



# Missouri Water Use: A People-Centered Science

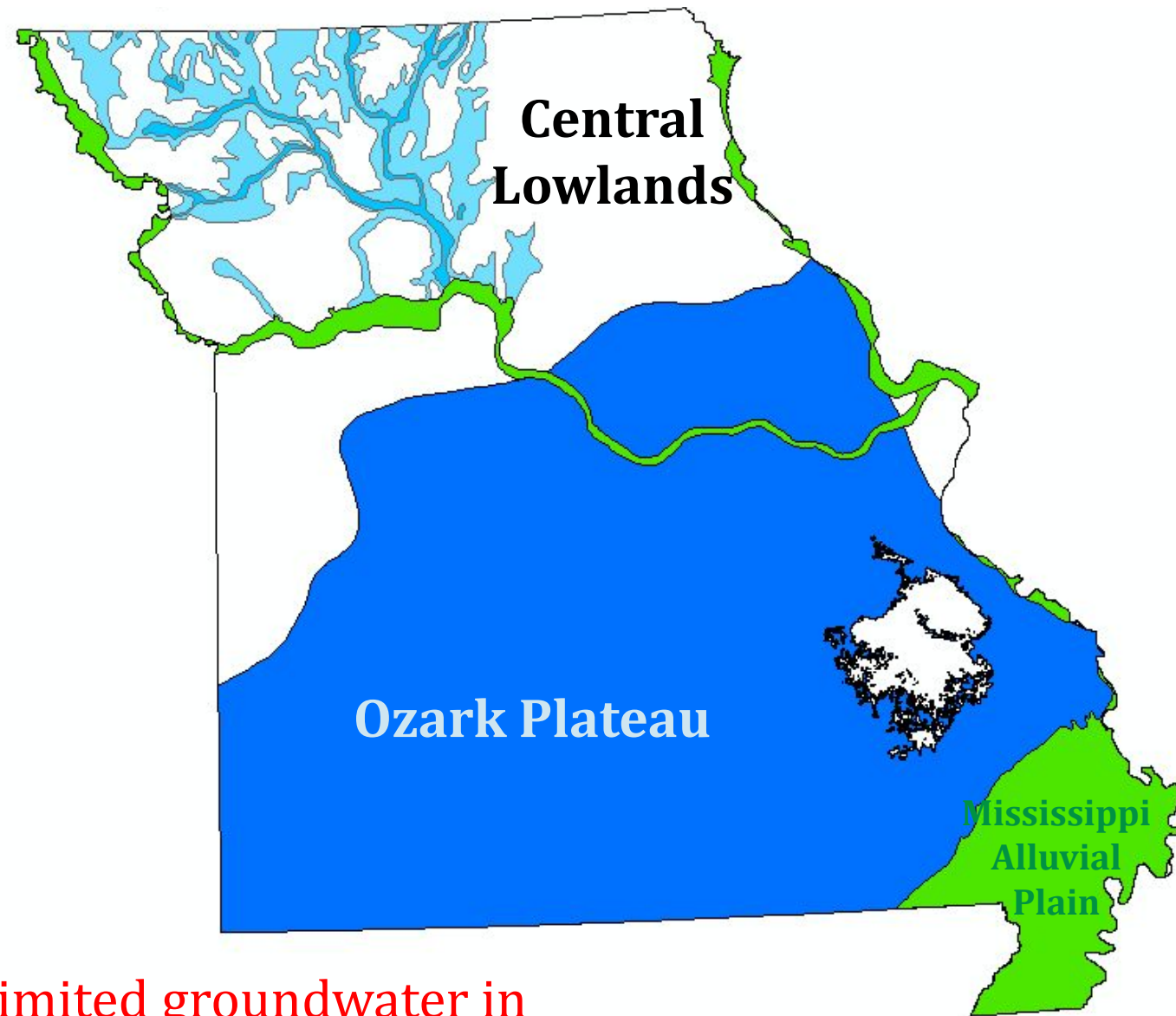
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# Missouri's Groundwater

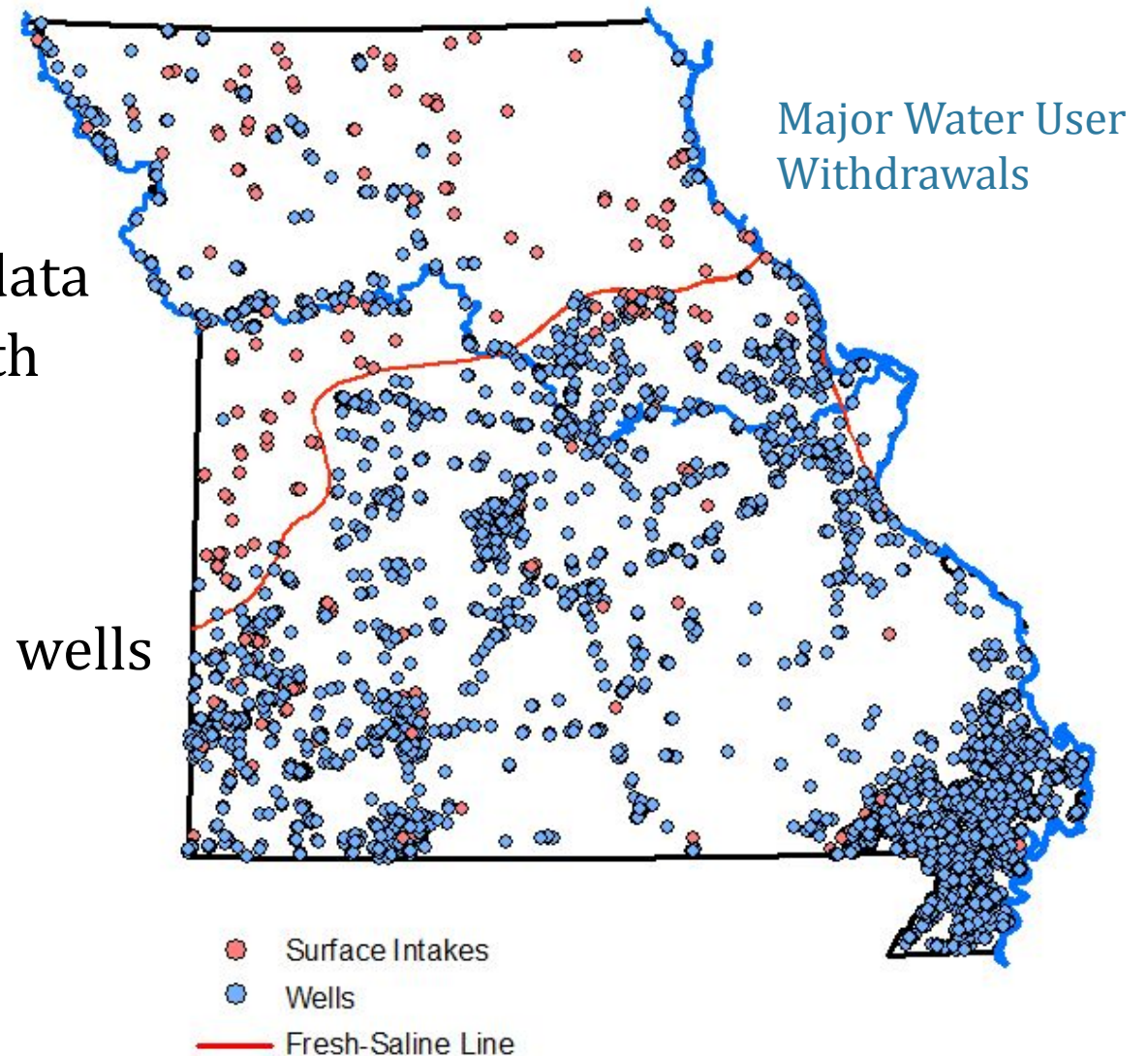
- Ozark Plateau (South and Central)
  - Forested, exposed bedrock
  - Ozark Plateaus aquifer system
- Mississippi Alluvial Plain (Southeast)
  - Swamps - drained to become major agricultural region
  - Southeast Lowland alluvial aquifer
- Central Lowlands (North and West)
  - Rolling plains, glaciated region
  - Pre-glacial Channels Aquifer System



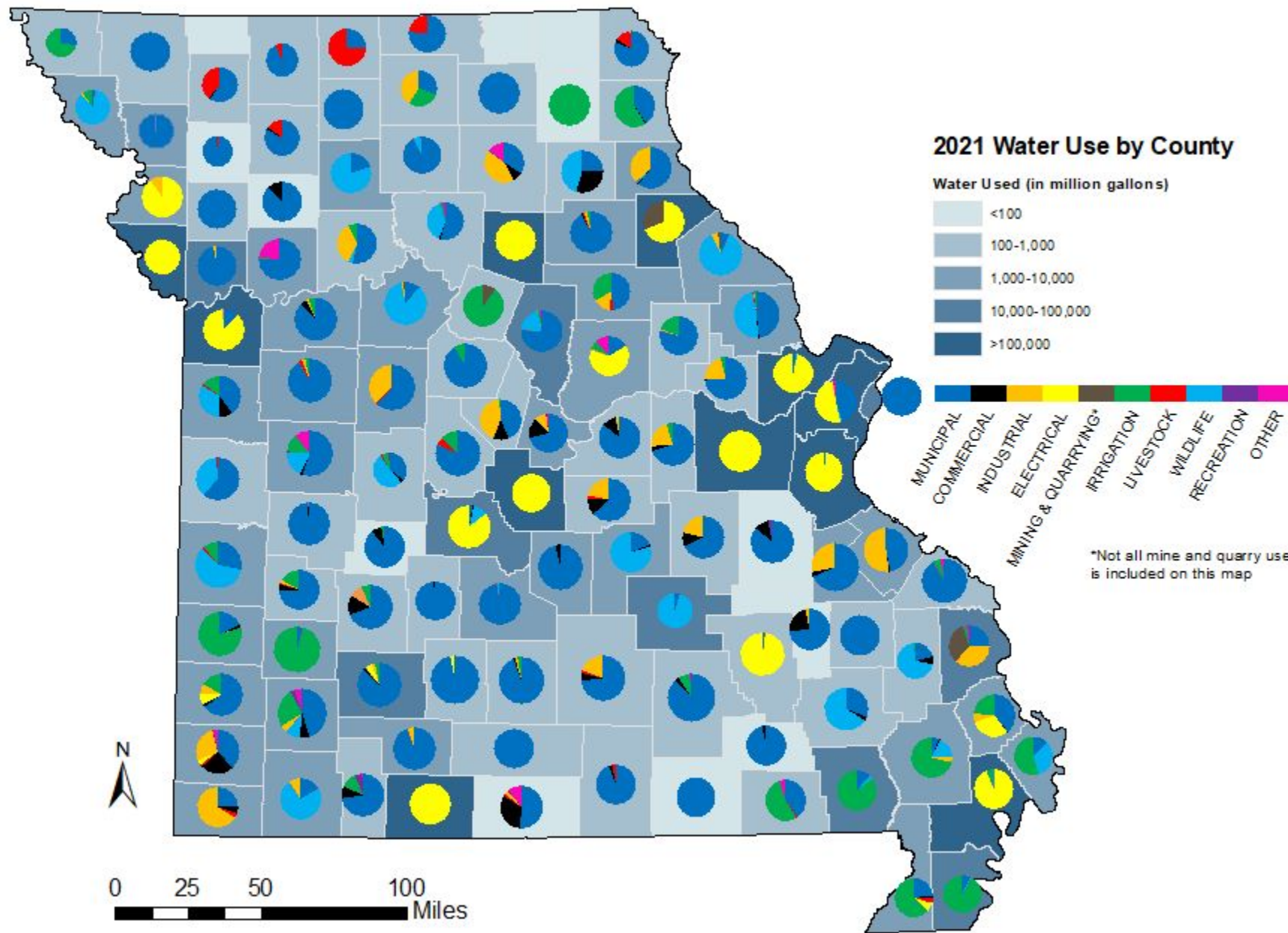
Abundant groundwater in the south, limited groundwater in the north

# Water Use Breakdown

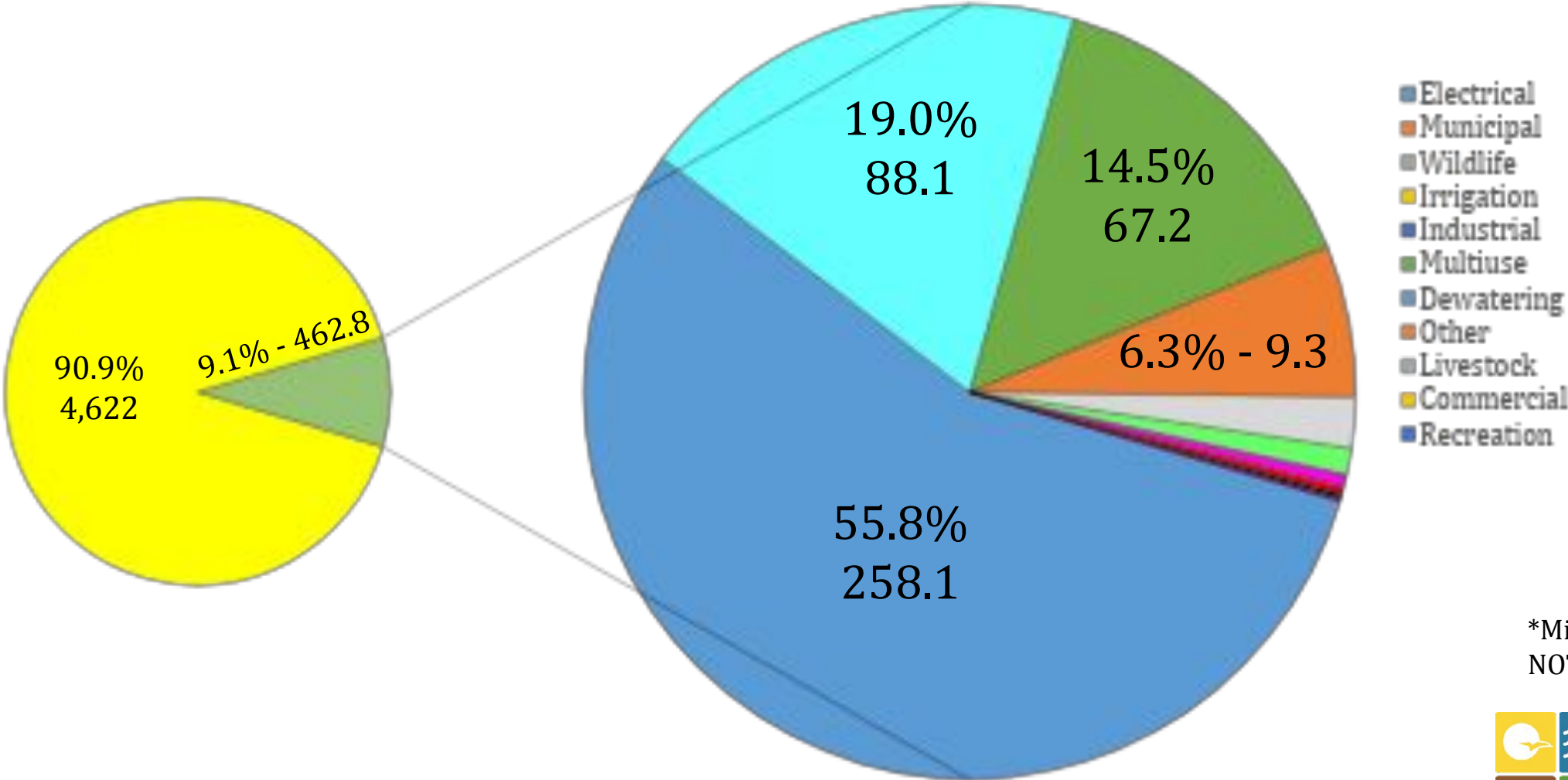
- Differences availability reflected in user data
  - Large, accessible groundwater in South
    - Irrigation wells numerous in river alluvium
    - Availability of aquifer allows for numerous and smaller production wells
  - Saline, limited groundwater in North
    - Limited irrigation
    - Centralized water sources



# Water Use Breakdown

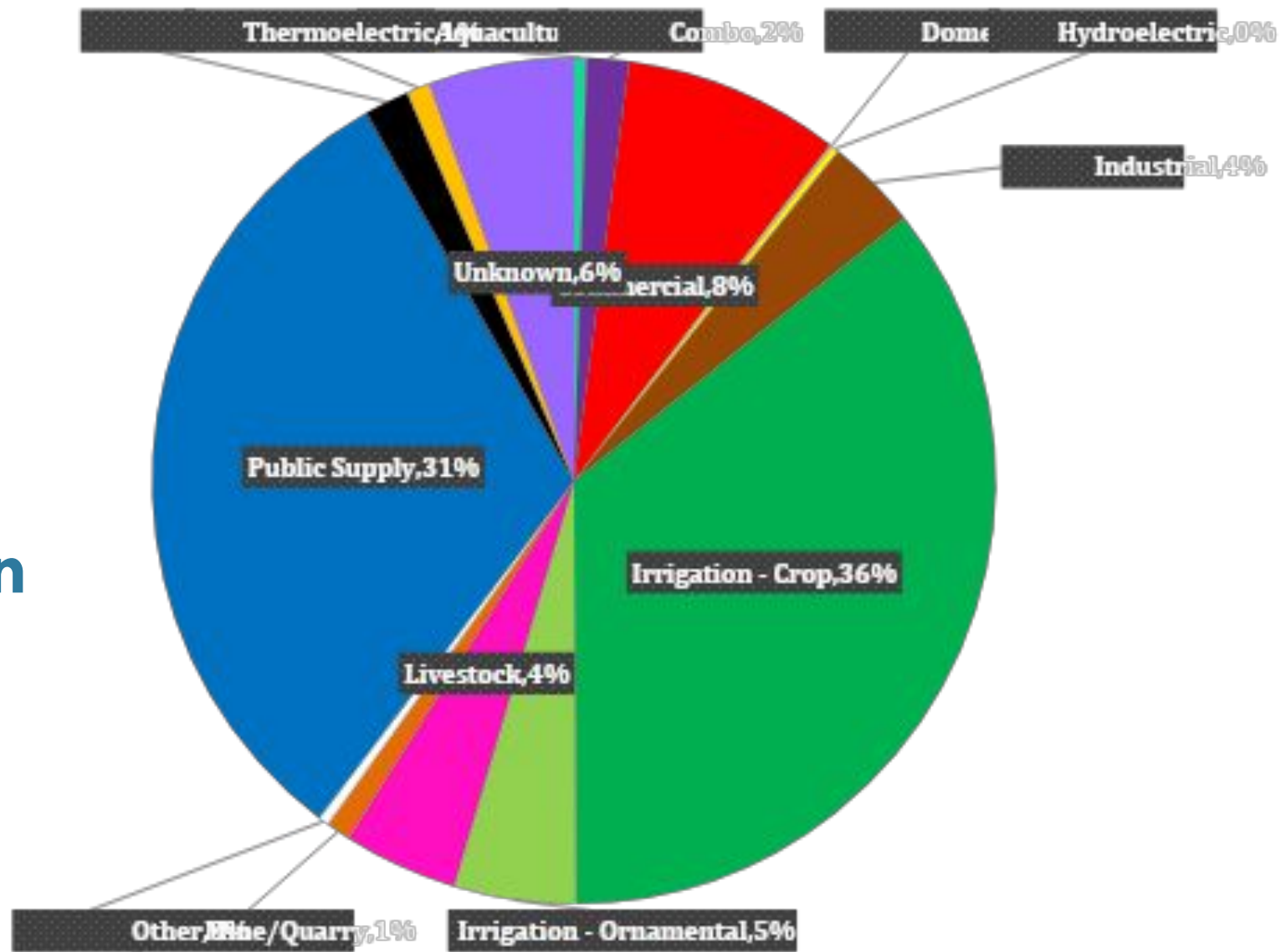


# 2019 Reported Water Use (Billions of Gallons)



\*Mine and quarry use is NOT included

# User Account Breakdown



# Missouri Water Rights

- Missouri is a riparian water rights state
- Water use is not regulated or permitted, but its use must be reported the following year
- Major Water User (MWU) Statutes of 1983 – RSMo 256.400-256.433
  - MWUs are entities who potentially can withdraw/divert 100,000 gallons per day (70 gallons/minute) from all their combined equipment
  - Must report by March 31<sup>st</sup> the following year or be labeled “a nuisance”
  - Report total annual withdrawals by well/intake
  - Maximum 3 staff tasked with recording and analyzing this data

# Lack of Enforcement...

- Nuisances
  - Can be referred to the Attorney General's office
  - No financial penalties or restrictions to water rights are in place at this time
- Without enforcement mechanisms, statutes are very difficult to regulate



"IF THE 'PUBLIC NUISANCE' CHARGE IS DROPPED, YOUR HONOR, MY CLIENT WILL PLEAD GUILTY TO 'PESKINESS.'"

## ... Leads to Varying Compliance

- Many are unaware of the statutes' existence
- Many are intimidated by the reporting process and procrastinate/forget
  - Computer glitches can also discourage reporting
- Many do not have water meters and are unsure of how to estimate
- Many simply don't care enough and will risk the consequences

# Renewing our Purpose and Goals

- Main Questions:
  - What do we and other governmental agencies want to see from this data?
    - As complete of a picture as possible of Missouri's water usage
    - Volumes, timing, purpose and location (3D) of withdrawals
    - Scientific and legal uses for both
  - What does the general public want to see from this data, or from Water Resources as a whole?
    - Ensure the longevity of Missouri's water
    - Water use reporting will not turn into water use regulating
- How will we adjust the program to meet these objectives?
  - Better quality data to estimate an gaps
  - **Better outreach to have a more robust dataset**

# Solution: Changing Our Mindset and Approach

- Approaching the problem as regulators, with little real regulating authority, is inefficient
- Utilize improvement tactics used with voluntary surveys
  - Remove any barriers
  - Work with partners to promote the survey
  - Explain why this is important to the individual
  - Develop relationships and be willing to put in the extra effort
- Critical for small business / individual users



Reporting is still a legal requirement, it is still communicated as a requirement, and many MWUs treat it as such. These strategies are used to improve our compliance amongst those who don't already consistently report

# Compliance Issues

- Many are unaware of the statutes' existence ☐  
Advertise in effective ways (clubs, meetings, even radio & newspaper)
- Many are intimidated by the reporting process and procrastinate/forget
  - Computer glitches can also discourage reporting ☐  
Create a simplified reporting system with help resources
- Many do not have water meters and are unsure of how to estimate ☐  
Develop methods and tools to estimate with what they do know
- Many simply don't care enough and will risk the consequence ☐ Develop products that show the value of water use data and why they should care

# Water Use Reporting System (WatURS)

- Upgrade from 2009
- Based in ESRI products
  - Utilize GIS capabilities to improve locations
  - Incorporate dashboard capabilities
- Focus on user-friendliness and guidance
- Introduce mobile reporting
- Restructuring of database and website
- Detailed planning initiated late 2019
  - Very early testing has begun
  - Roll out by 2023 reporting season?



# 2009

### Water Use Information

Withdraw ID: 70010457

Total Annual Usage: 10,000

Unit: GALLONS

Acres Irrigated: 40

Inches Applied: 0.0

Feet Applied: 0.0

Water Draw Type: WELL

User Description: Dummy1

Status: ACTIVE

Year Drilled: 2000

Well Certification Number: PRELAW

Log Main ID:

Casing Depth (ft.): 50

Total Depth (ft.): 100

Aquifer: UNKNOWN

PWS Well ID:

Formation Top:

Formation Bottom:

Pump Capacity (gpm): 50

Measurement Type: ESTIMATED

County: ADAIR

Township:

Range:

Land Grant:

Latitude: 36.76388888888889

Longitude: -92.76388888888889

### Crops And Acres:

| Crop                            | Acres | Method | Comment |
|---------------------------------|-------|--------|---------|
| <div>Edit Water UseDelete</div> |       |        |         |

Withdraw ID: 70010458

Total Annual Usage: 2,172,340

Unit: ACRE-INCHES

Acres Irrigated: 40

Inches Applied: 2.0

Feet Applied: 0.0

Water Draw Type: SURFACE INTAKE

User Description: Dummy

Status: ACTIVE

Year Established: 1900

Water Body Name: Schuman Pond

Water Body Type: POND

HUC8 ID:

HUC8 Name:

Pump Capacity (gpm): 1,000

Measurement Type: METERED

County: ADAIR

Section: 5

Township: 36

Range: 40W

Land Grant:

Latitude:

Longitude:

### Crops And Acres:

| Crop | Acres | Method | Comment |
|------|-------|--------|---------|
|------|-------|--------|---------|

# 2023

| Action Item - Report Surface Intake |                                              | Year Last Submitted |
|-------------------------------------|----------------------------------------------|---------------------|
| ✓                                   | Intake: 10753 - No Further Action Required   | 2021                |
| ✓                                   | Intake: 10771 - No Further Action Required   | 2021                |
| ⚠                                   | Intake: 10756 - <a href="#">Submit Usage</a> | 2020                |
| ⚠                                   | Intake: 10754 - <a href="#">Submit Usage</a> | 2019                |

# Help Resources

- Previously:
  - Estimation Calculators
  - FAQ's addressing concerns about the program
- Future:
  - Assistance features built directly into WatURS
  - Tutorial videos
  - Working with those who will not use the reporting system
    - Regional in-person help days
    - Continued use of paper resources

The screenshot shows the 'Water Usage for Livestock by Animal Type' calculator. It includes a dropdown menu for livestock type, input fields for average daily consumption, number of animals, and number of days. A 'Calculate' button is present, followed by a display showing '0 gallons' and a 'Copy' button.

Missouri Department of  
**Natural Resources**  
Major Water Use Information System

By Inches Applied   By Pump Capacity   By Animal Type   By Barn   By Sprinkler

**Water Usage for Livestock by Animal Type**

Choose livestock to set an average daily consumption in gallons value or you may provide your own.

Average daily consumption in gallons:

Number of animals:

Number of days water was consumed:

# Outreach Efforts

- Critical for smaller, more independent users
  - Irrigators (Crop and Ornamental)
  - Livestock Operations
- Working through partners may be the key
  - DNR Soil & Water Conservation for irrigators
  - DNR Public Water for water supply systems
  - Commodity meetings for livestock and irrigation
- Are there other services WRC staff can provide that can open these doors?
- Goal: Build relationships and trust with our water users
  - Multi-generational effort

