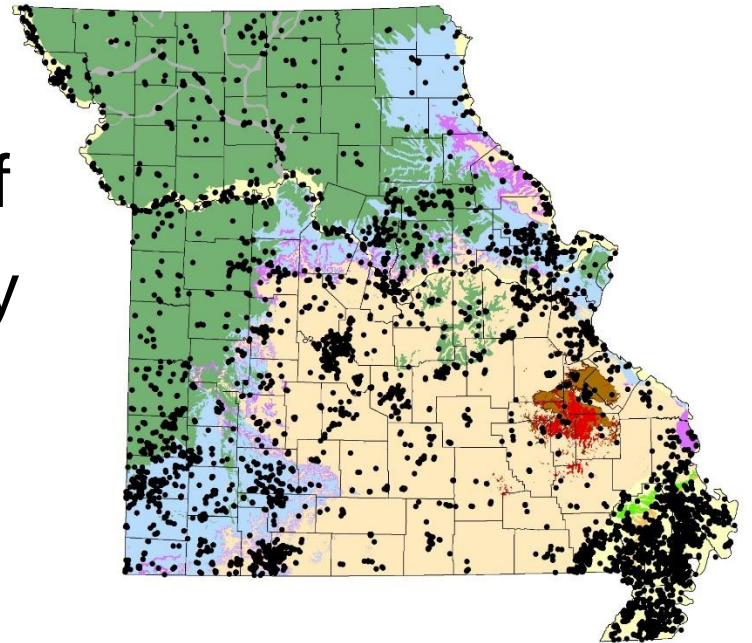


Missouri Major Water Users Reporting and Use of Water Data

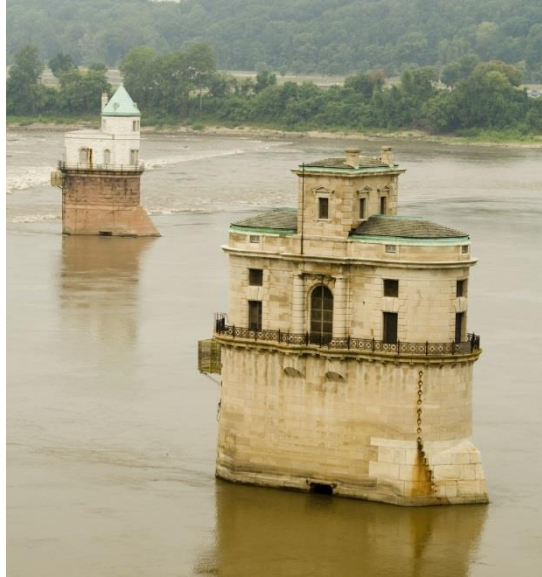
Scott Kaden, R.G.
Groundwater Section Chief
Missouri Geological Survey





MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Major Water Usage...



What is a Major Water User?

Missouri State Statutes RSMo 256.400-433 says...

A major water user is any person, firm, corporation or other user, that has equipment with the capability to withdraw or divert 100,000 gallons or more per day (70 gallon per minute) from any stream, river, lake, well, spring or other water source.

If a water user has multiple withdrawals, the total amount of water that can be produced is added to determine if they are considered a major water user.

Missouri's Major Water Users Law DOES NOT regulate how much water can be used or asses a usage tax. It DOES NOT affect the common law water rights of any person or organization. Its purpose is only to gather water-use data.



Major Water Use Categories

- Municipal – *public, private and rural water suppliers*
- Commercial – *hotels, restaurants, office buildings or institutions*
- Industrial – *industrial use*
- Fish and Wildlife – *fish and wildlife including aquaculture*
- Livestock – *livestock watering, feedlots, dairy operations*
- Electrical – *nuclear, hydro or thermo power generation*
- Drainage and Dewatering - *mining*
- Irrigation – *ornamental or agricultural*
- Other – *comment box*

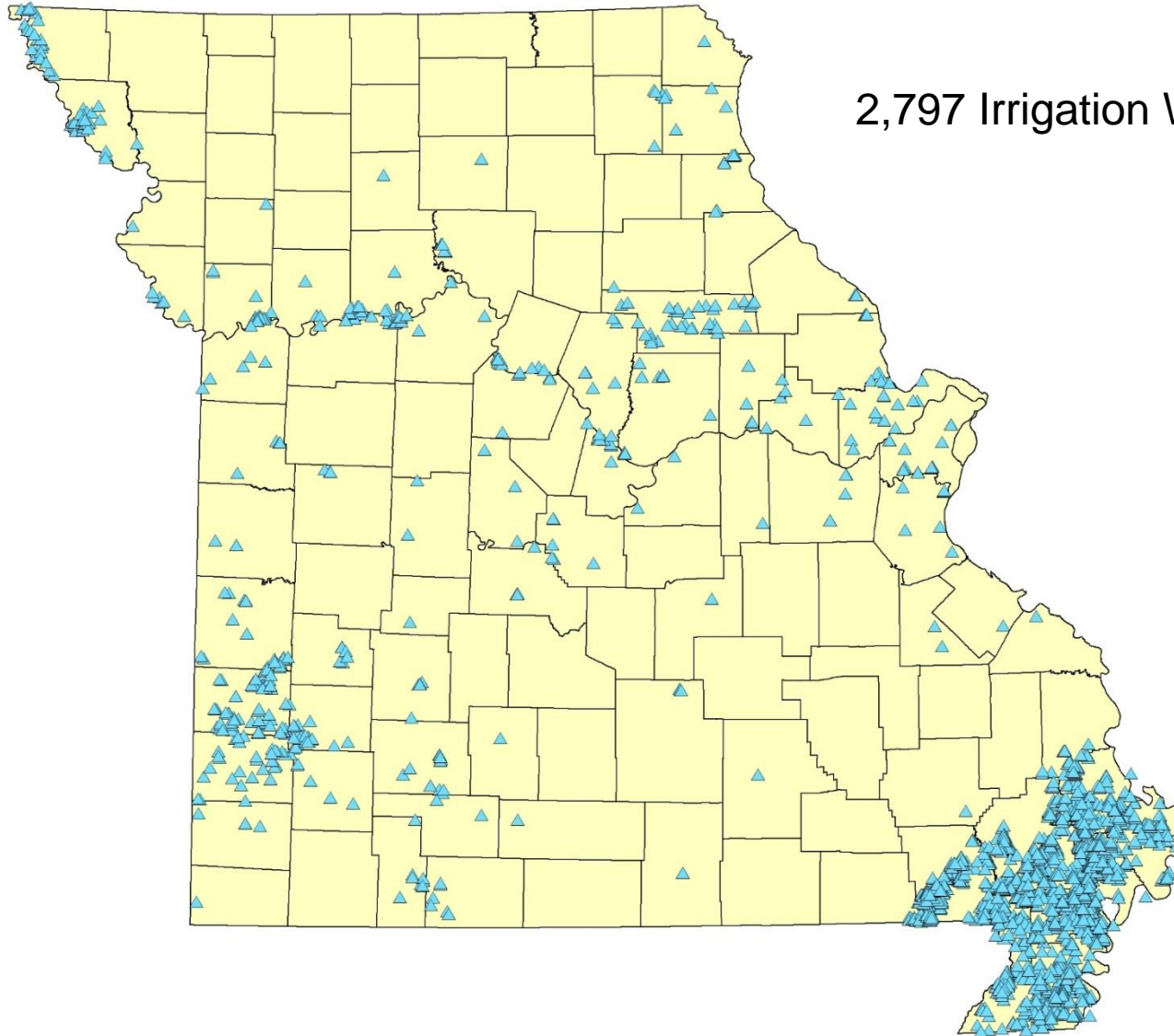
How is Water Use Data Collected in Missouri?

- Data is collected annually January-March for previous year.
- Data is reported by user via submittal of water report form or using online reporting system.
- Water user submits total water used and percentage of water use category.
- If the withdrawal has a meter, report the actual amount of water produced.
- If the withdrawal is not metered, estimates are acceptable
 - A well has a 3,000 gpm pump and is used 8 hours per day for a total of 45 days.
 - $3,000 \text{ gal/min} \times 480 \text{ min/day} \times 45 \text{ days} = 64,800,000 \text{ gallons}$
 - A hog confinement operation operates year round and has four barns that each house 3,500 hogs weighing 25-50 lbs.
 - Average water consumption for hogs this size is 1.2 gal/day
 - $3,500 \text{ hogs/barn} \times 4 \text{ barns} \times 1.2 \text{ gallons/hog/day} \times 365 \text{ days} = 6,132,000 \text{ gallons}$



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

2018 MWU Withdrawals (Irrigation)

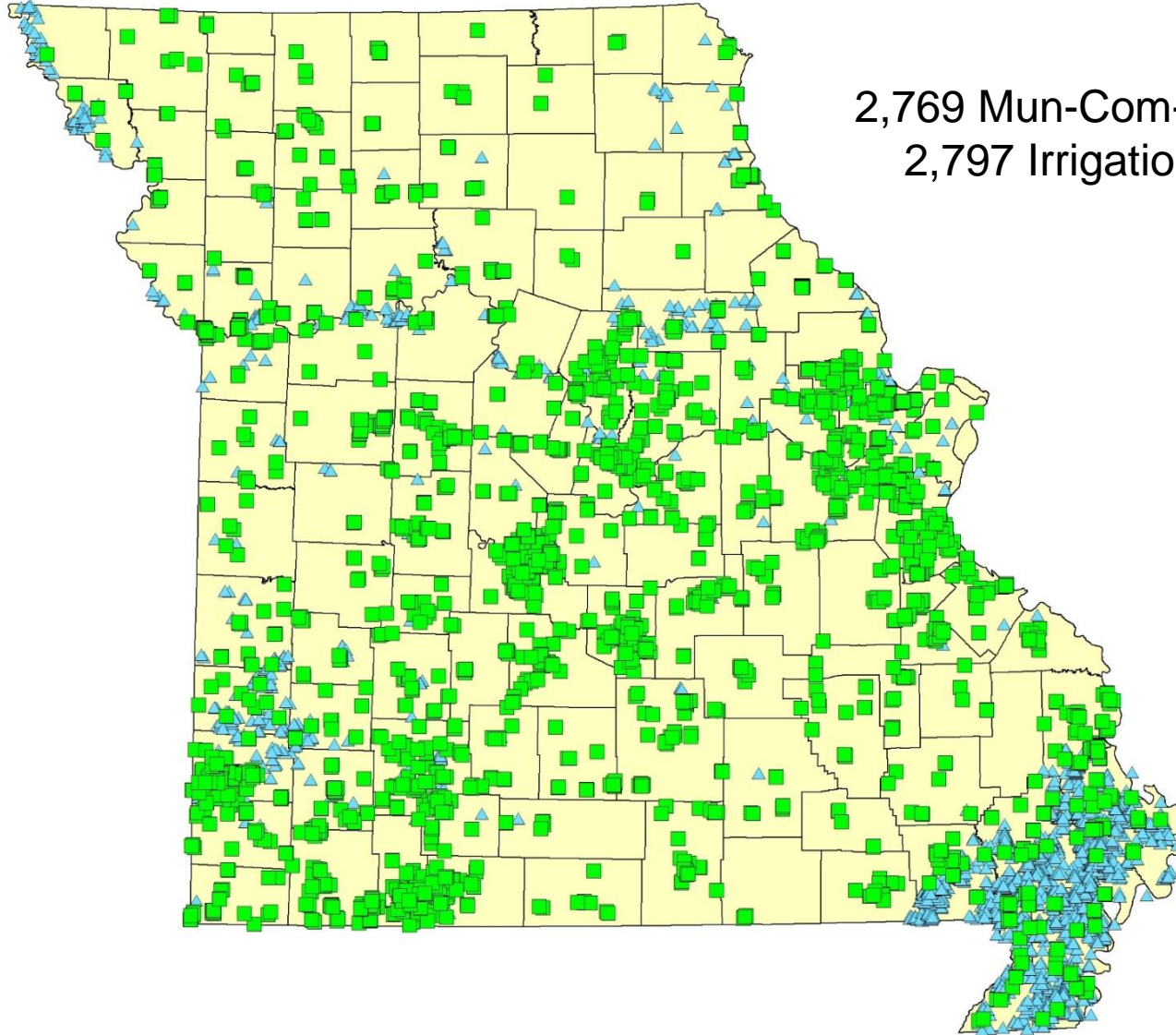


2,797 Irrigation Withdrawals



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

2018 MWU Withdrawals (Municipal, Commercial, Industrial and Irrigation)

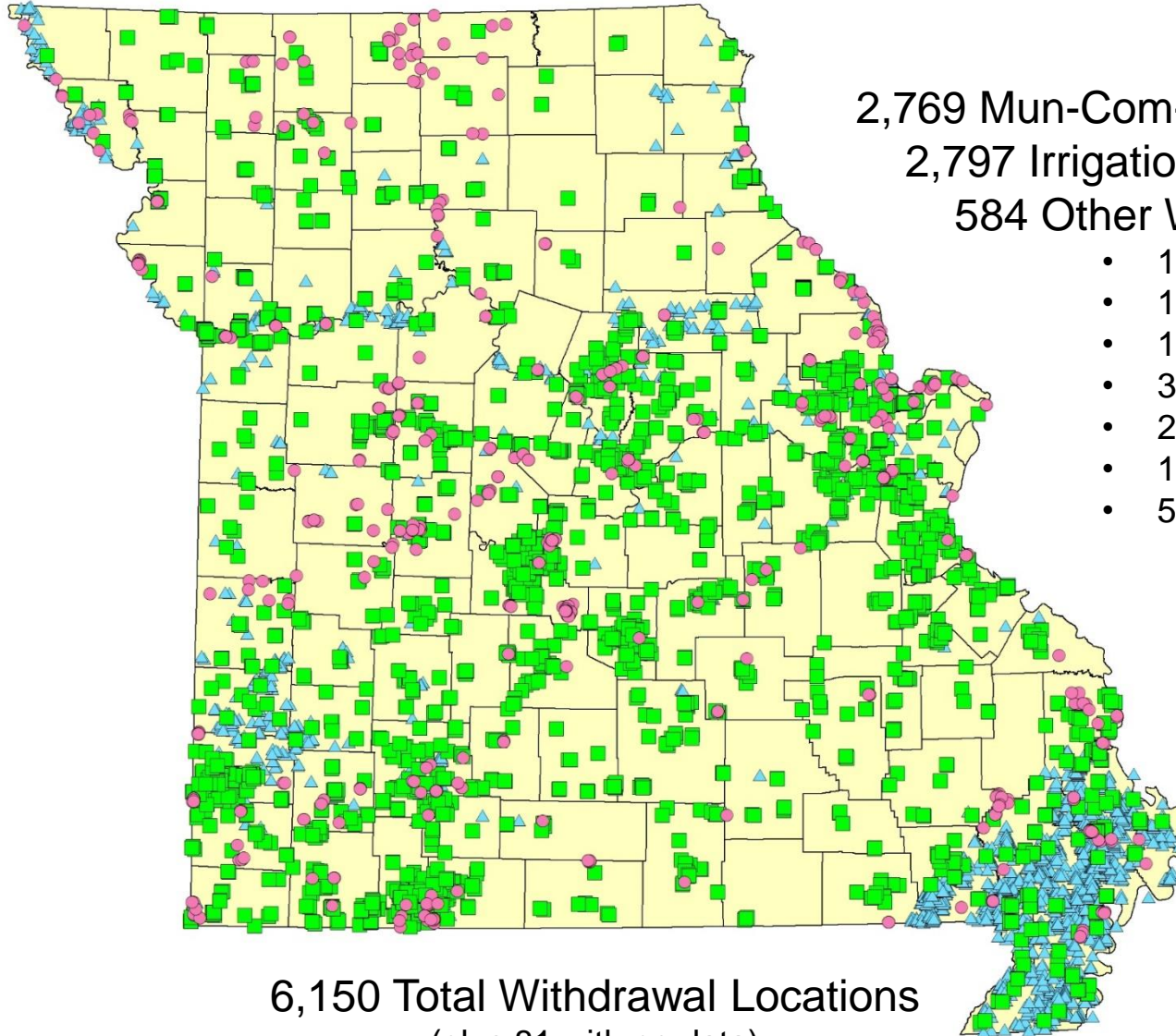


2,769 Mun-Com-Ind Withdrawals
2,797 Irrigation Withdrawals



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

2018 MWU Withdrawals (All Uses)



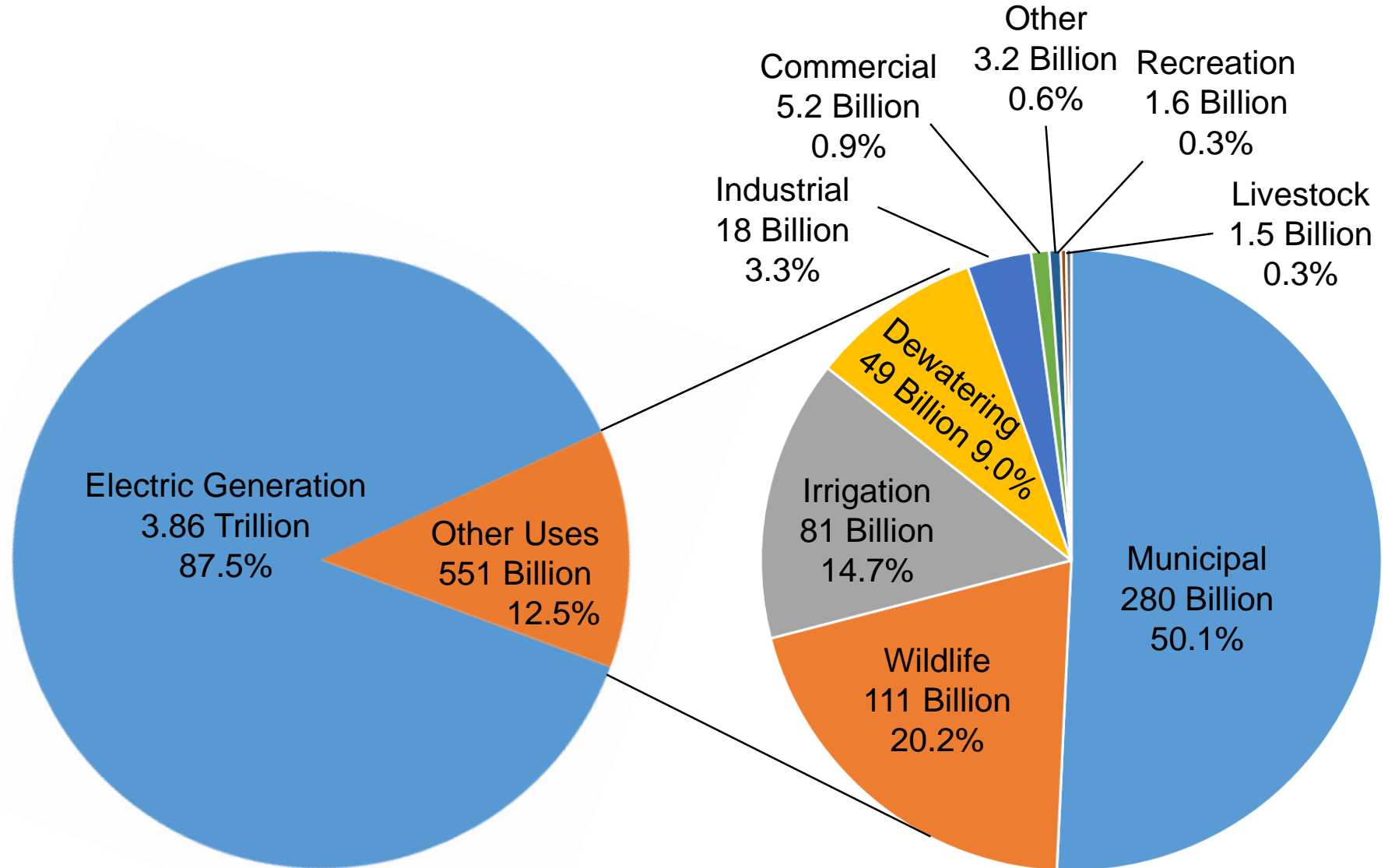
2,769 Mun-Com-Ind Withdrawals
2,797 Irrigation Withdrawals
584 Other Withdrawals

- 178 Wildlife
- 150 Livestock
- 126 Electric Generation
- 38 Recreation
- 23 Multiuse
- 10 Mine Dewatering
- 59 Other

6,150 Total Withdrawal Locations
(plus 81 with no data)



2018 MWU Withdrawals (in gallons)





MGS-WUDR Grant Projects

- Education!!
 - Development of fact sheet and brochures
 - Communication (phone calls, emails, standard letter)
 - Presentations at conferences
- Identify water used for golf course irrigation
 - 300 golf courses: 105 are MWU, 117 are not, 79 need additional followup
- Determine water source for all MWU withdrawal points
 - Identify aquifer for groundwater sources and HUC-8 for surface water sources
- Determine water quality (fresh vs saline water) for all water sources

MGS-WUDR Grant Projects

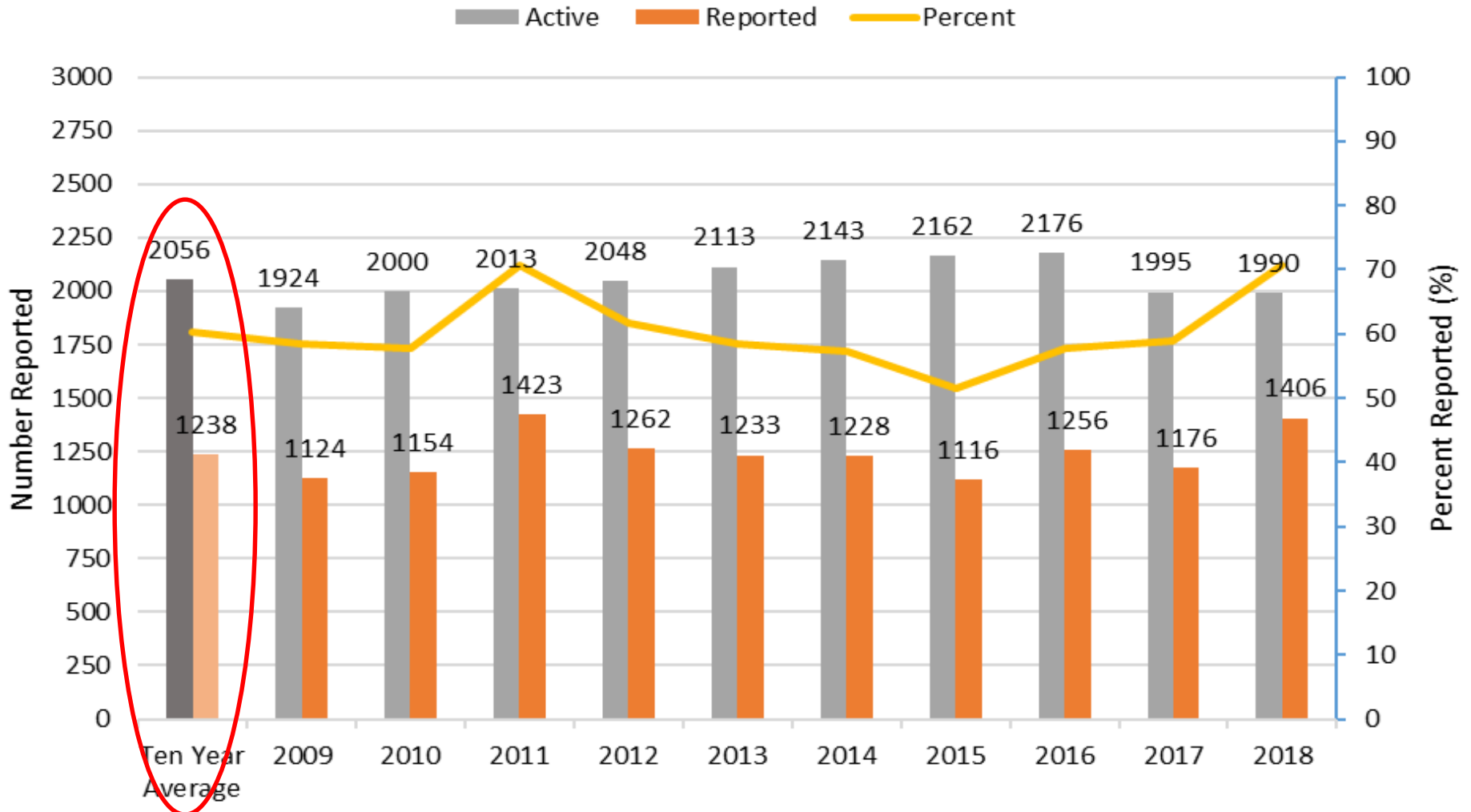
- Determine irrigated acres for Missouri's golf courses
- Add quality assurance check for water reporting
 - Annual water usage cannot exceed pump capacity times number of days pumped
- Develop online tools to assist with water use estimates
 - Tools to be used by MWU who do not have meters, typically agriculture related
- Increase reporting received from livestock MWU
- Identify water returned to the system by thermoelectric generators vs the water lost due to the cooling process
- Update the Missouri state water plan



Reporting Compliance

Active vs. Reported MWU 2009-2018

Ten Year Average
2009-2018
60%





Major Water Use Irrigation Reporting

2012 Census of Agriculture (USDA)

- 114 Missouri counties reported irrigation
- Total irrigated land: 1,180,886 acres
 - 10 SEMO counties reported 1,014,732 acres irrigated
 - 86% of total Missouri irrigated acres
 - Other Missouri counties totaled 166,154 irrigated acres
 - 14% of total Missouri irrigated acres

2012 Major Water Users Data (DNR)

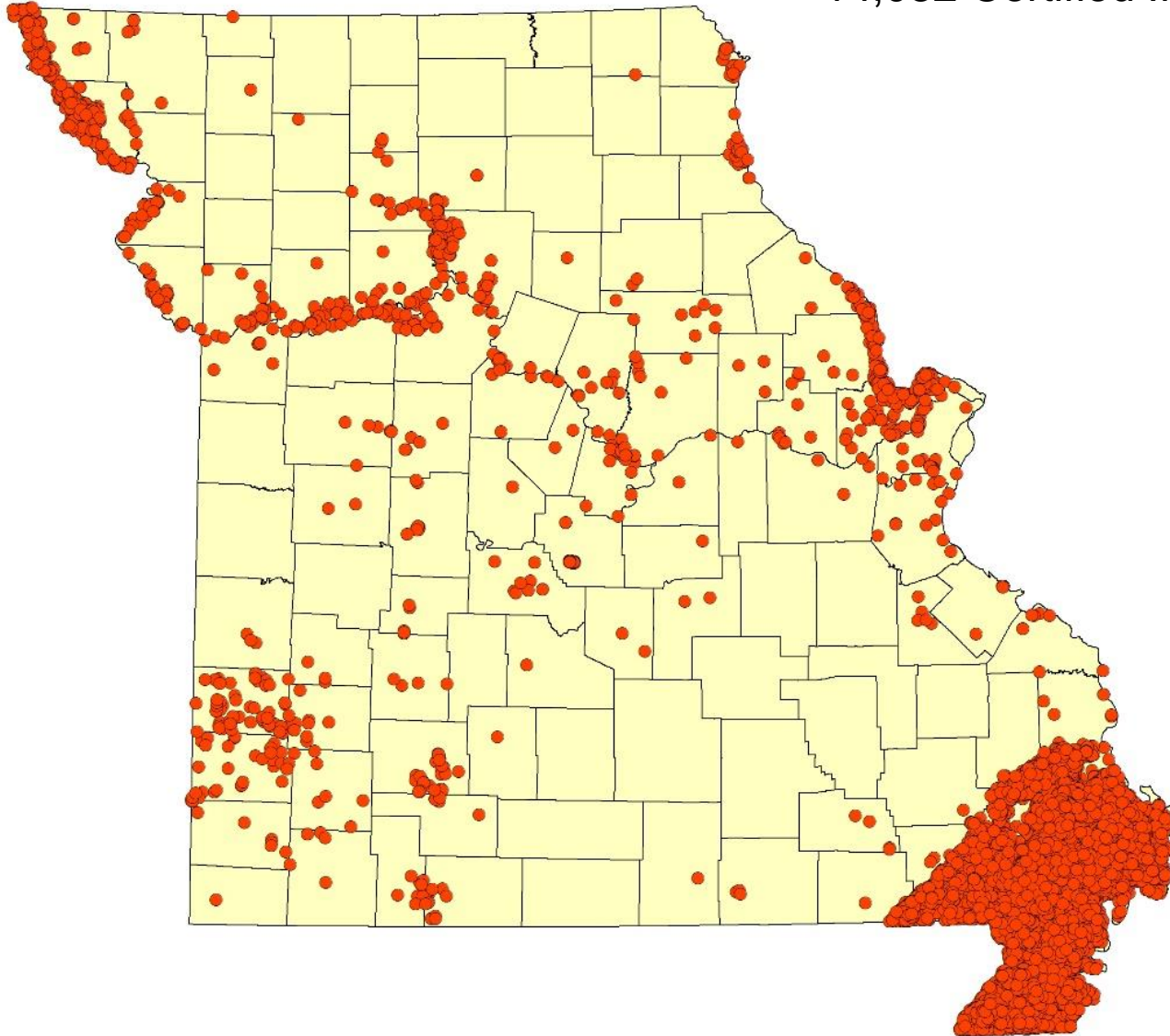
- 57 counties reported irrigation (50.0% of USDA)
- Total irrigated land: 162,969 acres (14% of USDA)
 - 10 SEMO counties reported 118,763 acres irrigated (12 % of USDA)
 - 73% of total MWU irrigated acres
 - Other Missouri counties totaled 44,206 irrigated acres (27% of USDA)
 - 27% of total MWU irrigated acres



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Irrigation Wells (MWU vs Certified Wells)

14,032 Certified Irrigation Wells





Irrigation Wells (MWU vs Certified Wells)

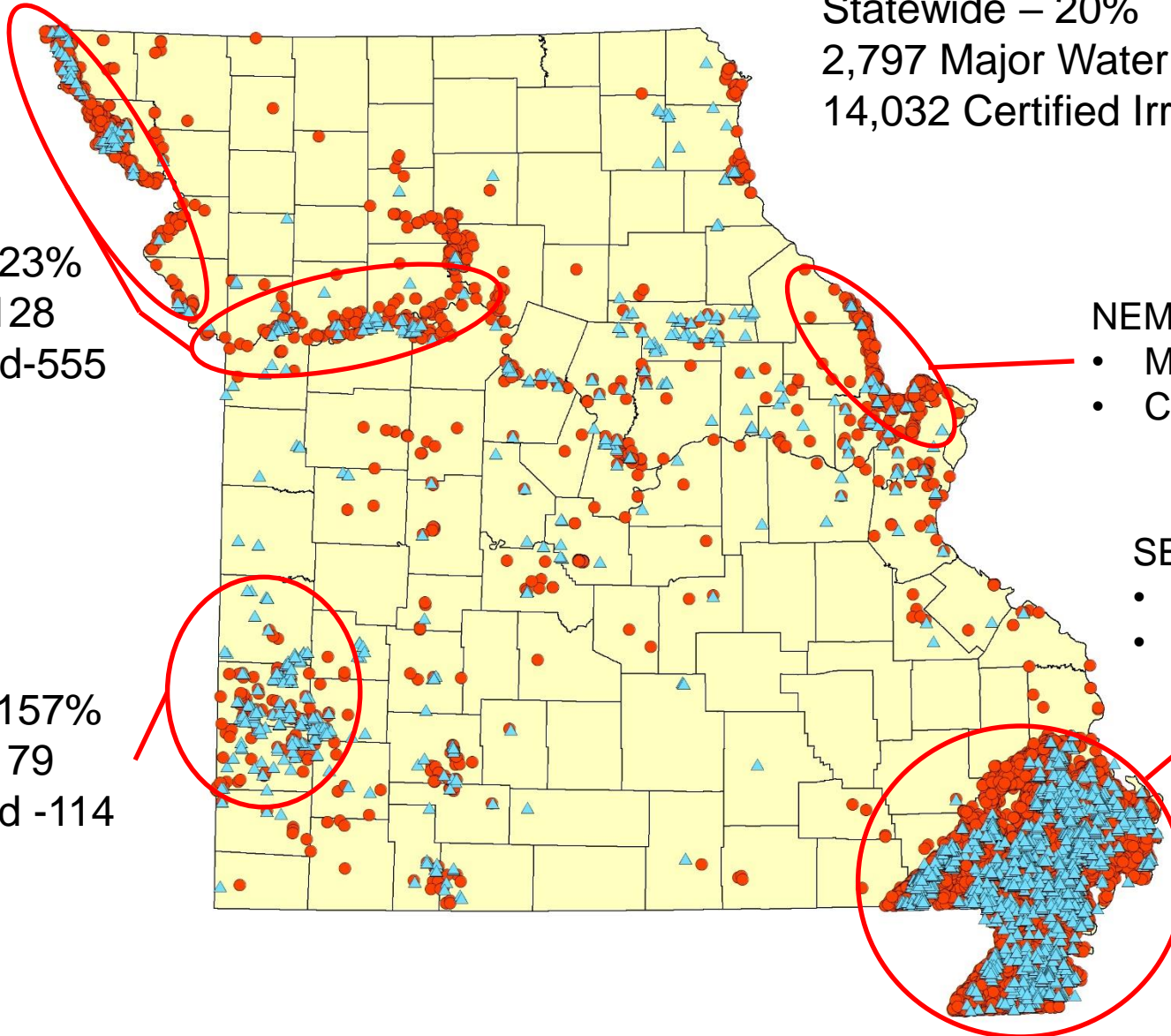
Statewide – 20%
2,797 Major Water User Irrigation
14,032 Certified Irrigation

NWMO – 23%
• MWU-128
• Certified-555

NEMO – 8%
• MWU-19
• Certified-242

SEMO – 17%
• MWU-2,125
• Certified-12,653

SWMO – 157%
• MWU-179
• Certified -114

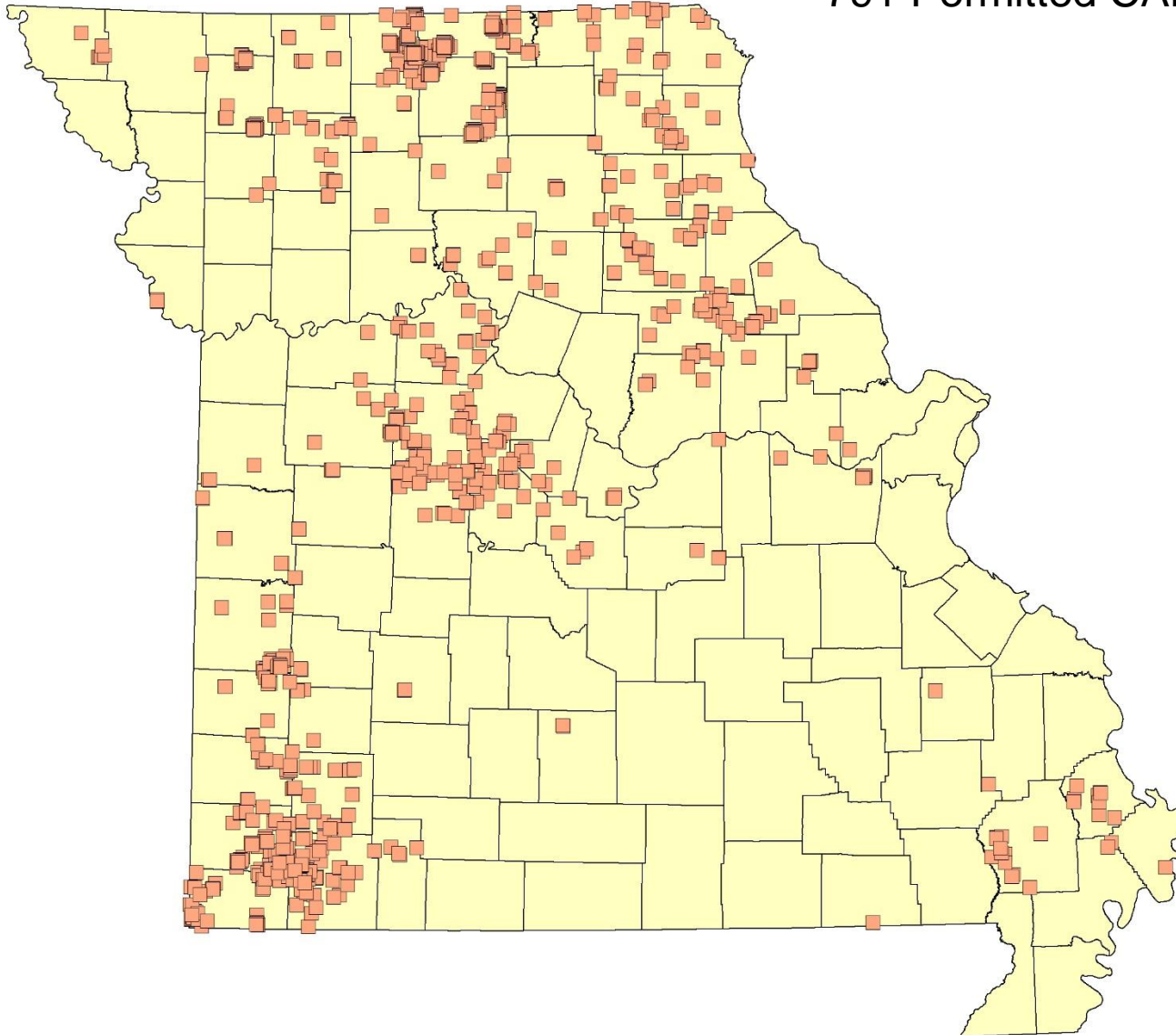




MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Livestock Water Use Reporting

791 Permitted CAFOs

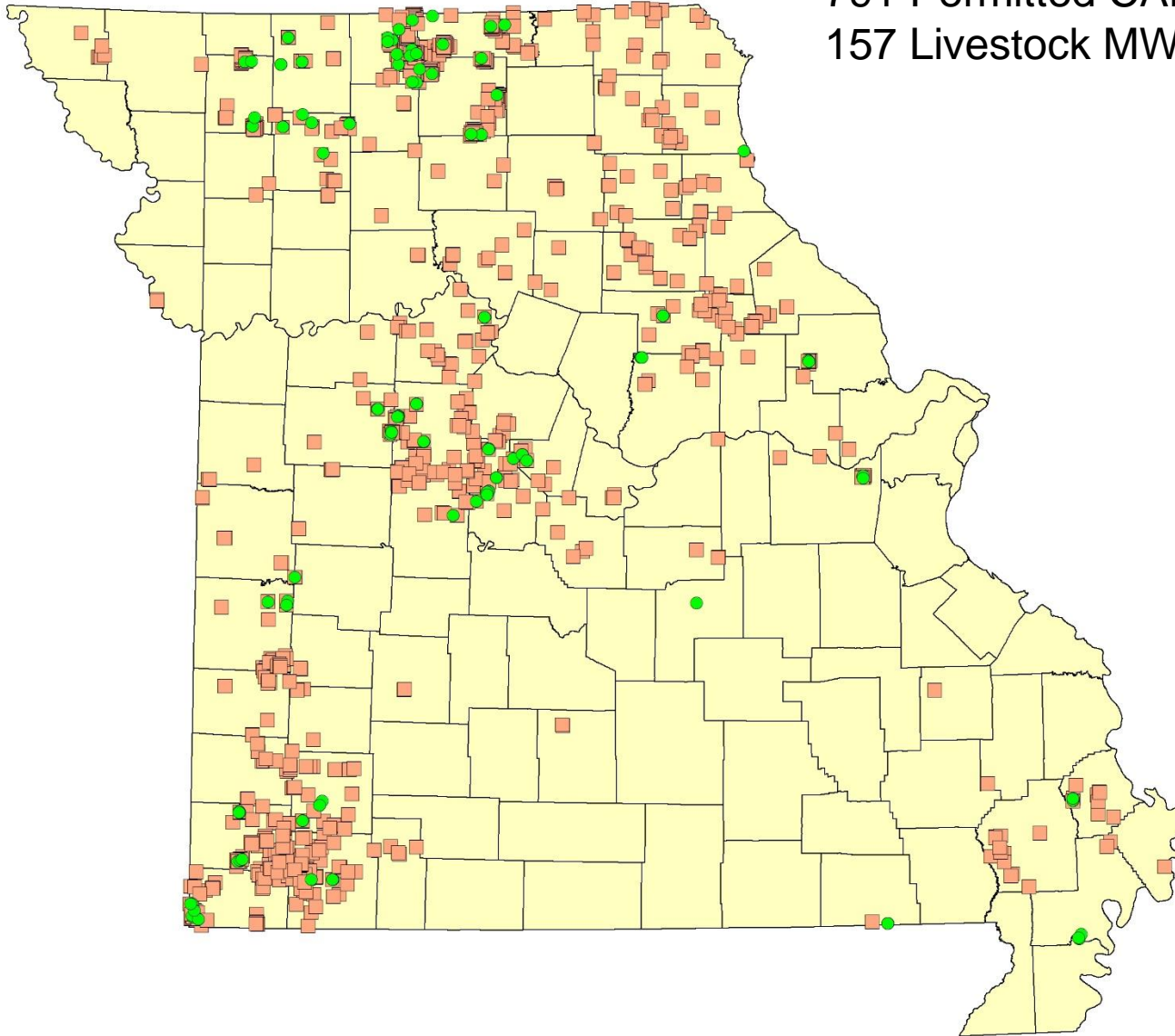




MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Livestock Water Use Reporting

791 Permitted CAFOs
157 Livestock MWU



What are challenges in getting water use data?

- There is no real penalty to the user for failure to report usage
- People think the certification of their well takes care of the MWU requirements
- People don't know about the reporting requirement
- People know about the requirement, but don't know how to register and report their water usage
- People know about the requirement and know how to report, but do not report their usage
 - Many forget despite numerous reminders from MGS
 - Many are intimidated by the process
 - Many do not want the government to know their water usage
- Types of data reported
 - Over reporting to stake their claim in case the government ever set usage limits
 - Under reporting in case the government ever established a usage tax
 - Actual usage reporting

What are important water use reporting issues and what are QA/QC standards in Missouri?

- The development of the water plan has highlighted the importance of water use data and the lack of high quality data in Missouri
- There are no standards for water data reporting in Missouri
 - Data can be reported as metered or estimated
 - Data is provided by the user and not verified by MGS
- Registered water users who do not report are followed up with multiple times to encourage submittal of data
- As part of the WUDR grant MGS is making attempts to reach out to groups of water users such as golf courses and livestock producers

What are gaps and future plans for water use reporting and technology in Missouri?

- The biggest gaps are the low compliance of reporting data and the poor quality of the data
- Plans are underway to revise the online reporting system to include a GIS component and increase user friendliness

What is an acceptable reporting schedule lag time and spatial accuracy in Missouri?

- Reporting “season” is January-March for the previous calendar year
- Data will be accepted anytime
- MGS requests locational data by latitude/longitude and township/range/section
 - Accuracy is questionable
 - Staff are working to cross check locations and edit as needed



Questions???

Scott Kaden
scott.kaden@dnr.mo.gov
573-368-2194

Missouri Department of Natural Resources
Missouri Geological Survey
Water Resources Center
www.dnr.mo.gov/geology/wrc