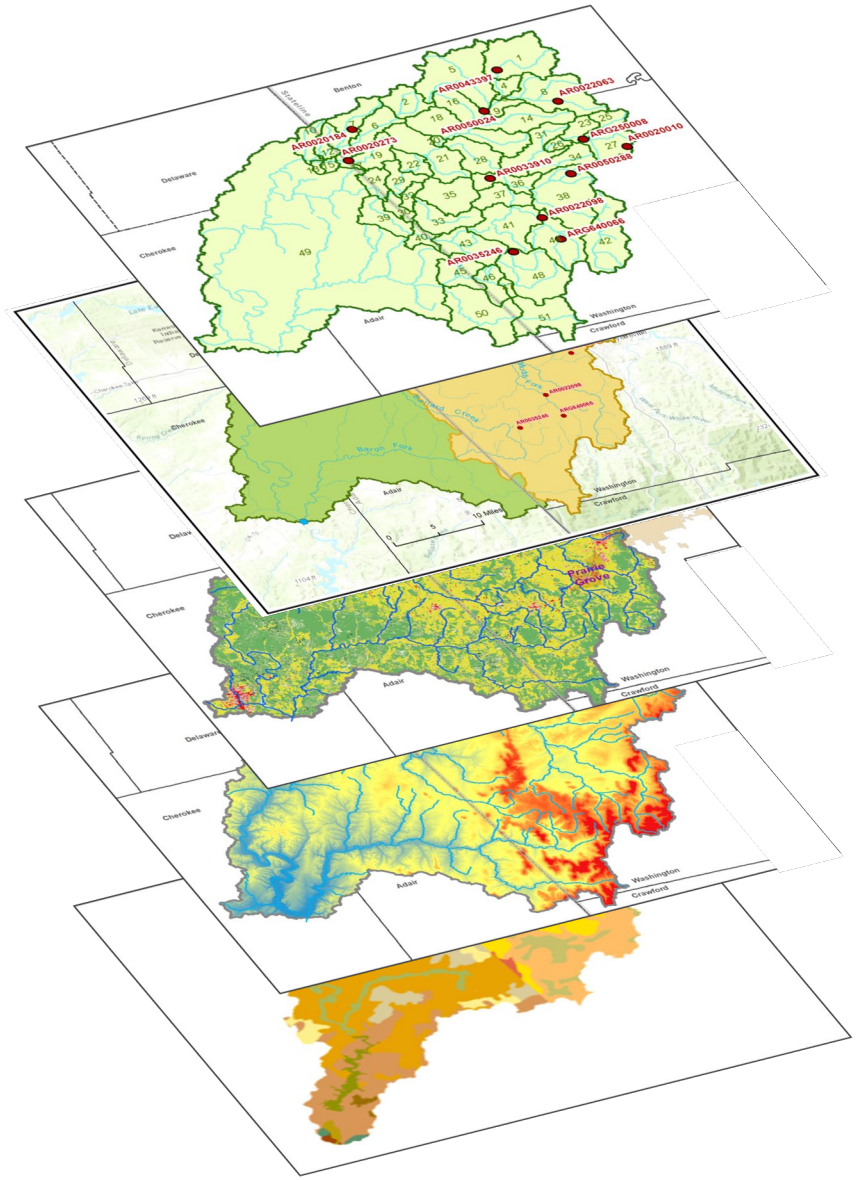
Point Sources

Weather Data

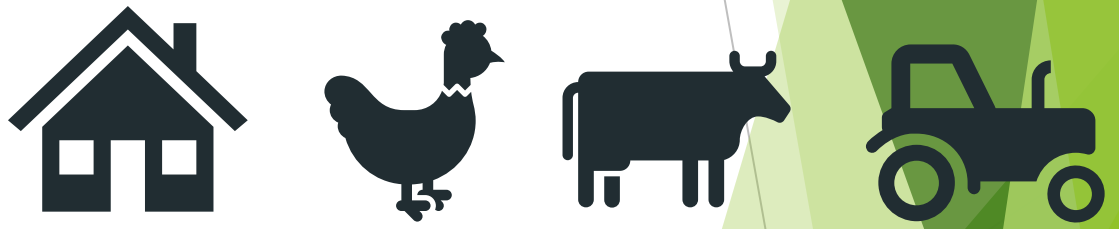
Land Cover (NLCD 2019)

Topography (DEM)

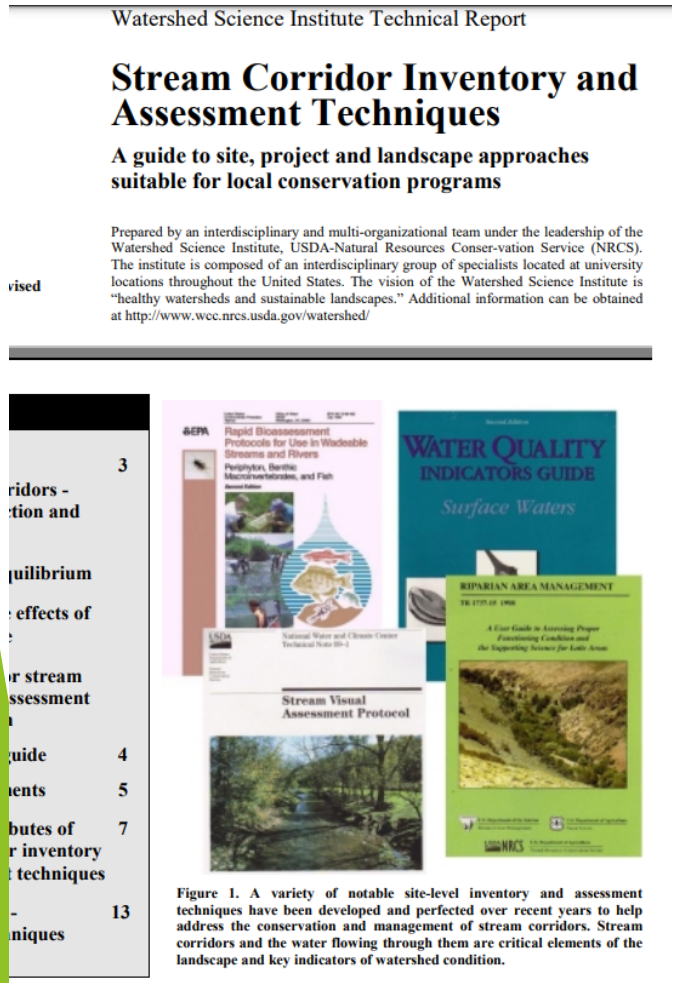
Soils (SSURGO)



Land Use and Management Practices



Estimate Contributions



Watershed Science Institute Technical Report

Stream Corridor Inventory and Assessment Techniques

A guide to site, project and landscape approaches suitable for local conservation programs

Prepared by an interdisciplinary and multi-organizational team under the leadership of the Watershed Science Institute, USDA-Natural Resources Conser-vation Service (NRCS). The institute is composed of an interdisciplinary group of specialists located at university locations throughout the United States. The vision of the Watershed Science Institute is "healthy watersheds and sustainable landscapes." Additional information can be obtained at http://www.wcc.nrcs.usda.gov/watershed/

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Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers

Periphyton, Benthic Macroinvertebrates, and Fish

WATER QUALITY INDICATORS GUIDE

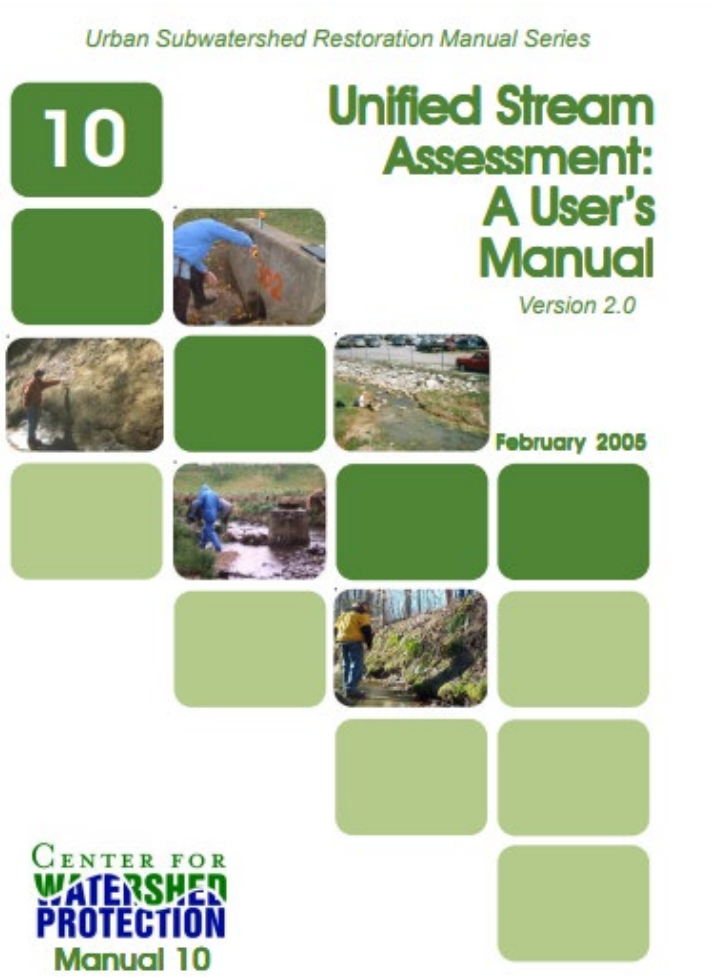
Surface Waters

RIPARIAN AREA MANAGEMENT

Stream Visual Assessment Protocol

Figure 1. A variety of notable site-level inventory and assessment techniques have been developed and perfected over recent years to help address the conservation and management of stream corridors. Stream corridors and the water flowing through them are critical elements of the landscape and key indicators of watershed condition.

https://www.wcc.nrcs.usda.gov/ftpref/wntsc/strmRest/StreamCorridorInventoryTechniques.pdf



Urban Subwatershed Restoration Manual Series

10

Unified Stream Assessment: A User's Manual

Version 2.0

February 2005

Center for Watershed Protection

Manual 10

https://owl.cwp.org/mdocs-posts/urban-subwatershed-restoration-manual-series-manual-10/

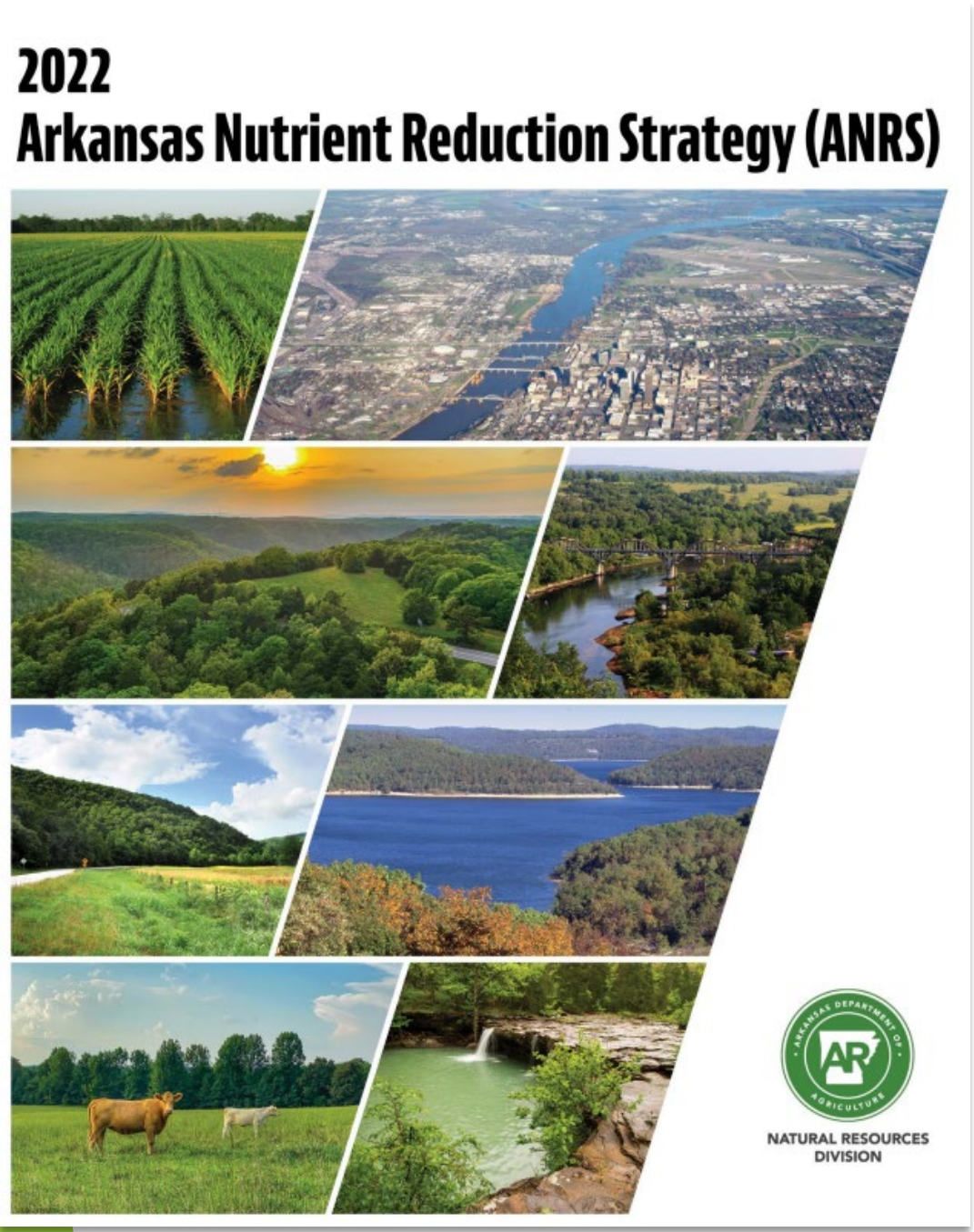
- Inspection/validation of sub-watershed contribution assumptions
- Consideration of overlooked contributions
- Quantitative/Qualitative assessments

BMP Selection

https://www.epa.gov/water-research/best-management-practices-bmps-siting-tool

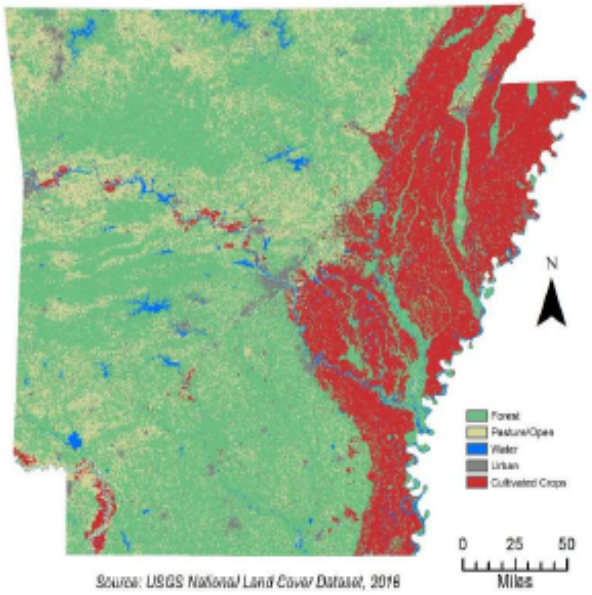
https://bmpdatabase.org/

https://farmlandinfo.org/media/outcomes-estimation-tools-training-webinar-series/



ARKANSAS NUTRIENT REDUCTION MEASUREMENT FRAMEWORK:

NUTRIENT REDUCTION EFFICIENCIES FOR SELECTED AGRICULTURAL MANAGEMENT PRACTICES



MAY 24, 2019

https://www.agriculture.arkansas.gov/wp-content/uploads/2022/07/2022-7-21-ANRS-FINAL-PUBLISH.pdf

Example Target CSA's and BMP Opportunities

Practice	*E. coli* Reduction	Sediment Reduction	Total N Reduction	Total P Reduction
Prescribed grazing	65%	30%	10%	15%
Stream exclusion/ controlled access	45%	60%	10%	15%
Alternative water facility	70%	30%	10%	15%
Herbaceous riparian buffer	50%	60%	35%	35%
Forest riparian buffer	50%	60%	35%	35%

Inputs

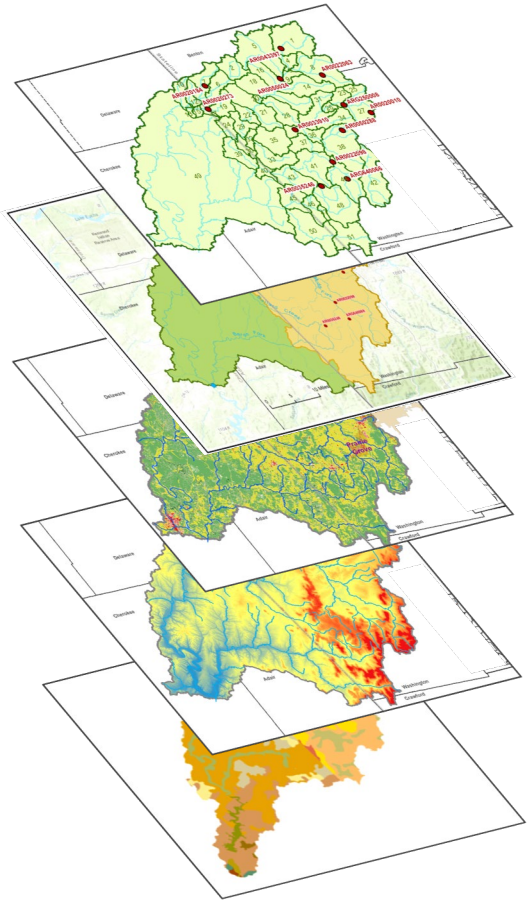
Point Sources

Weather Data

Land Use (NLCD 2019)

Topography (DEM)

Soils (SSURGO)



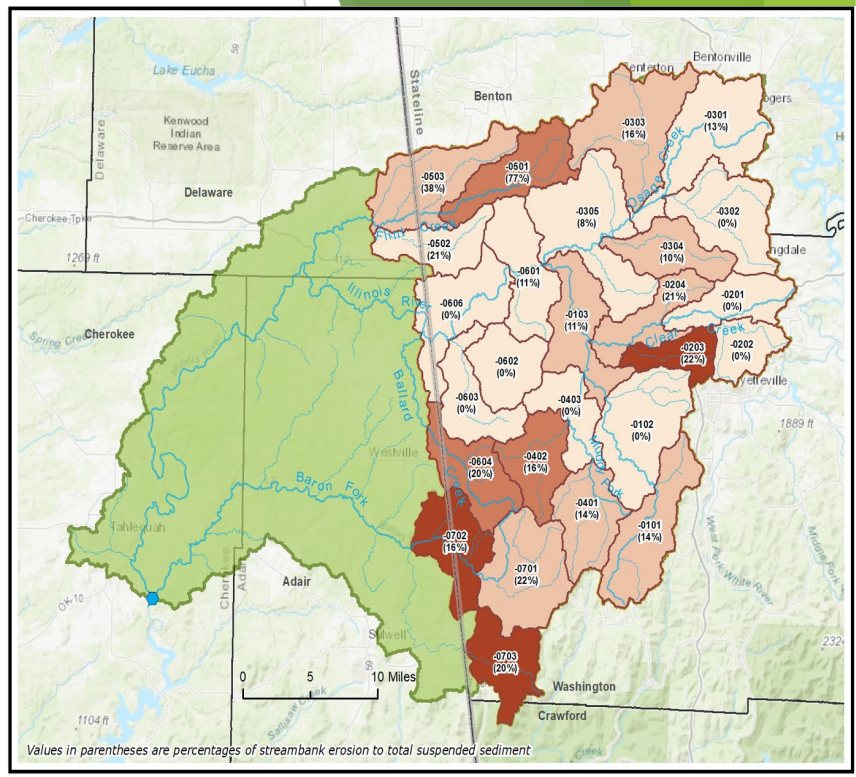
SWAT Model

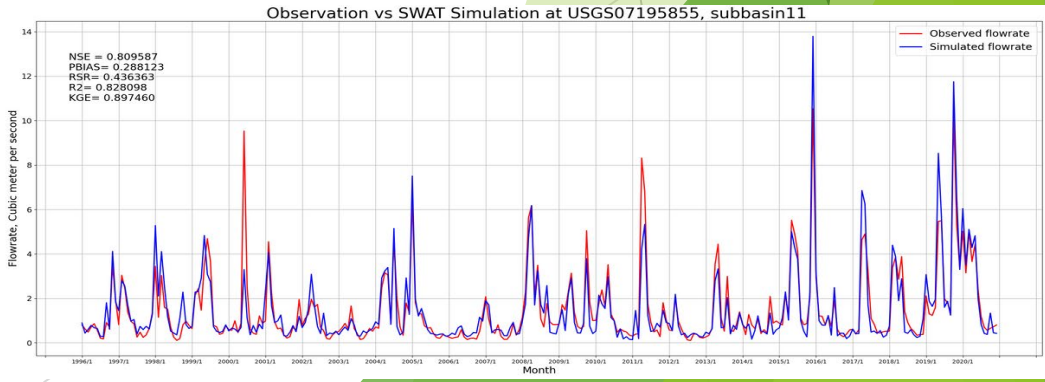
Soil & Water Assessment Tool | SWAT

Land Management Practices

Output

Sediment and Nutrient Loads

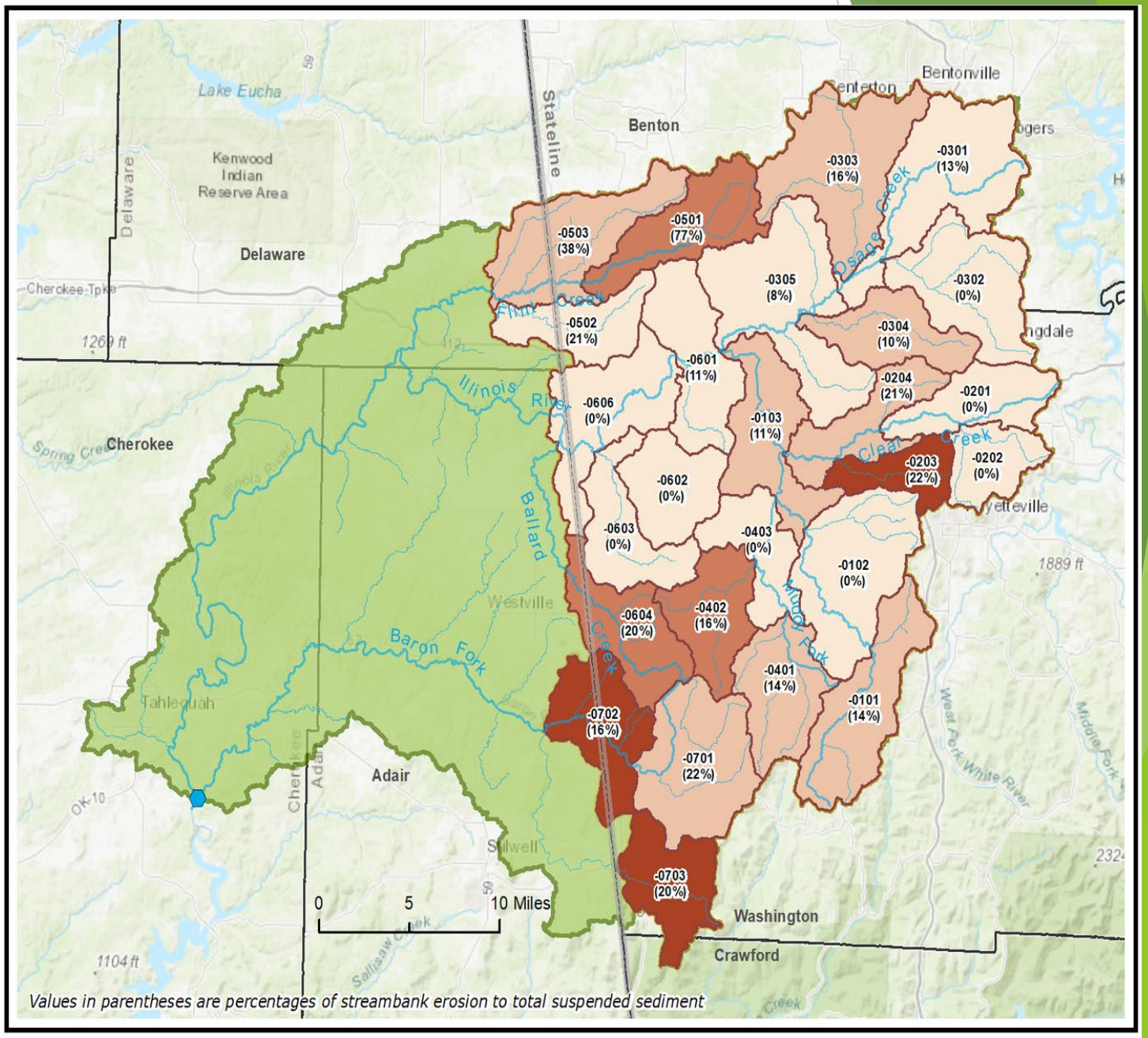




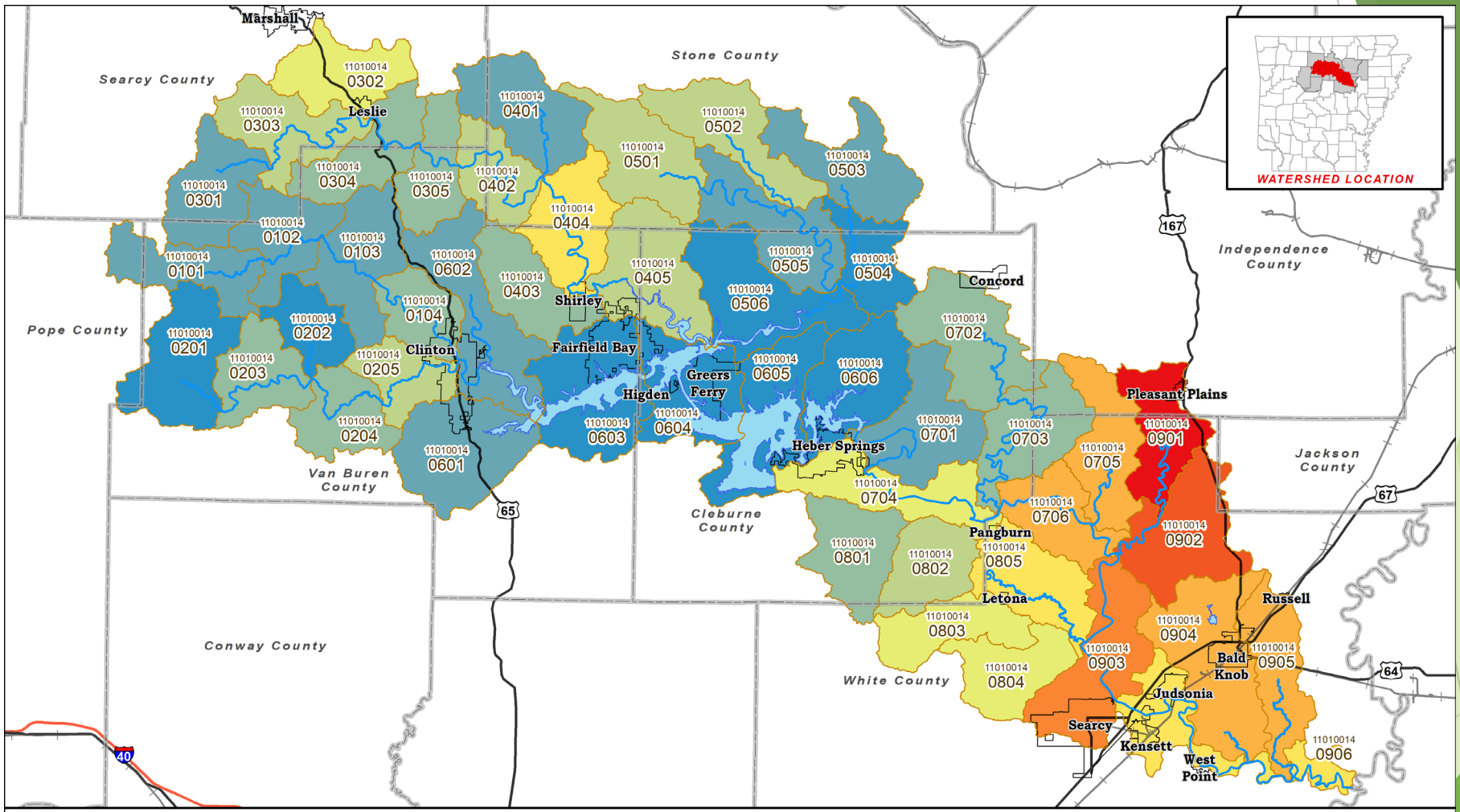
IRW Sub-Basin Prioritization

Sediment Loads

- %tile ranks among sub-basins



Example Sub-Basin Prioritization



Example Target CSA's and BMP Opportunities

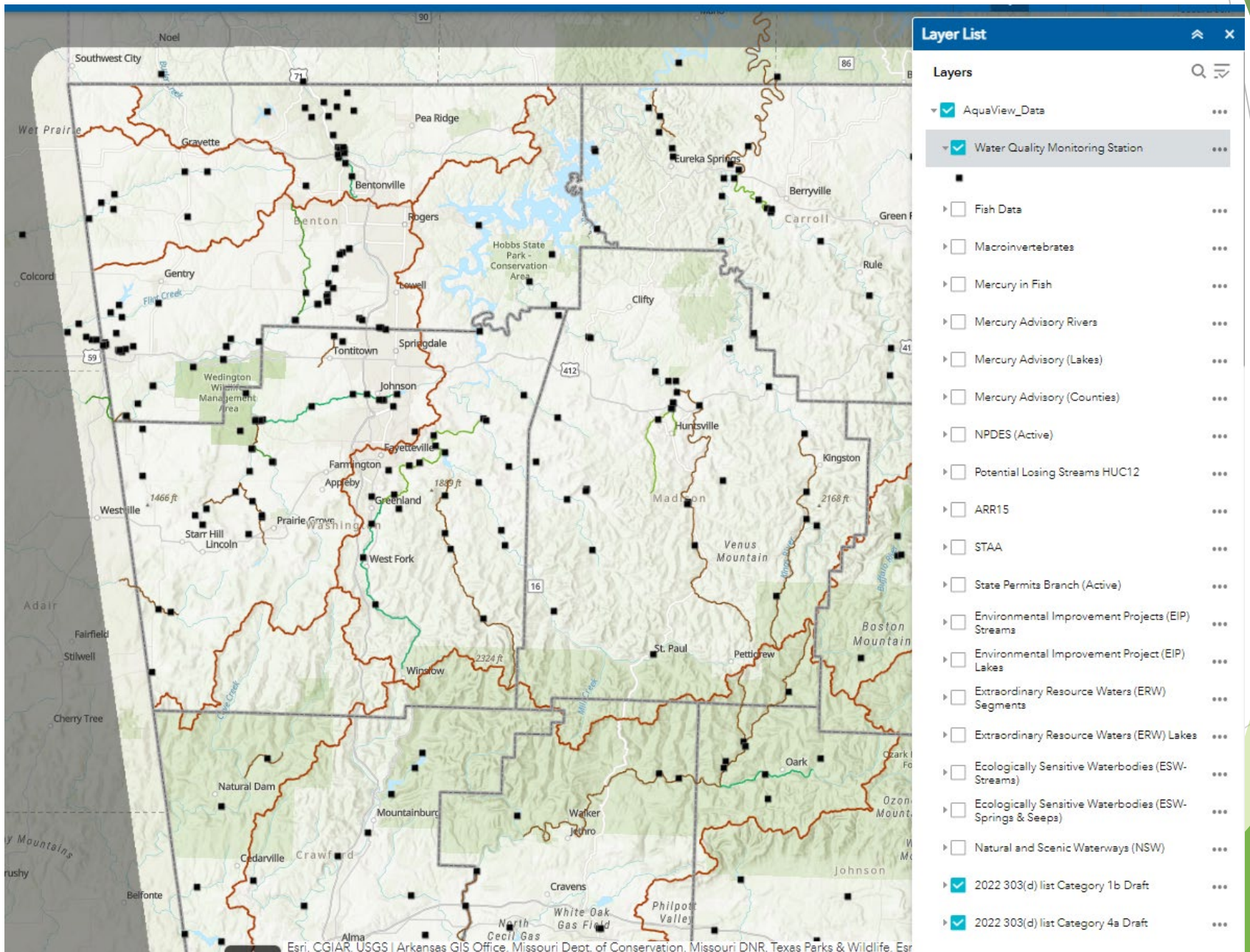
Table. 4.6. DEQ ecoregion nutrient assessment values (75th percentiles) (J. Martin, DEQ, personal communication, 9/29/22; B. Olsen, DEQ, personal communication, 11/30/22).

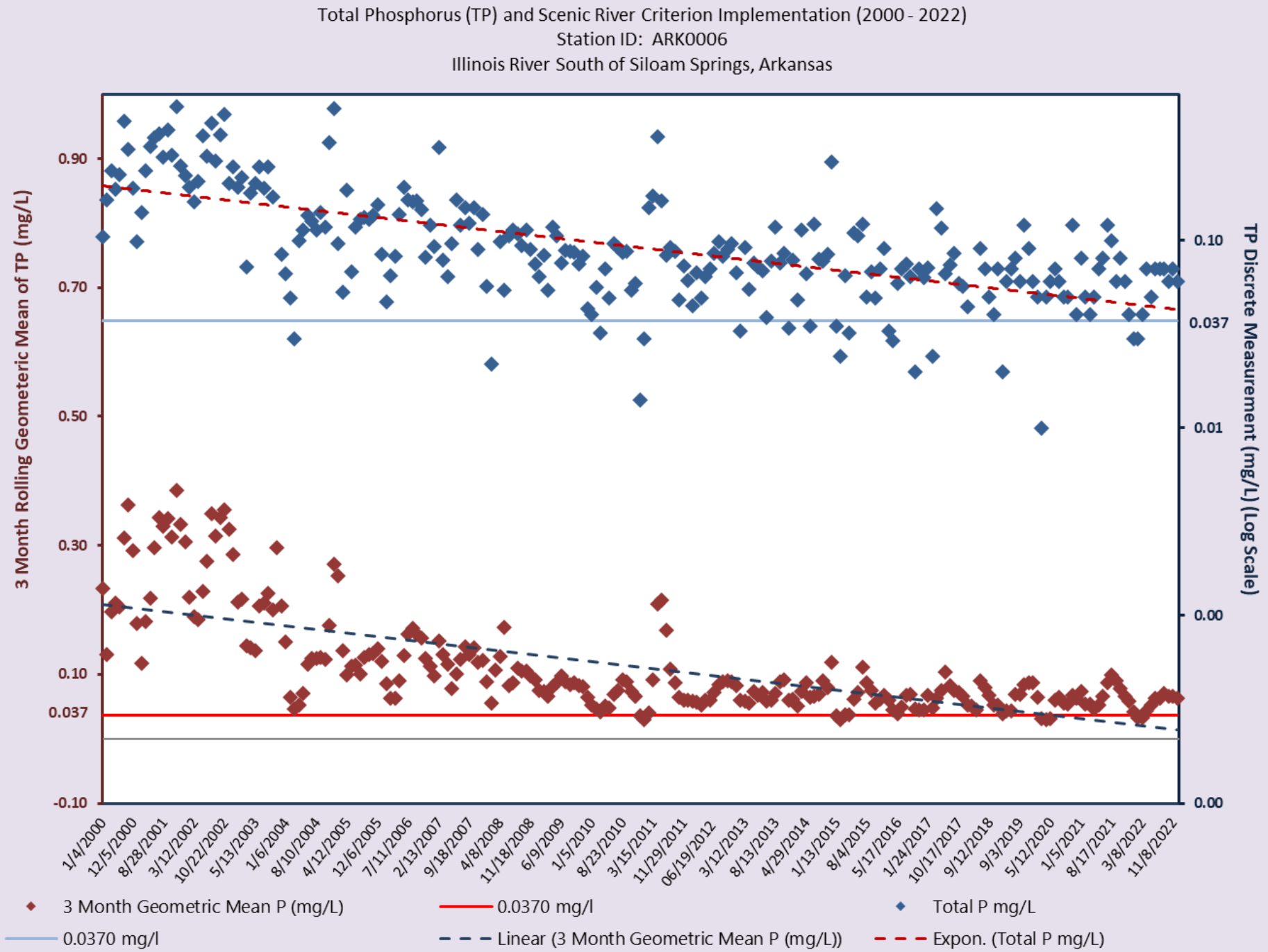
Ecoregion	Total Nitrogen 75th percentile	Total Phosphorus 75th percentile
Arkansas River Valley	1.04 mg/L	0.110 mg/L
Delta	1.46 mg/L	0.34 mg/L

Table 4.11. Total phosphorus load reduction target calculations.

Station ID	WHI0059	UWTMC01	UWOFC01	WHI0199
Stream Name	Little Red River	Ten Mile Creek	Overflow Creek	Mingo Creek
HUC12 ID	110100140706, 110100140903	110100140901, 110100140902	110100140904	110100140905
HUC12 Name	Little Red River - Cedar Br, Little Red River - Alder Cr	Headwaters Ten Mile Creek, Outlet Ten Mile Creek	Overflow Creek	Big Mingo Creek
DEQ Ecoregion	Arkansas River Valley	Arkansas River Valley	Arkansas River Valley	Delta
Assessment period	2016-2020	2001-2003	2011-2012	2011-2013
Number of total phosphorus values	52	12	5	8
Number of total phosphorus values > assessment value	2	2	0	0
Maximum value	0.171 mg/L	0.51 mg/L	0.096 mg/L	0.257 mg/L
Reduction factor so all total phosphorus values < assessment value	0.36	0.78	0	0

Monitoring Progress




Total Phosphorus (TP) and Scenic River Criterion Implementation (2000 - 2022)
Station ID: ARK0006
Illinois River South of Siloam Springs, Arkansas
3 Month Rolling Geometeric Mean of TP (mg/L)
TP Discrete Measurement (mg/L) (Log Scale)
0.90
0.70
0.50
0.30
0.10
0.037
-0.10
0.10
0.037
0.01
0.00
0.00
1/4/2000
12/5/2000
8/28/2001
3/12/2002
10/22/2002
5/13/2003
1/6/2004
8/10/2004
4/12/2005
12/6/2005
7/11/2006
2/13/2007
9/18/2007
4/8/2008
11/18/2008
6/9/2009
1/5/2010
8/23/2010
3/15/2011
11/29/2011
06/19/2012
3/12/2013
8/13/2013
4/29/2014
1/13/2015
8/4/2015
5/17/2016
1/24/2017
10/17/2017
9/12/2018
9/3/2019
5/12/2020
1/5/2021
8/17/2021
3/8/2022
11/8/2022
3 Month Geometric Mean P (mg/L)
0.0370 mg/l
Total P mg/L
0.0370 mg/l
Linear (3 Month Geometric Mean P (mg/L))
Expon. (Total P mg/L)

Tate Wentz

Water Quality Section Manager

Arkansas Department of Agriculture

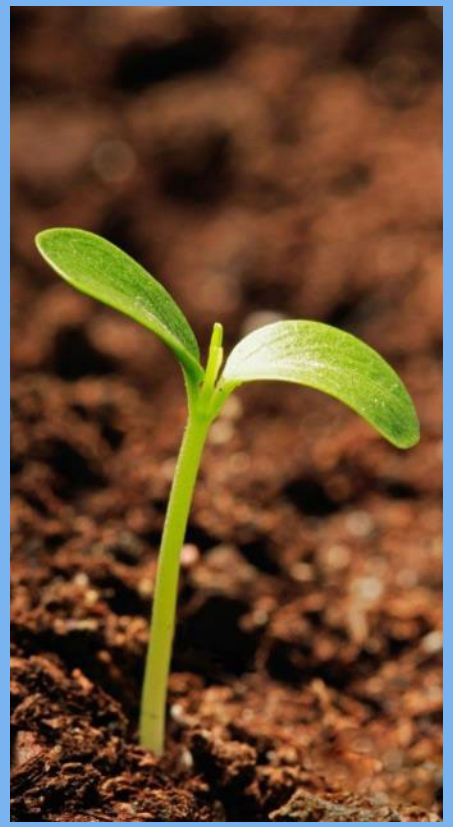
Natural Resources Division

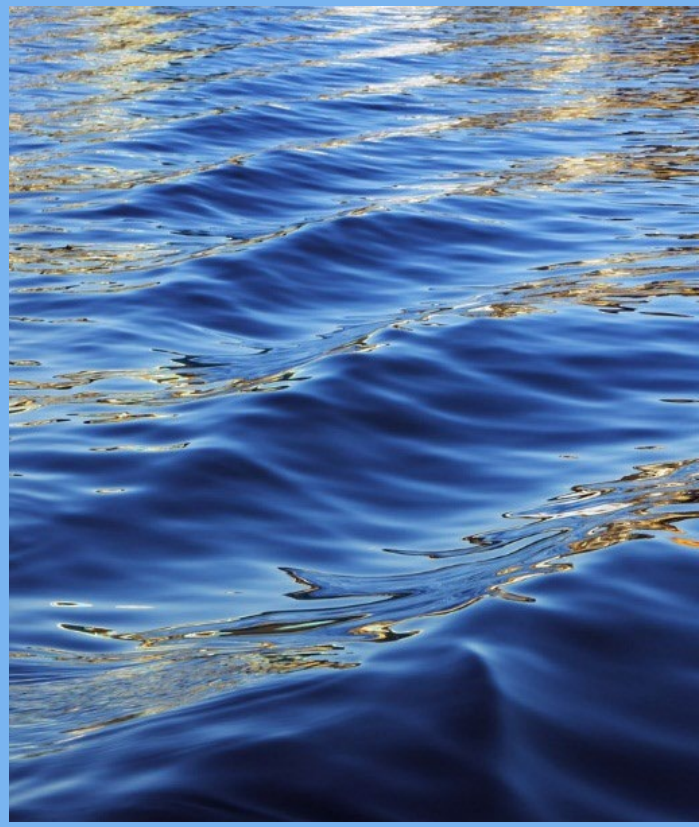
O: 501-682-3914 | M: 501-366-6575

Tate.Wentz@agriculture.arkansas.gov

Use of OK HAWQS, a Web-Based Tool for Critical Source Area Identification in Oklahoma

Shanon Phillips
Oklahoma Conservation Commission





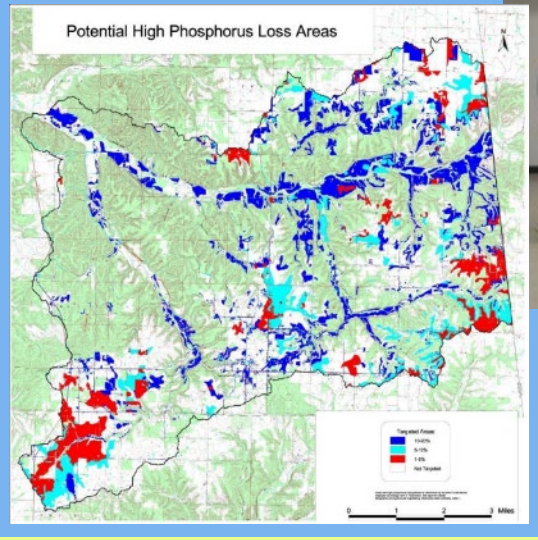
OKLAHOMA WATER RESOURCES CENTER

OKLAHOMA CONSERVATION COMMISSION

AgriLIFE RESEARCH
Texas A&M System

In the good(?) old days, Critical Source ID might include…

- Driving every road mile in the watershed
- Stream walks to assess streamside sources
- Landowner/stakeholder surveys
- $100,000+ per watershed modeling



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If it ain't broke…?

- Oklahoma statutes require watershed-based nonpoint source pollution control activities…" i.e. for the whole state
- Need for modeling at the HUC 12 scale (ave 23,000 acres)
- Need to update and share models
- Developing independent models for each watershed is costly and time-consuming
- Stakeholders need a tool they can use to help evaluate/predict/prioritize programs

OKLAHOMA CONSERVATION COMMISSION

What is HAWQS ?

Reference: https://hawqs.tamu.edu/#/

AgriLIFE RESEARCH
Texas A&M System

The SWAT Model

- Hydrologic and Water Quality System (HAWQS)
- Developed by TX A&M for EPA
- Establishes a baseline SWAT model hydrologically and chemically calibrated at the HUC 8 (avg. 256,000 acre) scale
- Open-sourced
- Input data continuously updated by TX A&M
- HAWQS models are publicly available and permanently stored
- Other models (lakes, groundwater, etc.) can be linked & stored in HAWQS

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https://ok.hawqs.tamu.edu/#/

OK.HAWQS

Hydrologic and Water Quality System
Oklahoma Watershed and Water Quality Assessment Tool

Log in Documentation & Support

HAWQS is a web-based interactive water quantity and quality modeling system that employs as its core modeling engine the Soil and Water Assessment Tool (SWAT), an internationally-recognized public domain model. HAWQS provides users with interactive web interfaces and maps; pre-loaded input data; outputs that include tables, charts, and raw output data; a user guide, and online development, execution, and storage of a user's modeling projects.

HAWQS substantially enhances the usability of SWAT to simulate the effects of management practices based on an extensive array of crops, soils, natural vegetation types, land uses, and other scenarios for hydrology and the following water quality parameters:

- Sediment
- Pathogens
- Nutrients
- Biological oxygen demand
- Dissolved oxygen
- Pesticides
- Water temperature

HAWQS users can select from several models around the globe to run simulations, and upload their own SWAT models for public use. HAWQS allows for further aggregation and scalability of daily, monthly, and annual estimates of water quality across large geographic areas.

The Texas A&M University Spatial Sciences Laboratory subject matter experts provide ongoing technical support including system design, modeling, and software development. The United States Department of Agriculture (USDA) and Texas A&M University jointly developed SWAT and have actively supported the model for more than 25 years.

For HAWQS data usage and paper citation, please reference the following:

HAWQS 2.0, 2023, "HAWQS System 2.0 and Data to model the lower 48 conterminous U.S using the SWAT model", doi.org/10.18738/T8/GDOPBA, Texas Data Repository, V2

In the media:

- Watch on YouTube: How Can You Use the Oklahoma Hydrologic and Water Quality System?
- Press release April 5, 2023: Web-based watershed assessment tool is a global resource

Oklahoma Conservation Commission | OSU Oklahoma Water Resources Center | Texas A&M AgriLife Research | Texas A&M University | USDA ARS Agricultural Research Service

This project was jointly sponsored by the OCC, OSU, the USDA Agricultural Research Service, and Texas A&M AgriLife Research.

For assistance with account settings and system errors, please contact eco.web@tamu.edu.

Oklahoma Conservation Commission

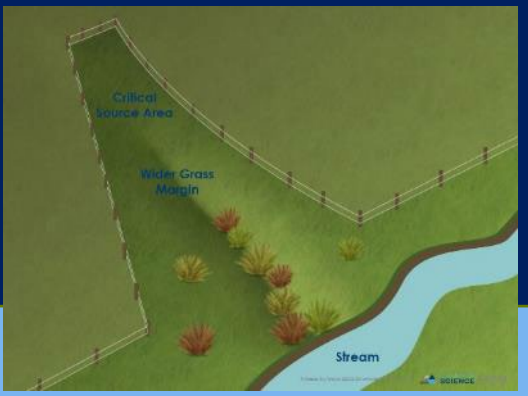
Strengths and Limitations of OK - HAWQS

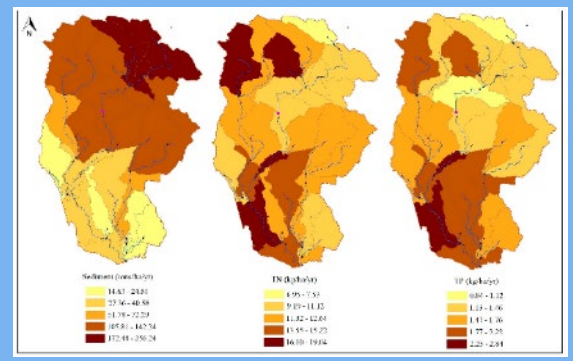
- **Strengths-**
  - Public domain, automatic data updates
  - No GIS software or knowledge required
  - "Standard" assessments + additional tools for complex analyses
  - Can link to other models
  - Calibrated
  - **90% reduction in time and effort for SWAT-based environmental assessments**
- **Limitations-**
  - Available data may be limited
    - Spatial/temporal
    - Flow separation
    - Land management
  - Limitations inherent to SWAT
    - Daily estimates using monthly input data
    - Routing pollutants through subbasins
    - In-stream pollutant dynamics

OKLAHOMA CONSERVATION COMMISSION

Applications of OK - HAWQS

- Identify critical source areas
- Test conservation practice scenarios
- Test how changing watershed impacts water quantity
  - Climate change
  - Urbanization
  - Etc.
- Help visualize challenges

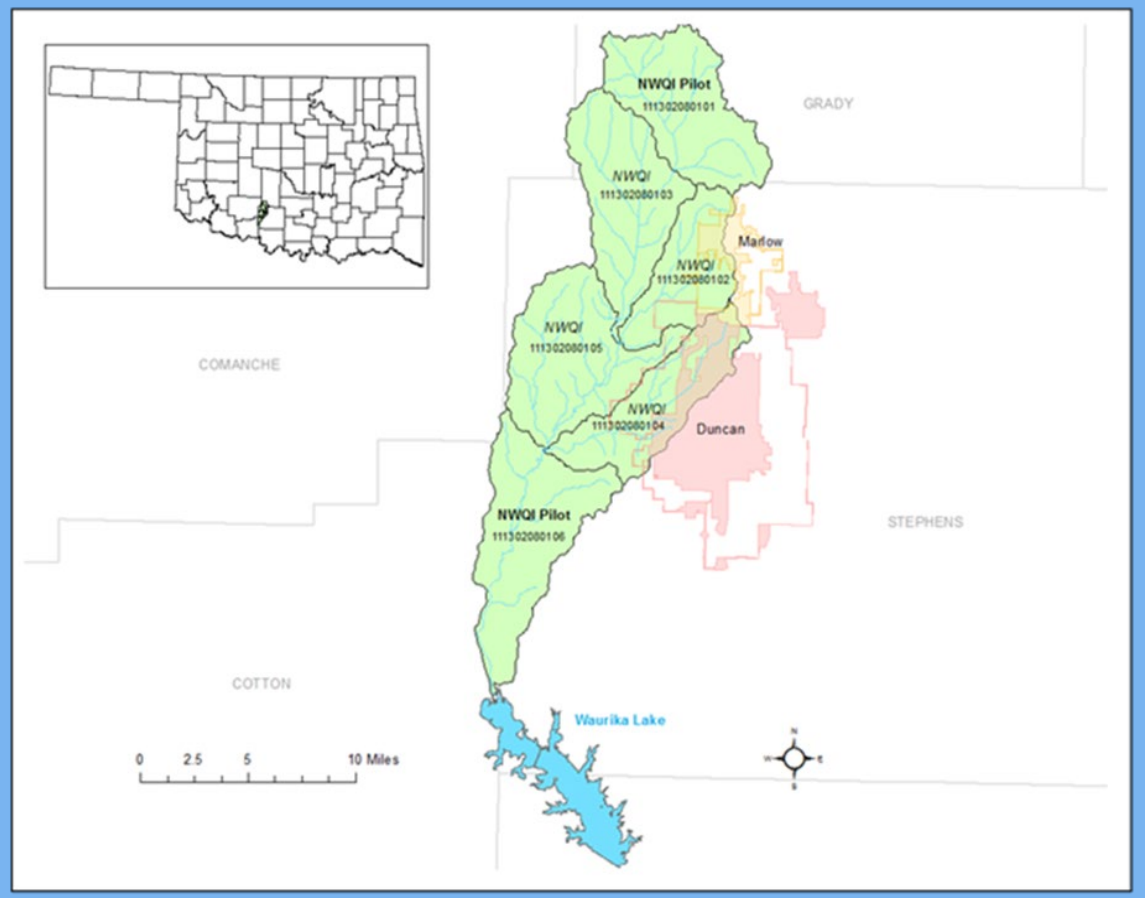




OKLAHOMA CONSERVATION COMMISSION

Examples of OK HAWQS/SWAT Application for Critical Source ID: Little Beaver Creek

- Impaired for bacteria, total dissolved solids, and benthic macroinvertebrates
- USDA NRCS National Water Quality Initiative (NWQI) Watershed
- Landuse: Range (63%) & Cropland (22%)



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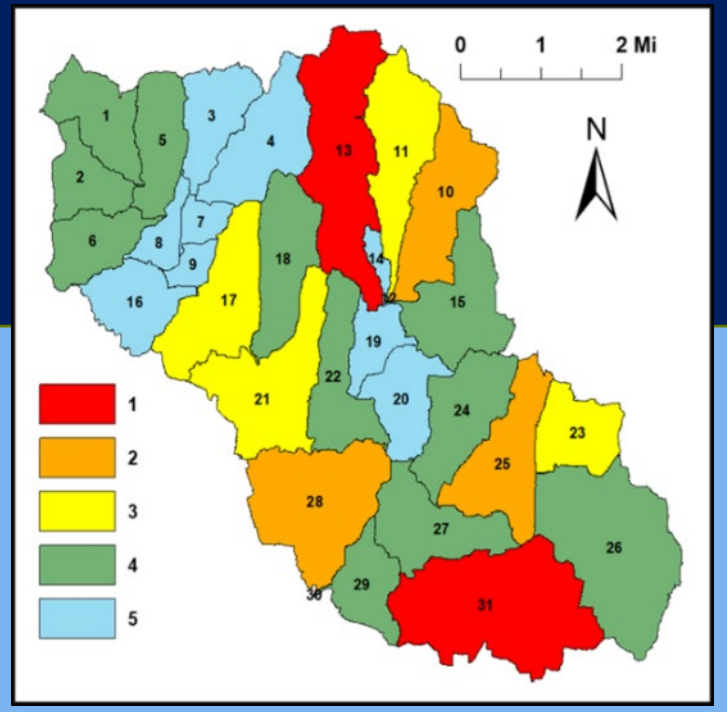
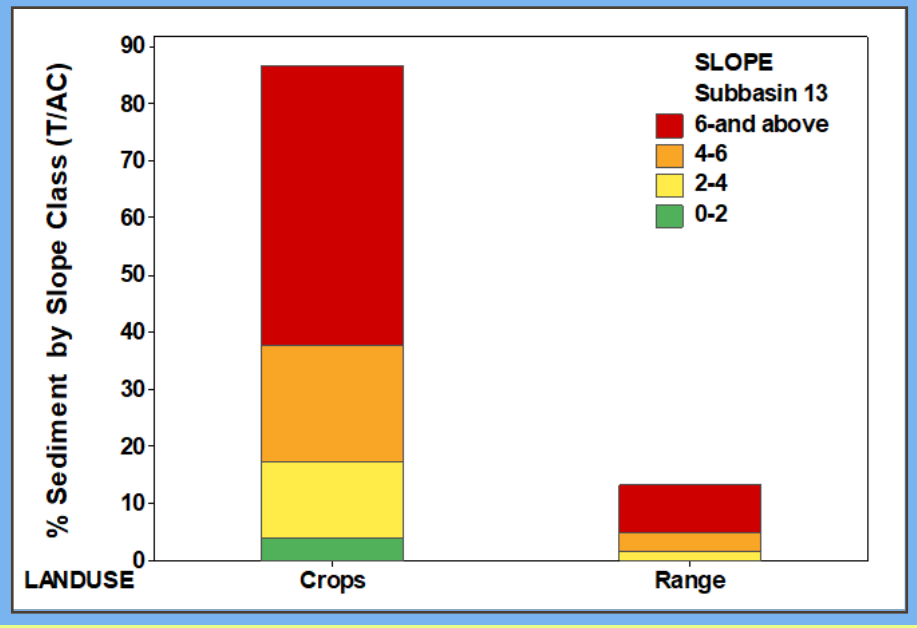
Little Beaver NWQI Project

- HAWQS outputs used to ID critical source regions in each contributing HUC12 watershed
- HAWQs model predicts pollutant loading by Landuse category
- Demo HAWQS reliability to local NRCS through ground-truthing
- NRCS uses HAWQS predictors to target landowners for EQIP/NWQI funding



Priority Classification of Headwaters of Little Beaver Creek- upper-most HUC 12- Most critical (1) to least critical (5)



Sediment contributions by landuse and slope

OKLAHOMA CONSERVATION COMMISSION

Little Beaver NWQI- Practice Installation Begins in 2014

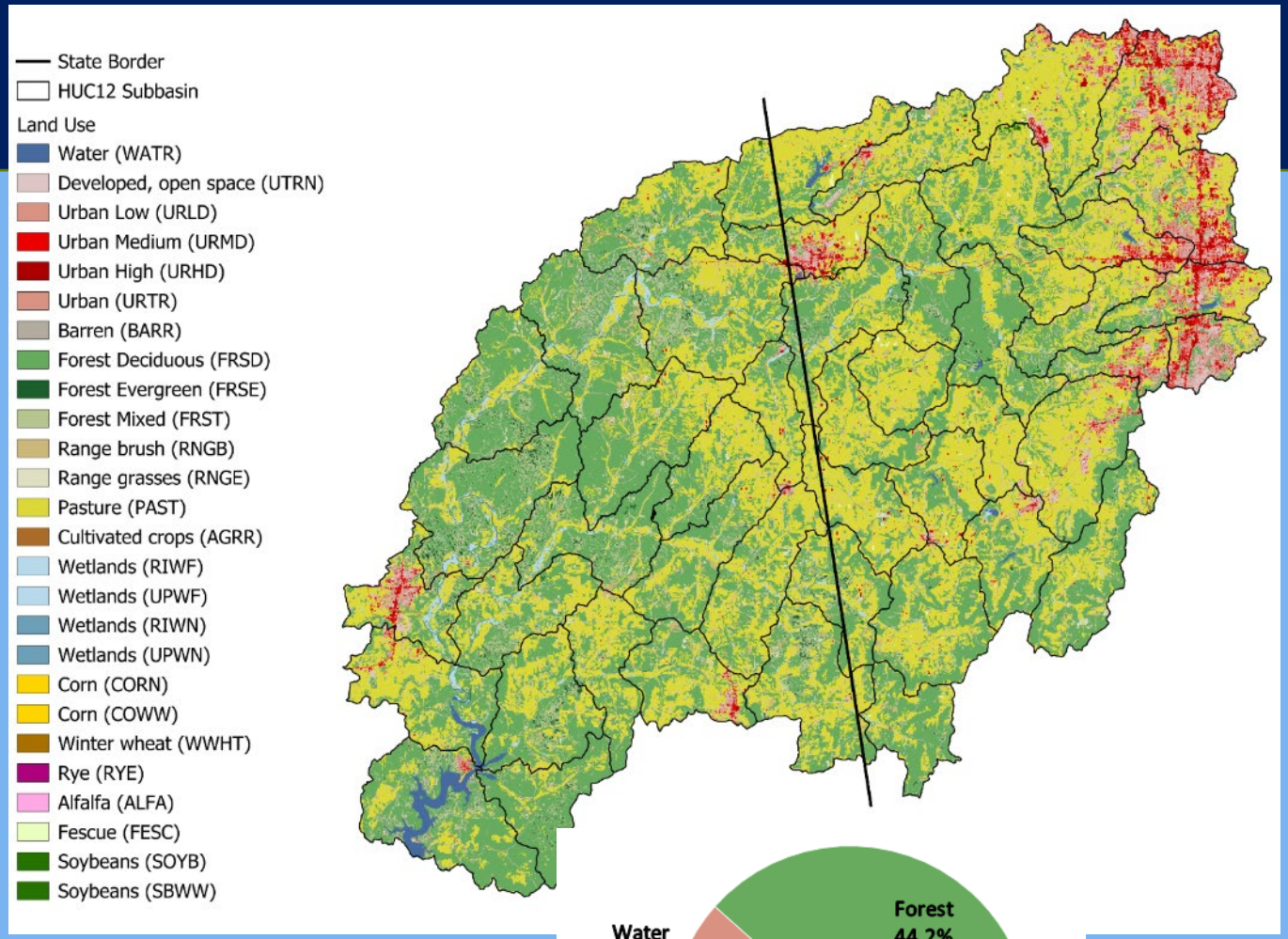
- Enrolled 43 landowners in contracts
- Installed practices on at least 6400 acres
- Delisted stream for E.coli in 2020

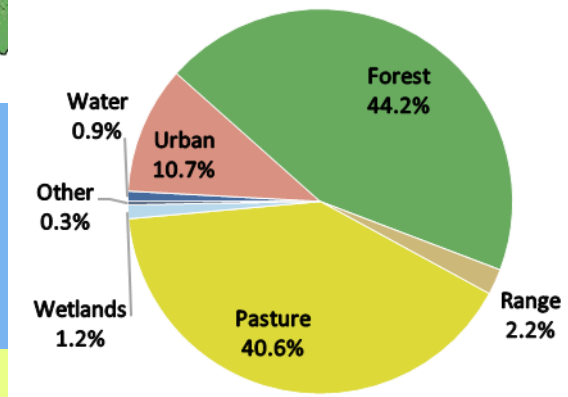
Little Beaver E. coli Concentrations		
Years	E. coli Geomean (cfu/100 ml)	N
2004-06	285.5	10
2009-11	212.3	9
2014-16	149.2	10
2016-18	132.6	13
2018-20	111.7	9
2020-22	65.77	9
2022-23	80.5	10

OKLAHOMA CONSERVATION COMMISSION

Critical Source ID with HAWQS: Illinois River Watershed

- Two-state watershed
- Long history of water quality protection/restoration programs
- Priority for both states
- Need to update management plans



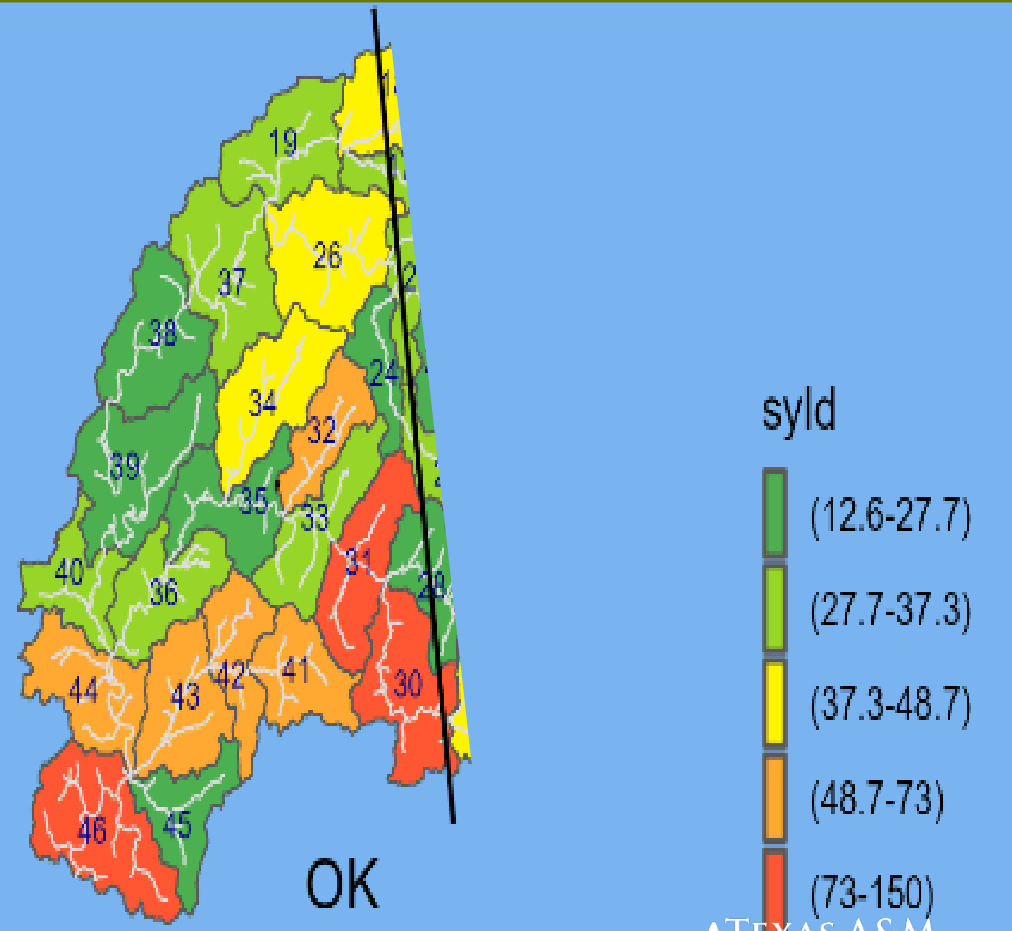


OKLAHOMA CONSERVATION COMMISSION

OK HAWQS Illinois River Application

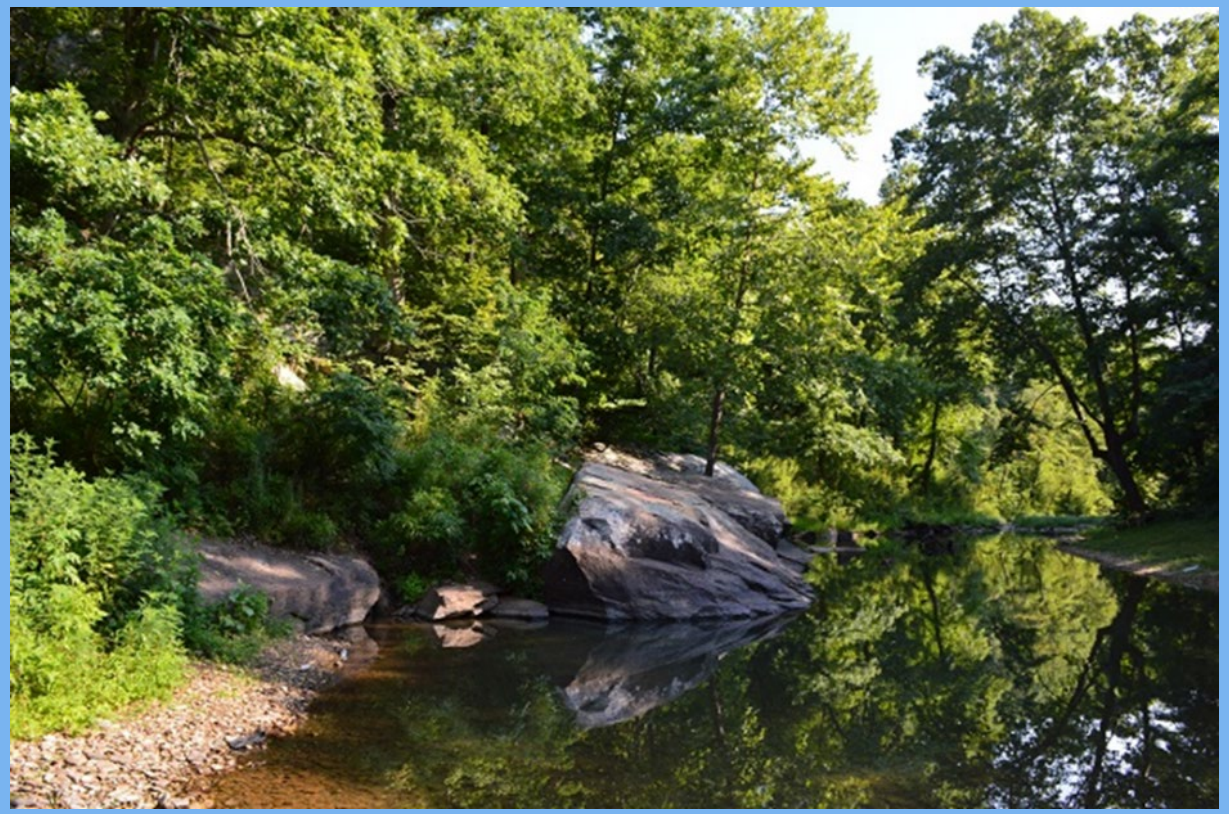
- Predict areas contributing most to sediment and nutrient loads
- Simulate benefits (relative) of conservation practice installation
- Evaluate implementation needs to achieve water quality standards
- Guide stakeholders in updating watershed plans

Total Sediment to the River



TEXAS A&M AGRILIFE RESEARCH

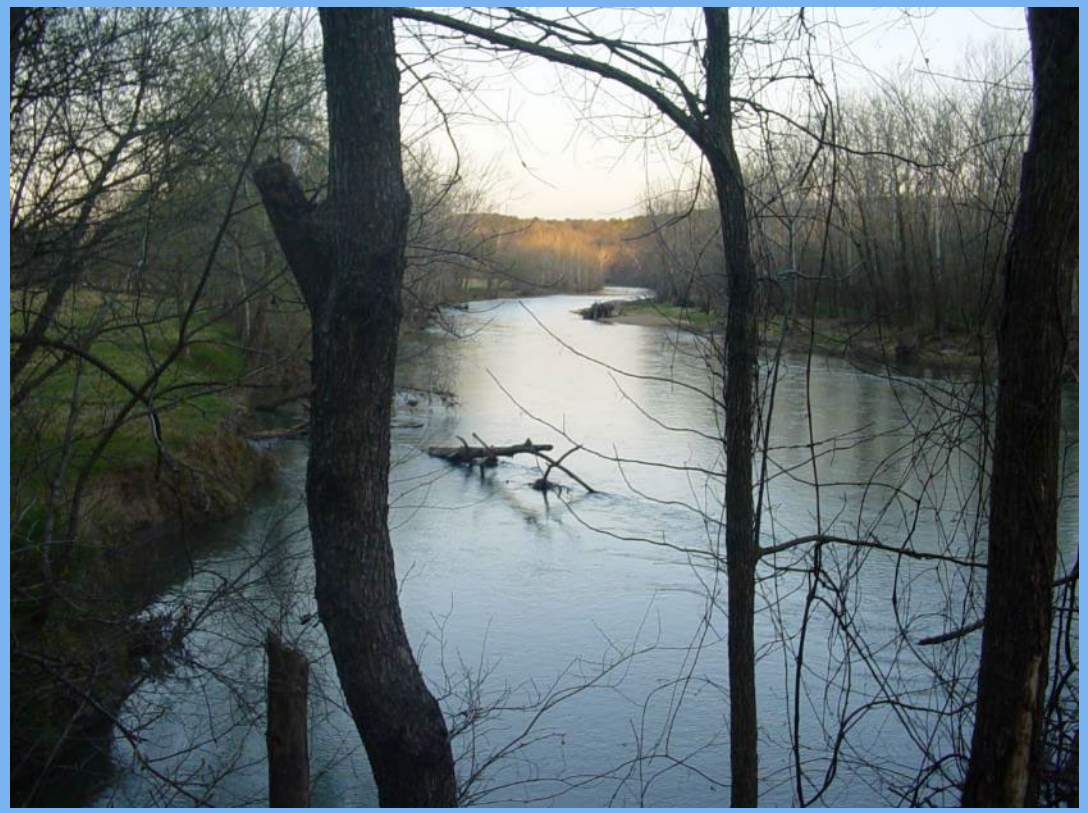
Illinois River HAWQS development enabled improvements to HAWQS (National and OK HAWQS)



- Conservation practice implementation drop-down menu
- Improved baseflow separation
- Flood frequency analysis
- Integration of climate models and CE Qual-WQ

OKLAHOMA CONSERVATION COMMISSION

Illinois River HAWQS status and future



- Draft calibrated models developed, but not finalized.
  - Models aren't identical and that is OK
- Stakeholder meetings ongoing
- Next steps:
  - use models to support stakeholder prioritization of conservation programs
  - Update watershed plans for both states
- OK-HAWQS is improved for use in other watersheds through the Illinois River model.

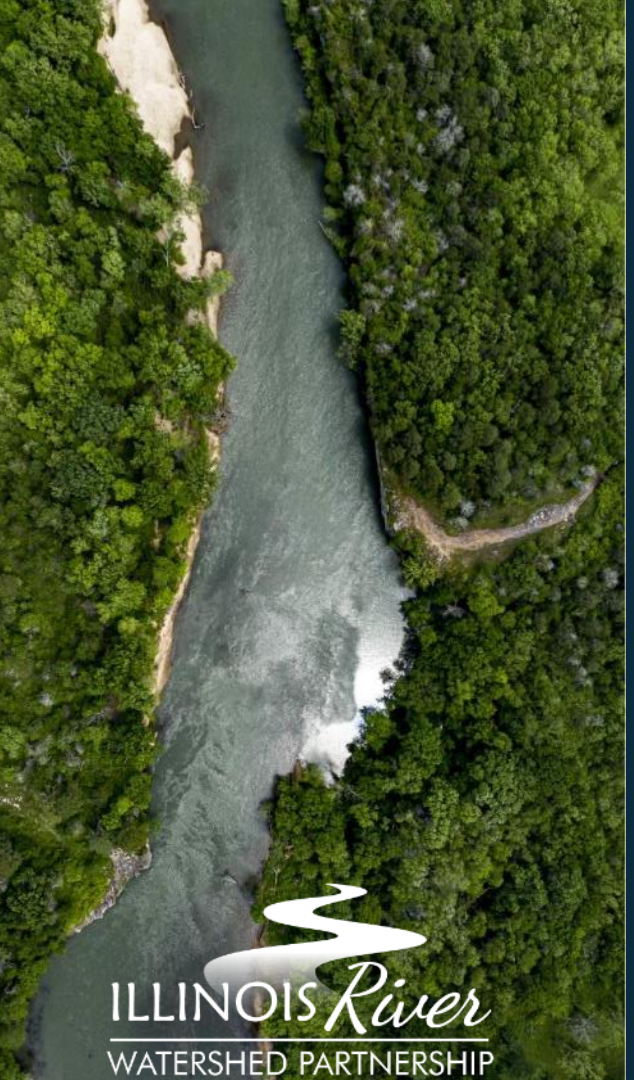
OKLAHOMA CONSERVATION COMMISSION

Questions

Contact Info:

shanon.phillips@conservation.ok.gov

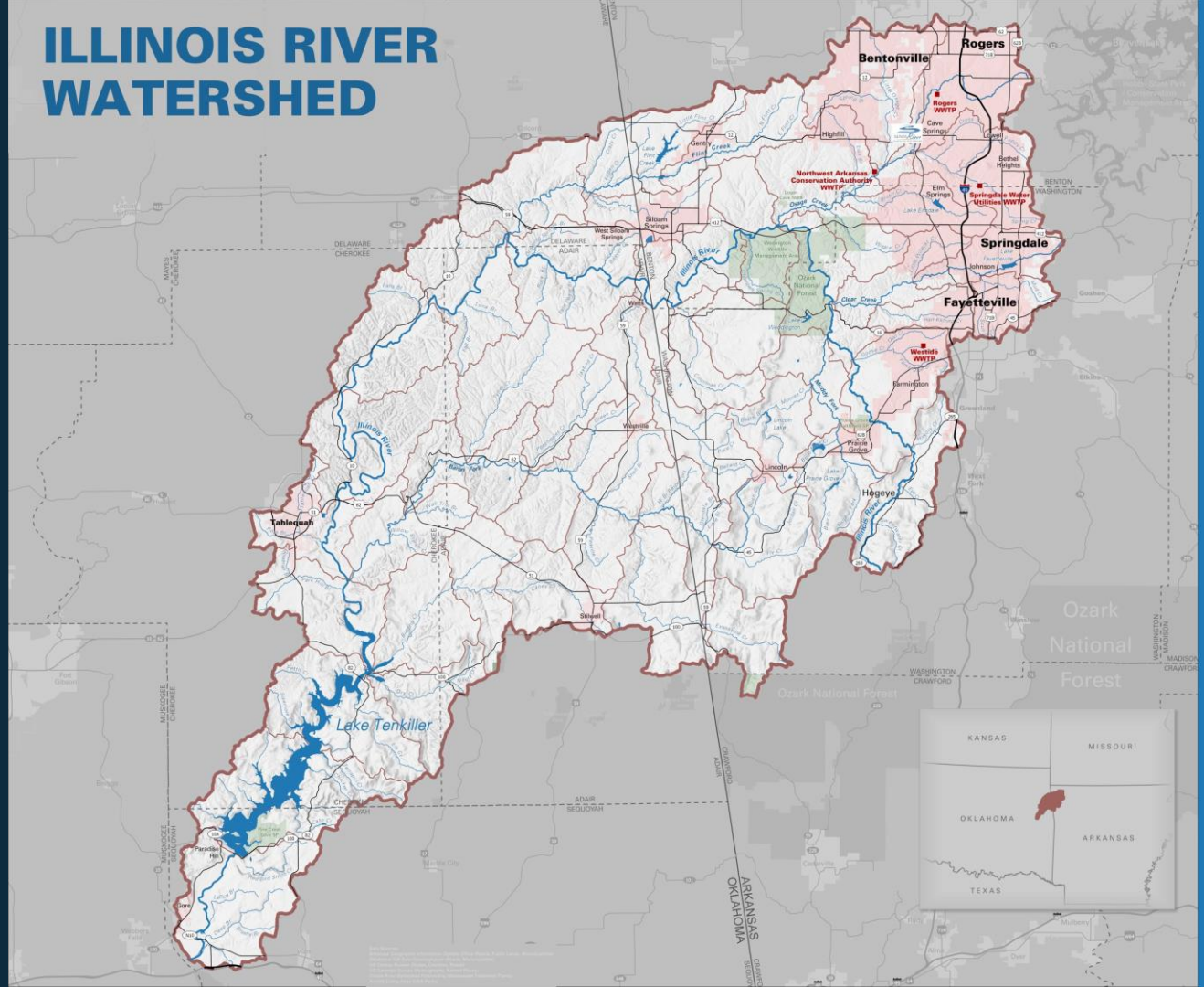
OKLAHOMA CONSERVATION COMMISSION



IMPLEMENTATION OF BMPs IN PRIORITY SUB-BASINS

Leif Kindberg
Executive Director

ILLINOIS RIVER WATERSHED



ILLINOIS River
WATERSHED PARTNERSHIP

- Illinois River Watershed Partnership
- **Wastewater Treatment Plant (WWTP)**
- Headwater Community
- Interstate
- US Highway
- State Highway
- STATE BOUNDARY
- COUNTY BOUNDARY
- **Urban Area**
- Public Land
- *Lake/Pond*
- ***HUC 8 River***
- ***HUC 10 Stream***
- *Minor Stream*
- Illinois River Watershed HUC 8 Boundary
- Illinois River Watershed HUC 12 Boundary

Bradley Jones | dogwoodgeo.com
March 19, 2019

Mission

IRWP works to improve the integrity of the Illinois River through public education, community outreach, and implementation of conservation and restoration practices throughout the watershed.

IRWP Programs

- Low Impact Development/Green Infrastructure
- Riparian Restoration and Landowner Services
- Septic Tank Replacement Program
- Public Education
- Recreation Stewardship
- Water Quality Monitoring

ILLINOIS River
WATERSHED PARTNERSHIP

Local Stakeholders

Consensus-based solutions that support our region

Business

- Tyson
- Simmons
- Arvest

Agriculture

- Local producers
- AR Farm Bureau
- OK Farm Bureau

Conservation

- AGFC
- ANRD
- Quantified Ventures

Construction

- Burns & McDonnell
- Crafton Tull

Technic, Res & Ed

- AR Water Resources Center (AWRC)
- NWAMN
- OK Conservation Commission

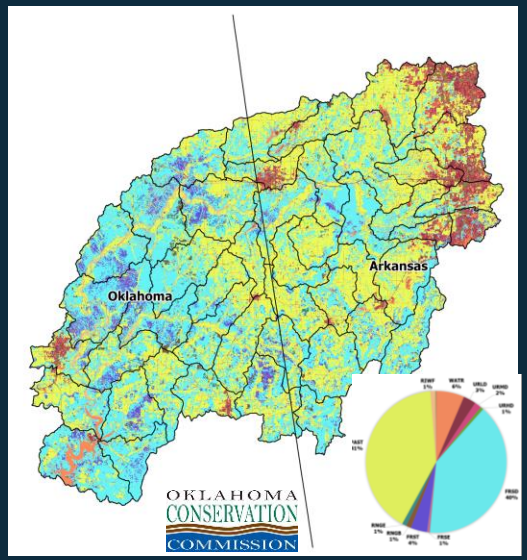
Government

- Springdale Water Utilities
- Cherokee Nation
- GRDA

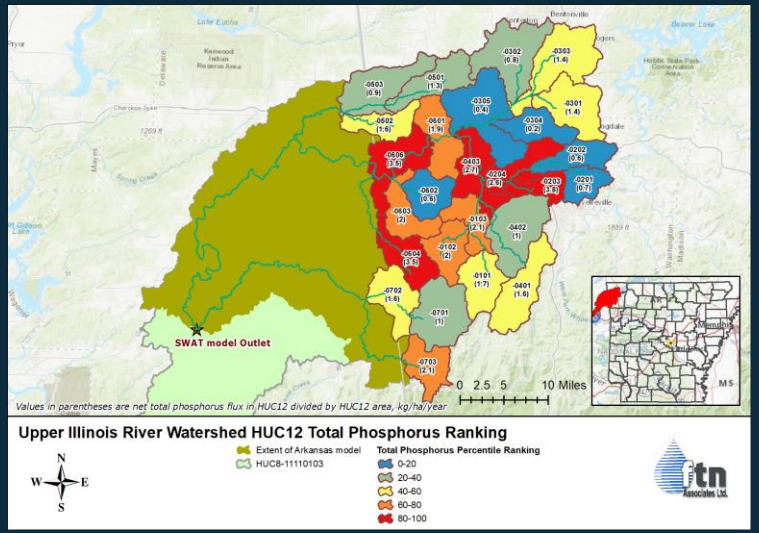
ILLINOIS River WATERSHED PARTNERSHIP

irwp.org

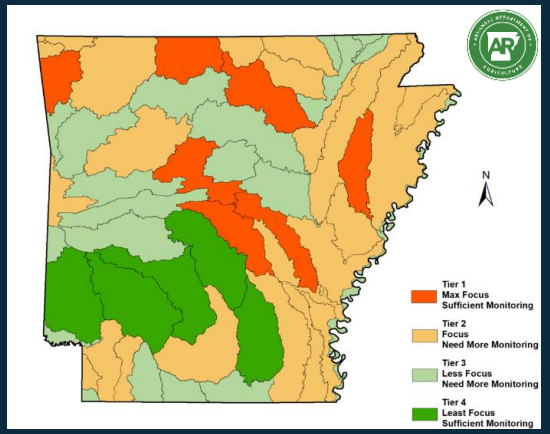
Implementation Guided by State and Local Priorities



Considerations of a rapidly growing region its needs



Focusing in on subwatersheds with highest priority BMPs



Tier 1: Increase or maintain downward nutrient trends

ILLINOIS River
WATERSHED PARTNERSHIP

Water Quality

- Many streams which do not meet designated use thresholds

OK Subwatershed (2022)	AU	Parameter
Flint Creek	OK121700060010_00	Oxygen, Dissolved
Illinois River	OK121700030280_00	Enterococcus, Escherichia coli, Phosphorus, Total
Pumpkin Hollow Creek	OK121700030090_00	Oxygen, Dissolved
Tyner Creek	OK121700050090_00	Oxygen, Dissolved
Barron Fork	OK121700050010_00	Phosphorus, Total
Caney Creek	OK121700040010_00	Macroinvertebrate Bio
Tenkiller Ferry Lake	OK121700020220_00 OK121700020220_00	Oxygen, Dissolved, Chlorophyll-A, Mercury, Phosphorus, Total
Walltrip Branch	OK121700050070_00	Macroinvertebrate Bio
Cedar Hollow Creek	OK121700030110_00	Macroinvertebrate Bio Fish Bioassessments
Tahlequah Creek (Town Branch)	OK121700030040_00 OK121700030020_00	Enterococcus, Escherichia coli
Stick Ross Creek	OK121700030030_00	Macroinvertebrate Bio
Park Hill Creek	OK121700020270_00	Macroinvertebrate Bio
Elk Creek	OK121700020180_00	Oxygen, Dissolved
Chicken Creek	OK121700020110_00	Fish Bioassessments
Deep Branch	OK121700010020_00	Oxygen, Dissolved

AR Subwatershed (2022) DRAFT	AU	Parameter
Little Osage Creek	AR_11110103_630 AR_11110103_933	Primary Contact E. coli
Moores Creek	AR_11110103_026	Primary Contact E. coli
Muddy Fork	AR_11110103_027	Primary Contact E. coli
Illinois River	AR_11110103_024 AR_11110103_028 AR_11110103_020 AR_11110103_018	Primary Contact E. coli; Turbidity Base/Base Flow
Baron Fork	AR_11110103_813	Critical Season DO
Clear Creek	AR_11110103_029	Primary/Secondary Contact E. coli
Unnamed Tributary of Brush Creek	AR_11110103_733	Primary Season DO
Lake Fayetteville	AR_11110103_4080	pH - Short Term Continuous

ILLINOIS River
WATERSHED PARTNERSHIP

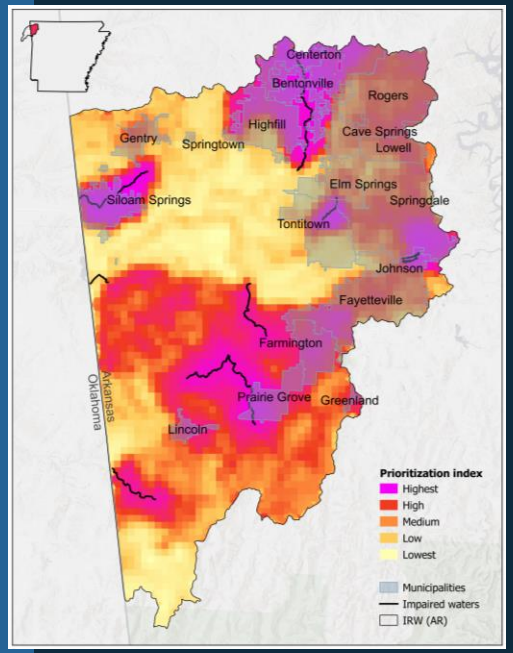
Sources of Impairments

- Streambank erosion
- Construction
- Land application of nutrients
- Wastewater treatment
- Septic systems
- Livestock management practices
- Landscaping and turf management

ILLINOIS River
WATERSHED PARTNERSHIP

Green Infrastructure

- EPA 319(h) funded
- To reduce nonpoint source sediment and nutrient loads through green infrastructure best management practices
- 30+ projects over three years
- Develop educational resources, hold field tours, and present program results and opportunities to municipal Planning Commissions, Councils, and staff



GREEN INFRASTRUCTURE PROGRAM TO IMPROVE WATER QUALITY

The Illinois River watershed is considered a nutrient surplus area and is a high priority watershed for remediation and conservation. Through this program, the Illinois River Watershed Partnership (IRWP) will use green infrastructure to reduce runoff, sediment, and nutrient loads into the waterways. IRWP will work with municipalities, companies, schools, non-profit organizations, HOAs, and individuals to place these projects at a 50% cost-share in high visibility locations throughout the watershed to serve as demonstrations of stormwater quality solutions. Starting in February 2023, IRWP will accept applications for a variety of GI projects including rain gardens, bioswales, pervious pavement, green roofs, and detention pond retrofits. Please visit the link below to apply.

A **detention pond retrofit** helps improve water quality and recreation, reduce water quantity, maintenance costs, and safety risks, and maintain regulatory compliance.

Rain gardens are designed to capture water and nutrients. The garden is filled with deep-rooting native plants to facilitate infiltration into the soil and phytoremediation.

Bioswales are designed to slow down water along a path using plants and rocks. This allows pollutants to settle and infiltrate through the soil where they can be captured and broken down.

Permeable pavements minimize runoff by allowing water to infiltrate into the engineered underlayer and soil. **Ribbon driveways** are a simple way to decrease the impervious cover and runoff caused by paved driveways.

Vegetated roofs consist of waterproof, drainage, and vegetated layers that slow down and filter rainwater before it reaches the stormwater system. Green roofs can also reduce heat islands, provide insulation, and extend roof life.

Green streets utilize a variety of GI practices like curb cuts and vegetation to capture and filter rainwater before it reaches the stormwater inlet. In addition to improving water quality, green streets enhance community health.

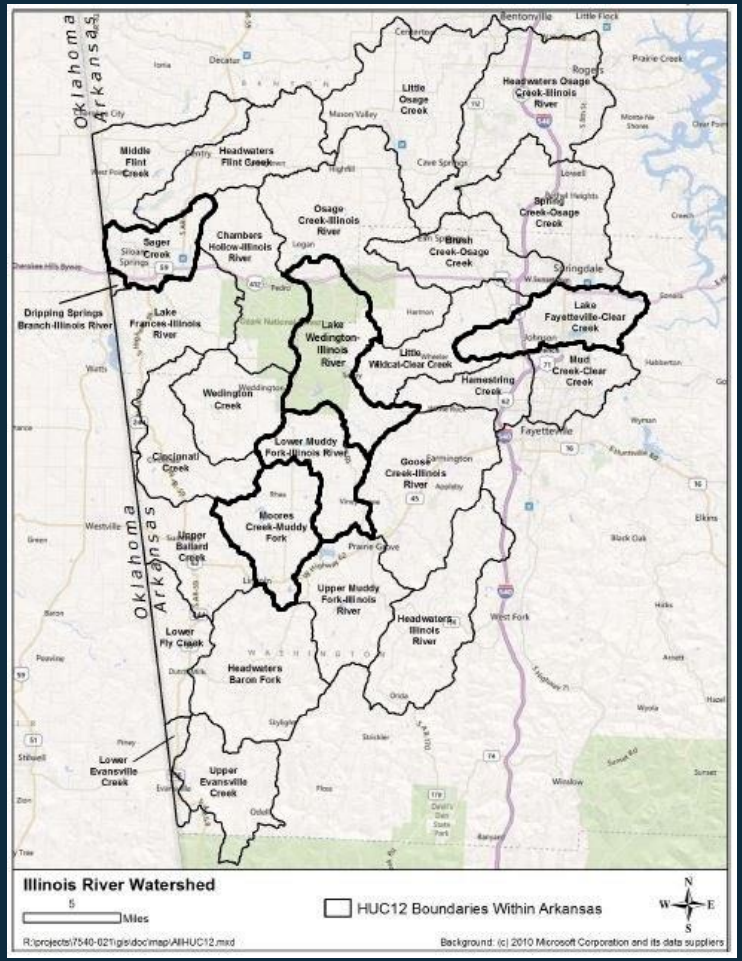
For more information on applying, please contact Holly Wren at (501) 773-9448 or hollyw@irwp.org. To access the application, please visit **irwp.org/giprogram**.

Funding for the Illinois River Watershed Partnership Green Infrastructure Program provided by the USEPA through the ADA-NRD Nonpoint Source Management Program.

Riparian Restoration Program

Focused on proven conservation BMP's

- Constructed wetlands (Practice 656)
- Critical area planting (Practice 342)
- Field borders (Practice 386)
- Filter strips (Practice 393)
- Forest stand improvement (Practice 666)
- Heavy use area protection (Practice 561)
- Prescribed grazing (Practice 528)
- Riparian forest buffer (Practice 391)
- And more…



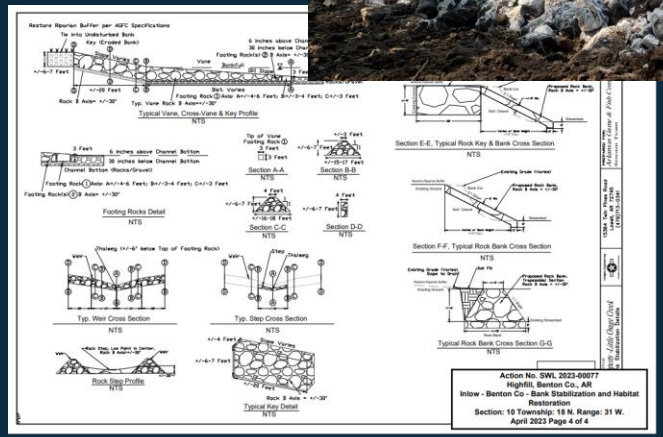
ARKANSAS DEPARTMENT OF AGRICULTURE

WALTON FAMILY FOUNDATION

Little Osage Creek Restoration

Before Construction

During Construction



Streambank stabilization and establishment of 60-foot riparian buffer along 4,000 linear feet with cattle exclusion

ARKANSAS Game and Fish Commission

U.S. Fish & Wildlife Service Partners for Fish & Wildlife

WALTON FAMILY FOUNDATION

ARKANSAS DEPARTMENT OF AGRICULTURE

ILLINOIS River WATERSHED PARTNERSHIP

10,000 sq foot bioretention to treat stormwater

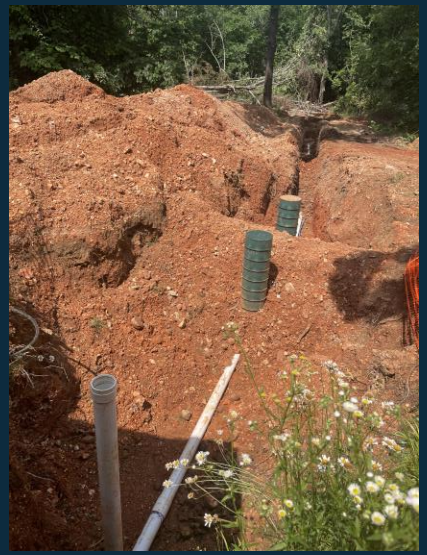
Riparian Restoration Program Results

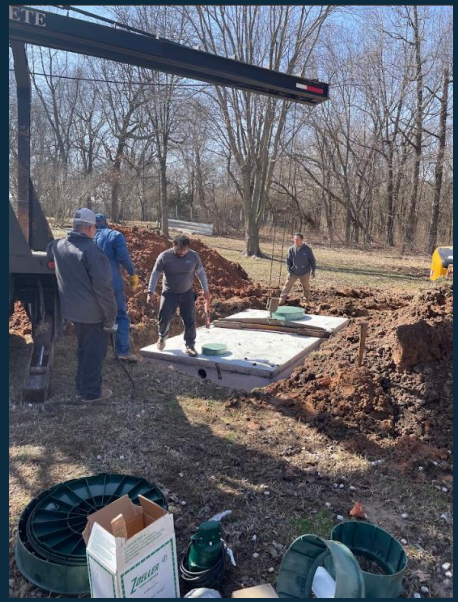
- 55 conservation plans prepared
- 21.49 miles (102% of goal) of streambank restored/protected
- 1,422 acres (107% of goal) serviced by alternative watering facilities
- 101,729 linear feet (135% of goal) of fencing installed for rotation grazing

ILLINOIS River
WATERSHED PARTNERSHIP

Septic Tank Remediation Program

- Replace or repair failing septic systems and promote maintenance
- Up to 90% grant or zero-interest loan
- 70 installed since 2021; $871,575 invested in Benton and Washington Counties



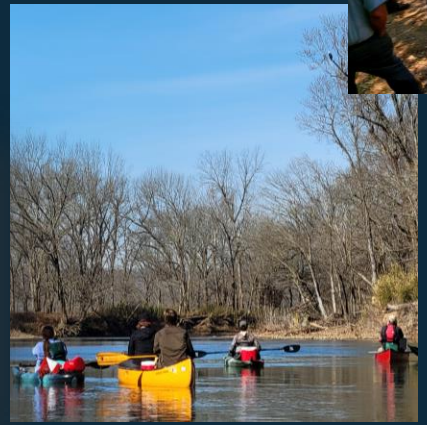


ARKANSAS DEPARTMENT OF AGRICULTURE

ILLINOIS River WATERSHED PARTNERSHIP

Other Program Results

- **4,085 students** from **26** different schools in ‘23
- **6,362+ trees planted** throughout the watershed
- Ecological monitoring at **11+ sites annually**
- **4,260 pounds of trash removed** from the Illinois River and its tributaries
- **217 volunteers** involved in water quality projects



IRWP Sponsors & Grantors

Thank You to Our Dedicated Partners in Illinois River Watershed Management

LEGACY and WATERSHED

RIVER and TRIBUTARY

STREAM, CREEK, and SPRING

THANK YOU

director@irwp.org

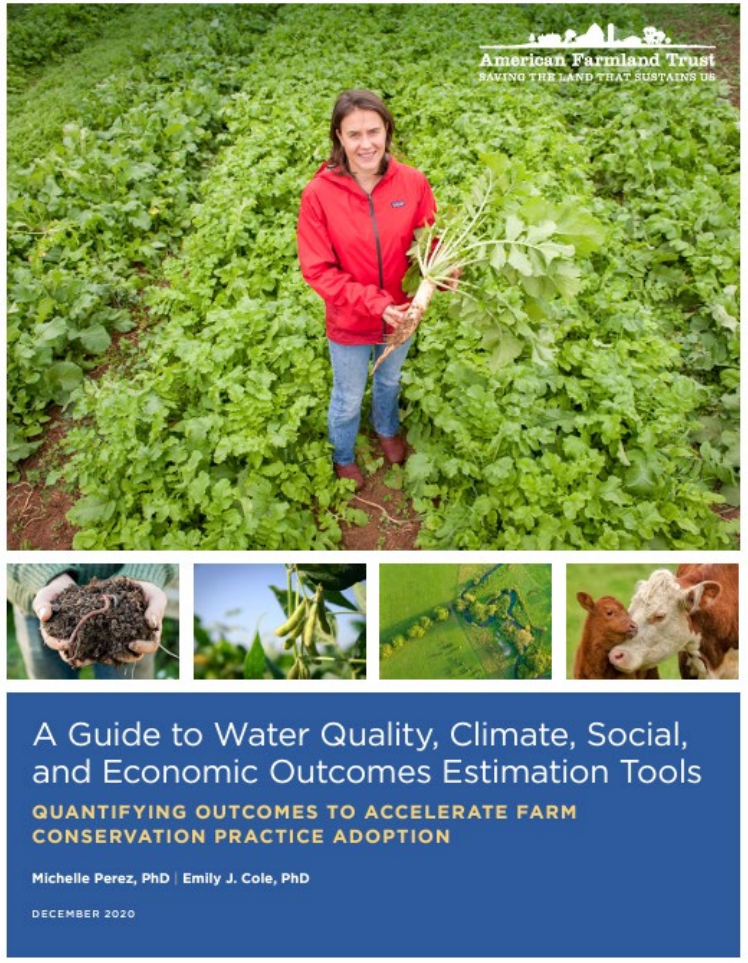
irwp.org

Leif Kindberg
Executive Director
479-422-5676

ILLINOIS River
WATERSHED PARTNERSHIP

Next steps in our outcomes estimation journey

- ❑ Join April 3 for the Critical Source Area Identification and Management webinar
- ❑ Fill out the 8-question (2-min) online evaluation survey
- ❑ Schedule a free “coaching” session with us
  - ❑ **Email atappross@farmland.org, RE: Coaching Request**
- ❑ Order a free print copy of the OET Guide
  - ❑ Keyword: “AFT outcomes tools”



American Farmland Trust