



# ARKANSAS DEPARTMENT OF HEALTH

## Tools for Leveraging Source Water Protection Funding

Darcia Routh, P.G.  
Source Water Protection  
Engineering Section

Middle Fork Little Red, Clinton's Watershed; photo by R. Hutto



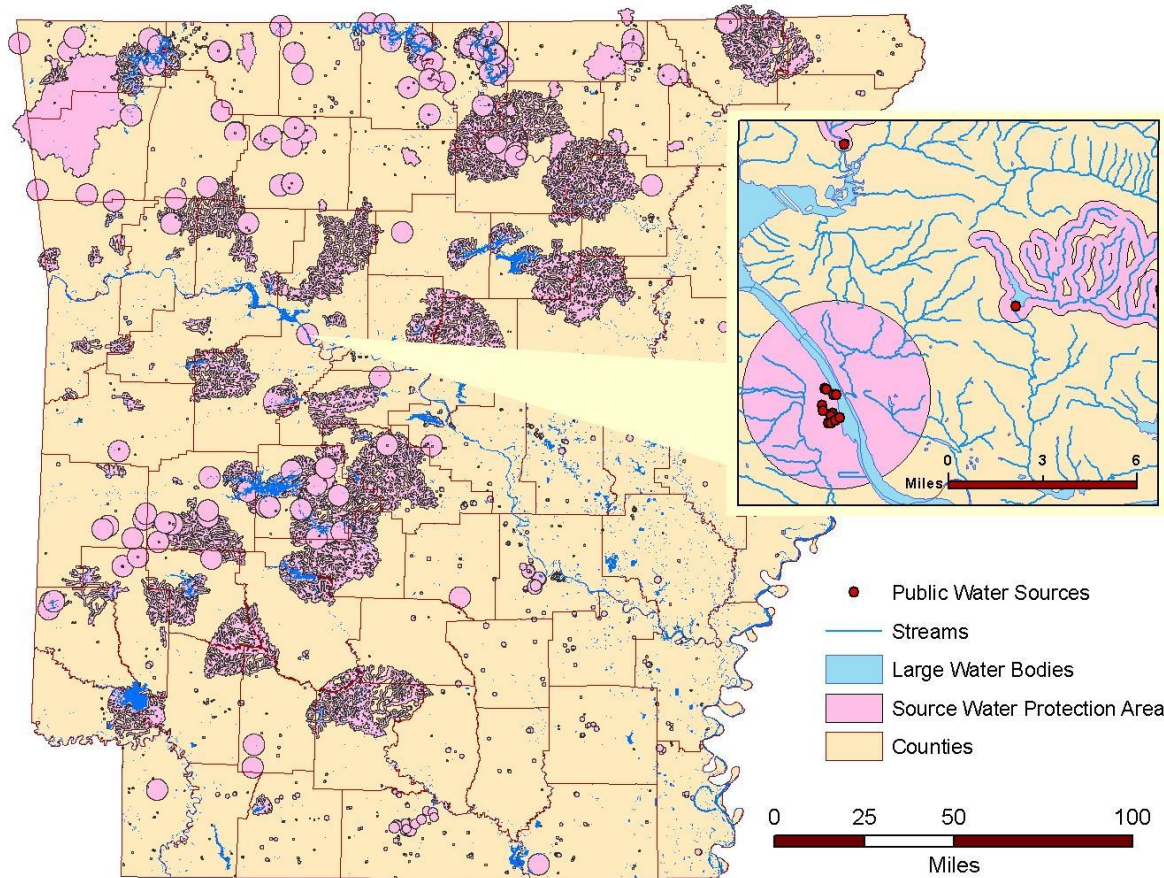
# Public Water at a Glance

## Characteristics of Arkansas's Water Systems

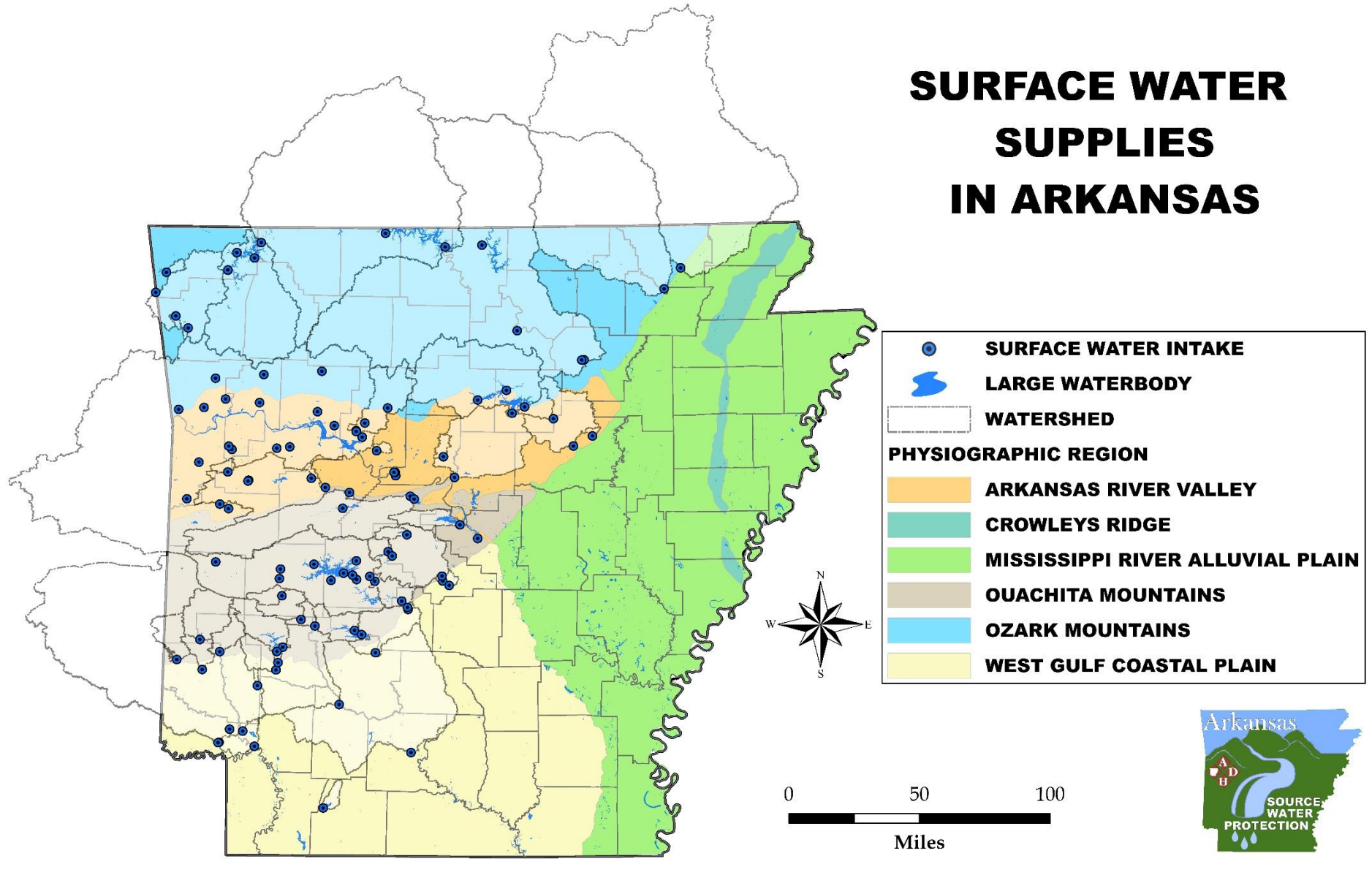
<b><u>Population of Arkansas (2018 U. S. Census Bureau Estimate)</u></b>	<b>3,013,825</b>
Population served by public water systems	2,929,458
Population served by surface water systems	1,905,997
Population served by ground water systems	852,239
Population served by ground & surface systems	171,222
% population served by community public water systems	97.2%
% population served by individual private wells or other source	2.8%
<b><u>Total number of public water systems active during 2018</u></b>	<b>1071</b>
Number of community public water systems	690
Number of transient non-community public water systems	346
Number of non-transient non-community public water systems	35
Number of systems using surface water	439
Number of systems using ground water	596
Number of systems using ground & surface	36
Total average daily water used by public water systems (estimate MGD)	561

# Public Water at a Glance

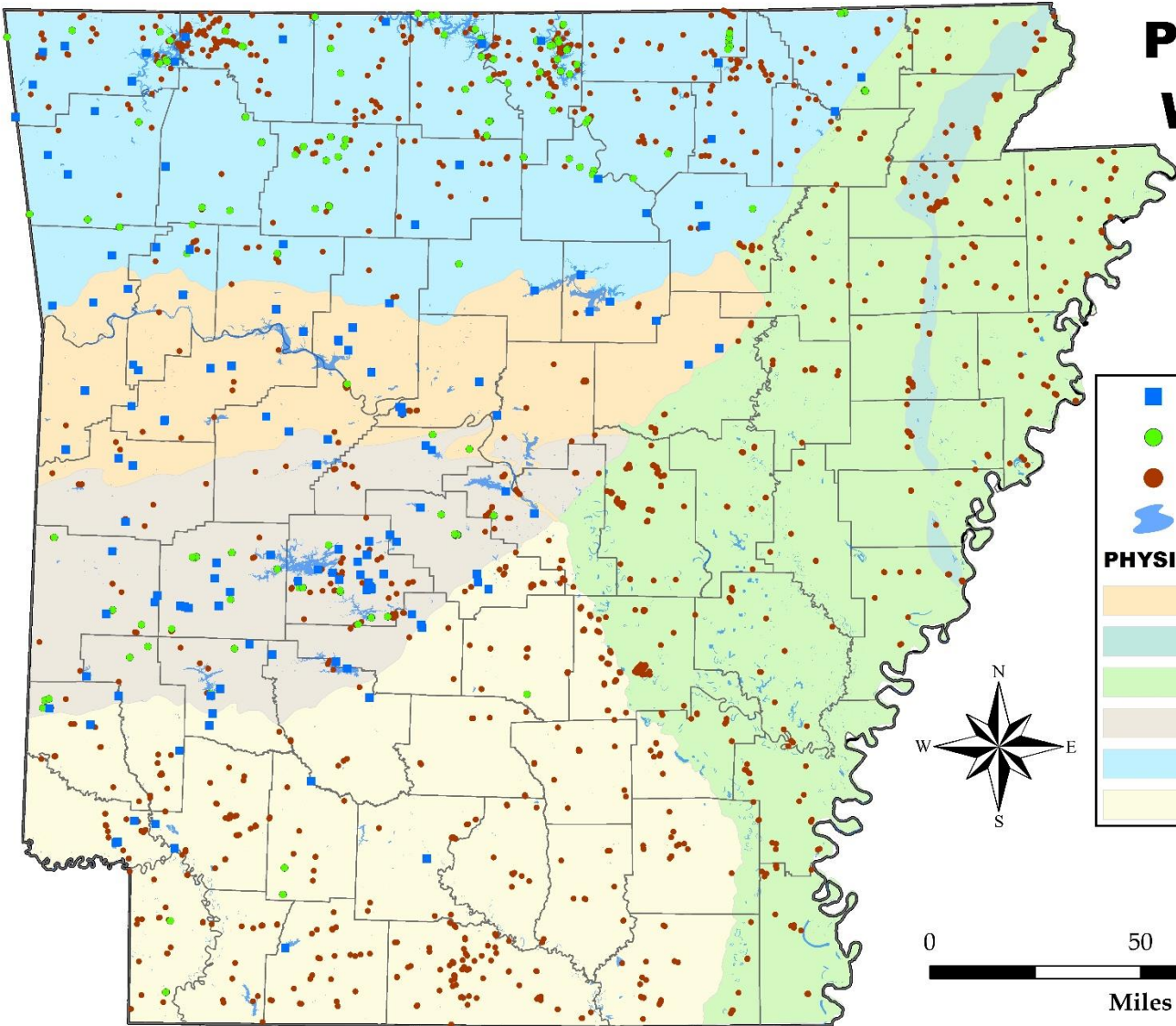
## SOURCES & SOURCE WATER PROTECTION AREAS



# SURFACE WATER SUPPLIES IN ARKANSAS



# PUBLIC DRINKING WATER SUPPLIES IN ARKANSAS



- SURFACE WATER INTAKE
- WELL - SURFACE INFLUENCED
- WELL
- LARGE WATERBODY

**PHYSIOGRAPHIC REGION**

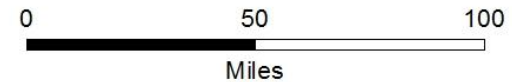
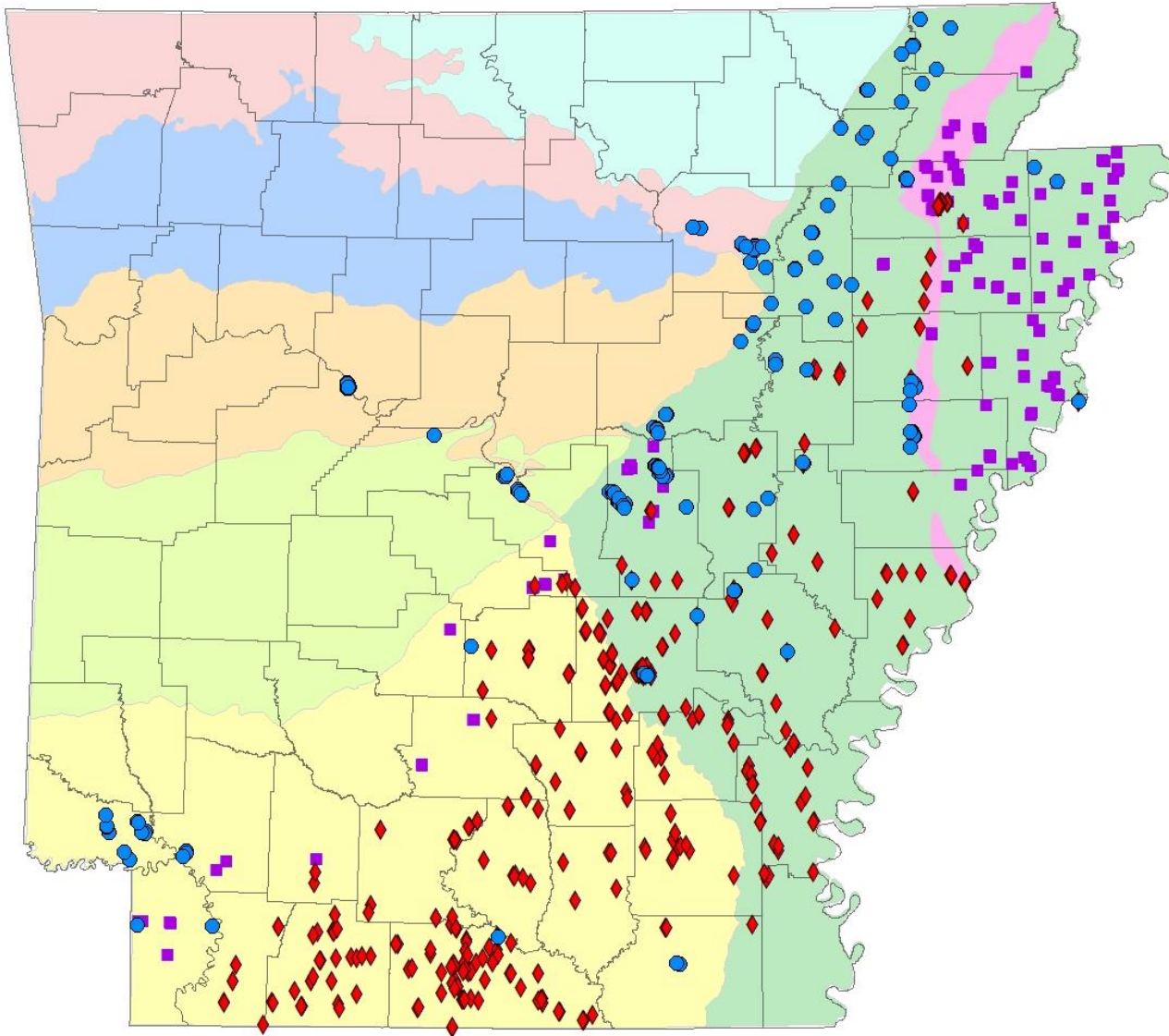
- ARKANSAS RIVER VALLEY
- MISSISSIPPI RIVER ALLUVIAL PLAIN
- OUCHITA MOUNTAINS
- OZARK MOUNTAINS
- WEST GULF COASTAL PLAIN



# Public Water Supply Wells

## MERAS Area Overview Wells

- Wells - Quaternary System
- ◆ Wells - Memphis/Sparta Sands
- Wells - Wilcox Group
- ⊕ County
- Arkansas Valley
- Boston Mountains
- Crowleys Ridge
- Mississippi River Alluvial Plain
- Ouachita Mountains
- Salem Plateau
- Springfield Plateau
- West Gulf Coastal Plain

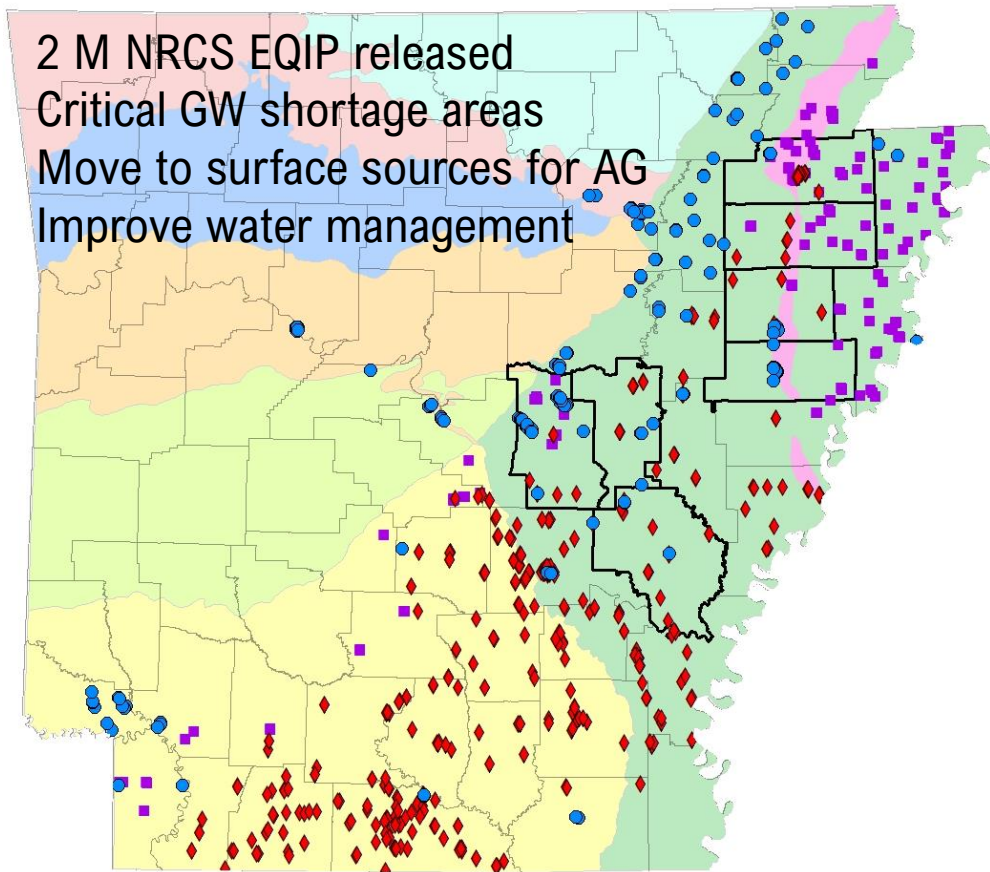


# The Opportunity



# NRCS Groundwater Funding

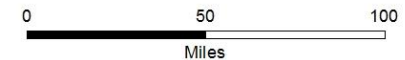
2 M NRCS EQIP released  
Critical GW shortage areas  
Move to surface sources for AG  
Improve water management



## Public Water Supply Wells

### MERAS Area Overview Wells

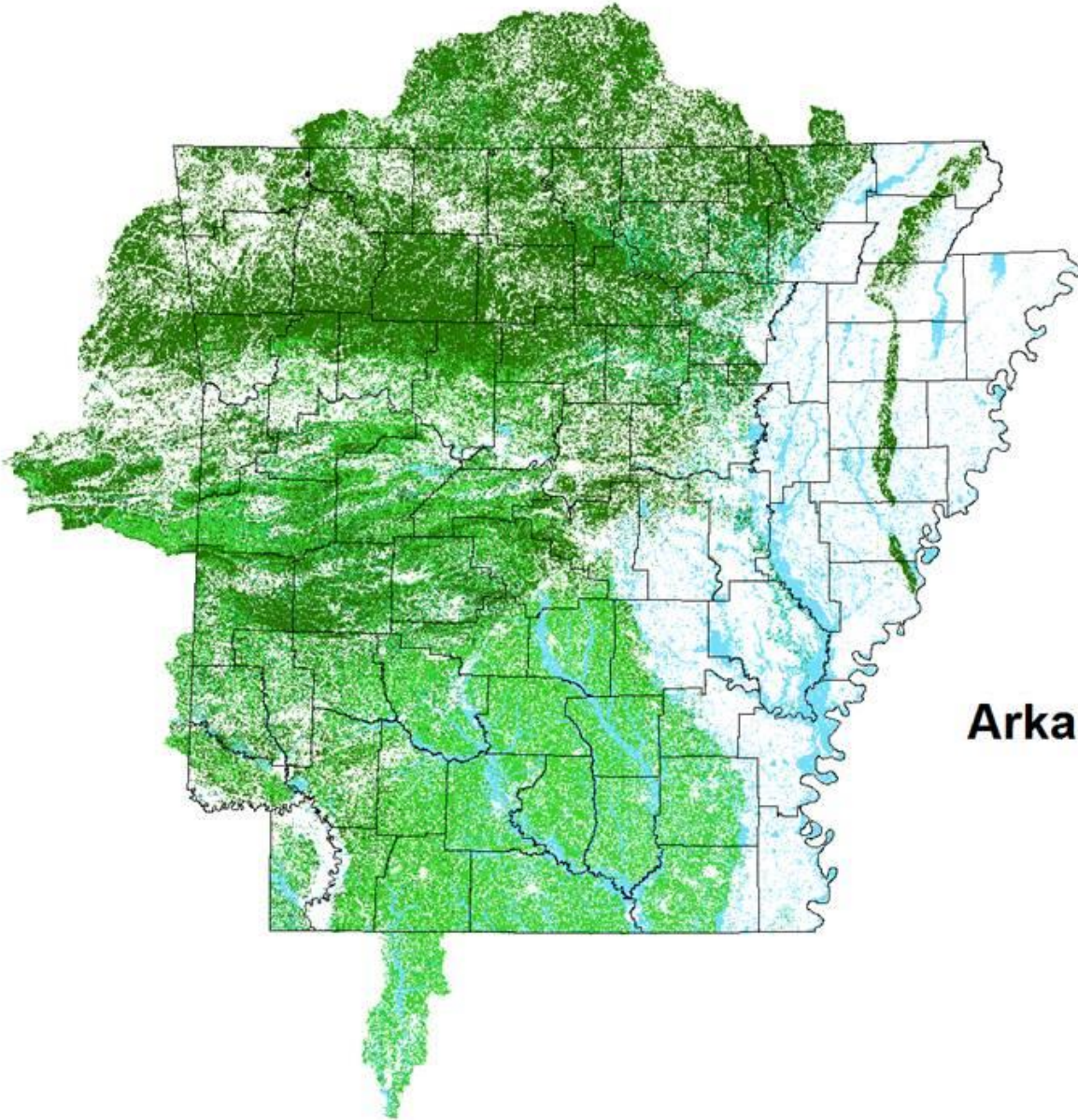
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**ARKANSAS  
FORESTS &  
DRINKING WATER  
COLLABORATIVE**

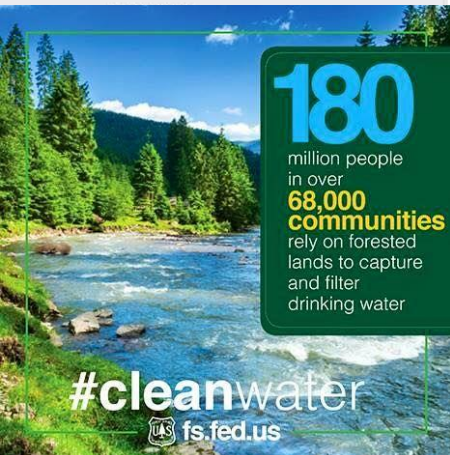


### Arkansas Forested Land Cover

-  Deciduous Forest
-  Evergreen Forest
-  Mixed Forest
-  Woody Wetlands

Events

- Events
- Calendar
- Arkansas' 3rd Forum on Forests and Drinking Water
- Birthdays
- Discover



3rd Statewide Forum

# FOCUS ON ACTION

**ARKANSAS FORESTS & DRINKING WATER COLLABORATIVE**

NOV 4  
**Arkansas' 3rd Forum on Forests and Drinking Water**  
 Public · Hosted by Arkansas Forests and Drinking Water Collaboration

✓ Going ▾ ➔ Share ▾ ⋮

🕒 Nov 4 at 1 PM – Nov 5 at 4 PM

📍 The Lodge At Mount Magazine  
 577 Lodge Drive, Paris, Arkansas 72855 Show Map

🎫 Tickets Find Tickets  
 events.r20.constantcontact.com

About Discussion

6 Going · 31 Interested

Forest management activities can potentially cause water quality problems. The following are a few potential concerns for water quality.

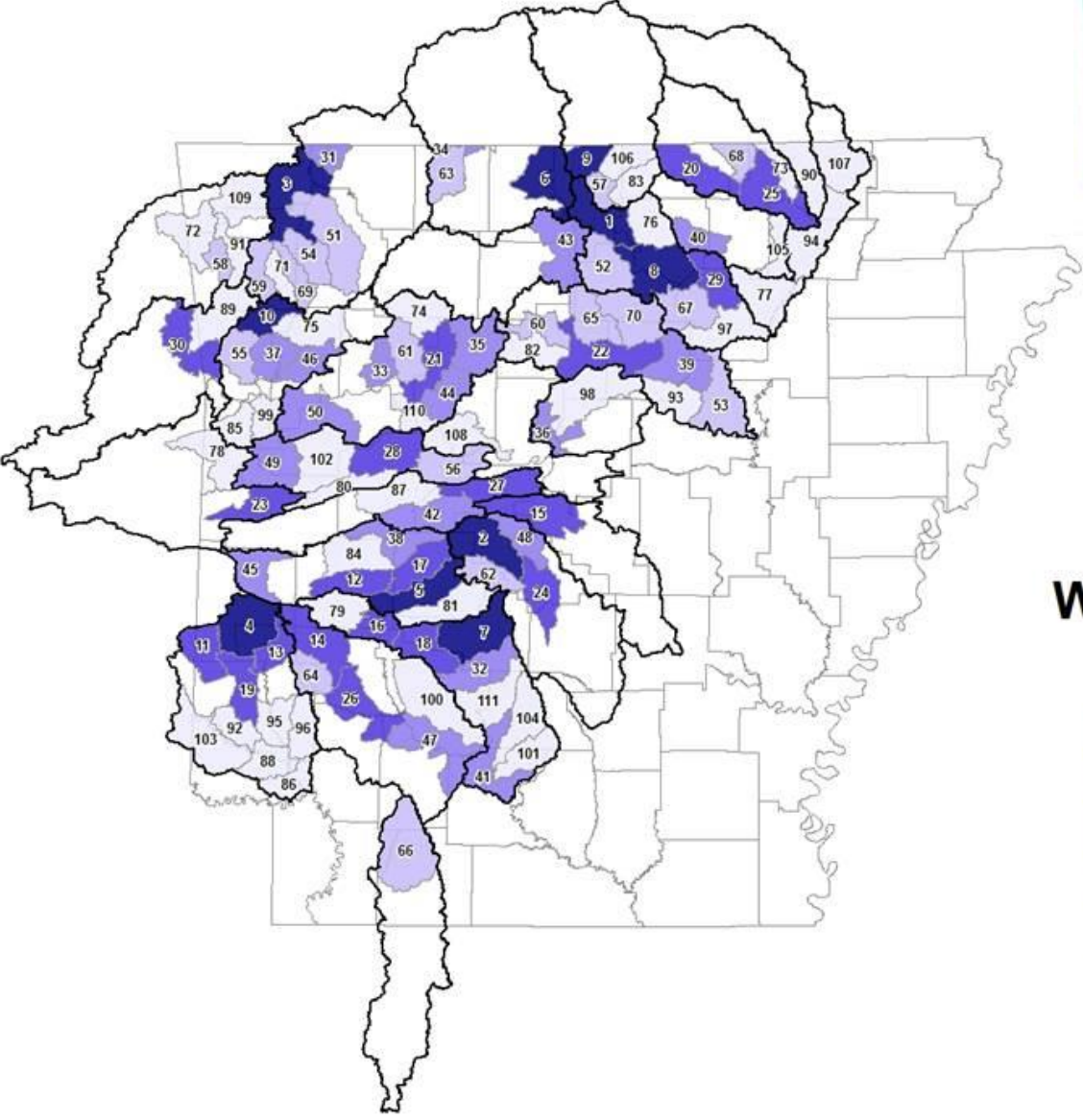
Activity	Potential Impacts on Water Quality
	<ul style="list-style-type: none"> <li>Sediment is the primary pollutant arising from road construction, log landings, and skid trails. Design roads, landing, and skid trails to limit sediment getting into streams.</li> </ul>
	<ul style="list-style-type: none"> <li>Debris from timber harvesting such as tree tops and limbs should be kept out of the stream to minimize bank erosion and maintain stream flow.</li> </ul>
	<ul style="list-style-type: none"> <li>Nutrients and chemicals from fertilizers, improperly applied herbicides and pesticides, and from oils and fuels used in machinery can also wash into streams. Excessive nutrients can reduce oxygen levels and certain chemicals can be toxic to aquatic organisms. BMPs can reduce the potential of them getting into streams, ponds, and lakes.</li> </ul>
	<ul style="list-style-type: none"> <li>Temperature levels with a stream or water body can also increase as a result of clearing timber along stream banks. Raised water temperatures can reduce oxygen levels and contribute to drying up ephemeral streams and water holes.</li> </ul>

Interested - Going

English (US) · Español · Português (Brasil) · Français (France) · Deutsch +



# ARKANSAS FORESTS & DRINKING WATER COLLABORATIVE



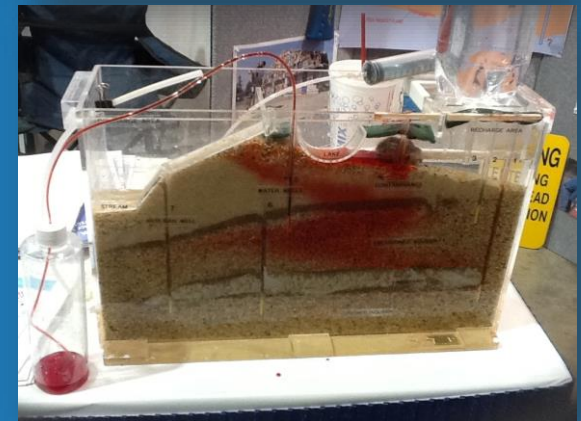
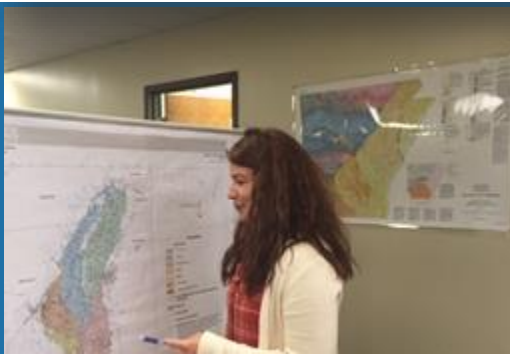
## Watershed Prioritization by Rank

-  1 - 10 (Highest Priority)
-  11 - 30
-  31 - 50
-  51 - 70
-  71 - 111 (Lowest Priority)



# Collaboration @ADH

- Tireless (usually) effort to connect with stakeholders:
- Notebook!





## THE SOURCE WATER COLLABORATIVE CAN HELP YOU.



Assess & Protect  
Drinking Water  
Sources



Connect With Others



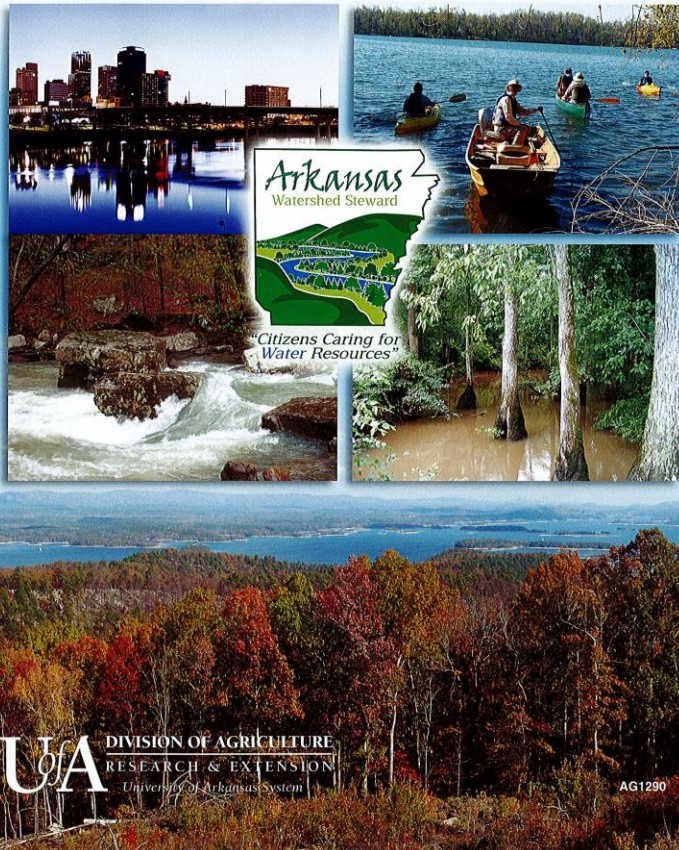
Respond To An  
Emergency



Learn About Source  
Water Collaborative

# Arkansas Watershed Stewards

## Arkansas Watershed Steward Handbook



## Arkansas Watershed Steward Partners



WATERSHED CONSERVATION  
RESOURCE CENTER

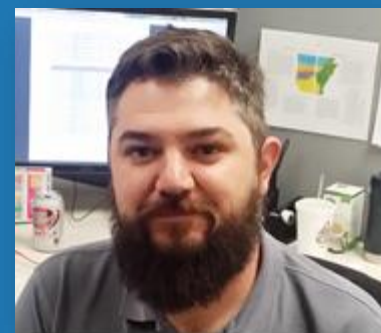


Arkansas Forest Resources Center  
A University of Arkansas Center of Excellence





# SWPP GIS Staff



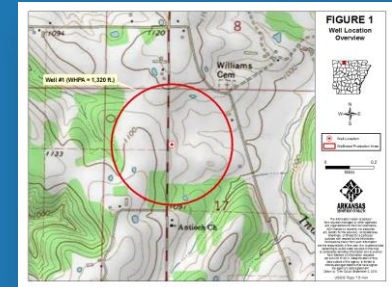
Ben Gilley, Tyler Couch, & Richard Norwood  
Source Water Protection Program  
Do/did the heavy lifting for watershed protection  
& SWAP GIS Model

Allie Cumnock & Evelyn Kort—camera-shy geologists

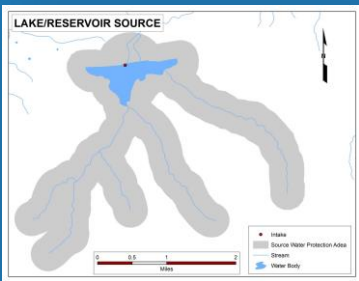
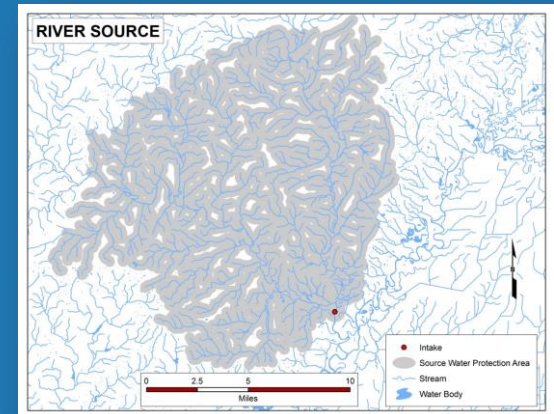
# SWAP Reports

Delineation for each surface and groundwater source in AR

USGS developed SWAP Esri toolbox

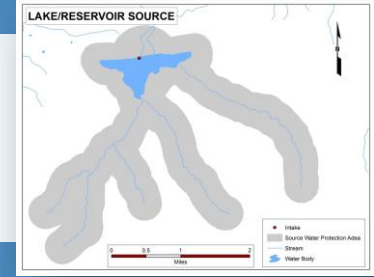
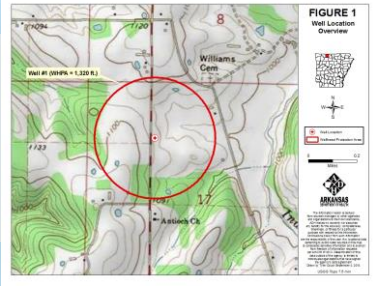


- SWAP.pyt
  - A) Update tables and relationships in SWAP.gdb from ArkPWS
  - B) Add new source
  - C) Move source
  - D) Delete source
  - E) Make Radial Buffer
  - F) Select Streams or Lakes by Radius
  - G) Make Streams and Lakes Buffer
  - H) Compile and Append Assessment Area
  - I) Flag Unused Data Fields
  - J) Update Assessment Area from GIS Data
  - K) Update Assessment Area from ArkPWS table within SWAP.gdb
  - L) Calculate Susceptibility
  - M) Assign Susceptibility Class
  - N) Run Vulnerability and Generate Report
  - Z) Clean up





# SWAP Reports



## Vulnerability Assessment: Susceptibility analysis combined with PSOC inventory

### SOURCE WATER ASSESSMENT

Beaver Water District - PWS ID - 038



Completed by  
Arkansas Department of Health  
Engineering Section  
February 13, 2015

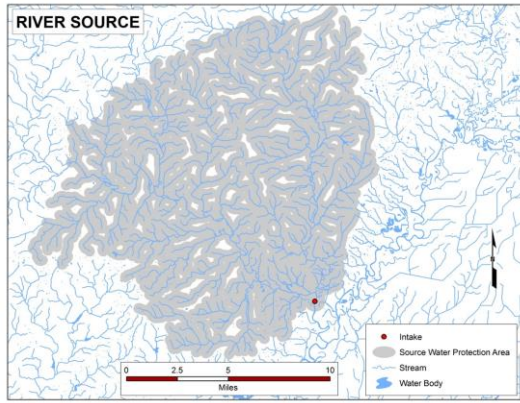


Table 1: Susceptibility Analysis:

Beaver Water District PWS ID - 038

PWS Source	High	Medium	Low
Beaver Lake - 038101			X
Beaver Lake - 038201			X

Table 3: Vulnerability Assessment:

Beaver Water District - Beaver Lake - 038201

PSOC Health Risk Category <sup>1</sup>	Beaver Lake					Total
	0-1mi	1-2mi	2-3mi	3-4mi	4-5mi	
1				2		2
2			6	4		10
3		3	3	2	2	10
4		2	2	2	2	8
5		12	43	16	9	80
6		4	46	8	6	64
7			2			2
8			4			4
9						
10		2	6	2	8	18
Total	0	23	112	36	27	198



# What Next?

- ADH & NRCS cooperate on source water protection plan documentation
- 3<sup>rd</sup> AR Forestry & Drinking Water Forum November 4-5, 2019
- ADH issues all remaining updated SWAP Reports for GW PWS
- Everybody enjoys AR's fantastic water resources





# Questions?

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Photo by R. Hutto