



September 16, 2025

# Davidson Creek

Watershed Protection Plan Development

TEXAS A&M  
AGRI LIFE

TEXAS STATE  
**Soil & Water**  
CONSERVATION BOARD

  
Texas Water  
Resources Institute  
*make every drop count*

Funding provided by the Texas State Soil and Water Conservation Board through the State Nonpoint Source Grant Program



# Meeting Agenda

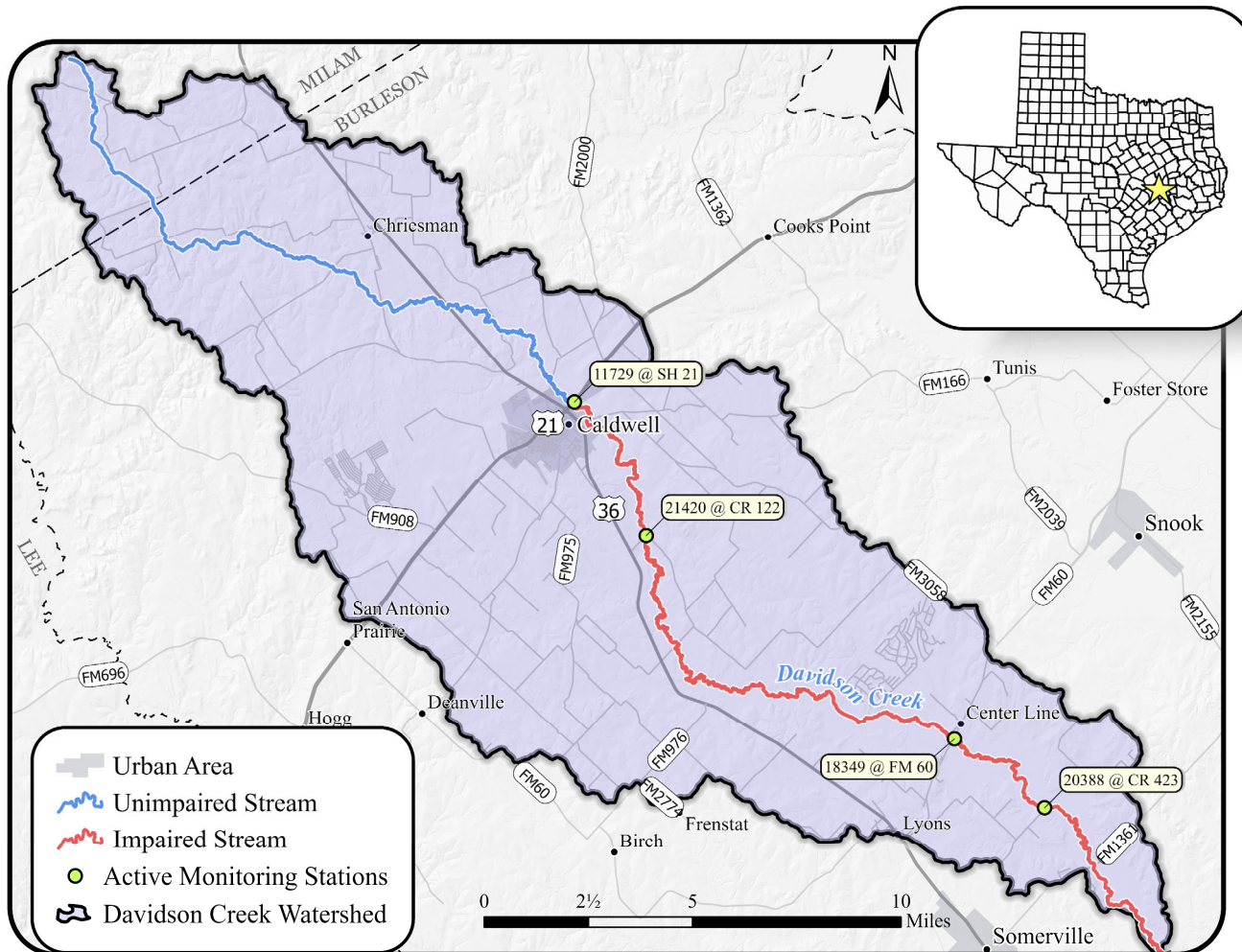
- Welcome and Overview
- Summary of Meeting #3
  - Updated animal and population numbers
- In-depth Water Quality Review
- Questions and Next Steps



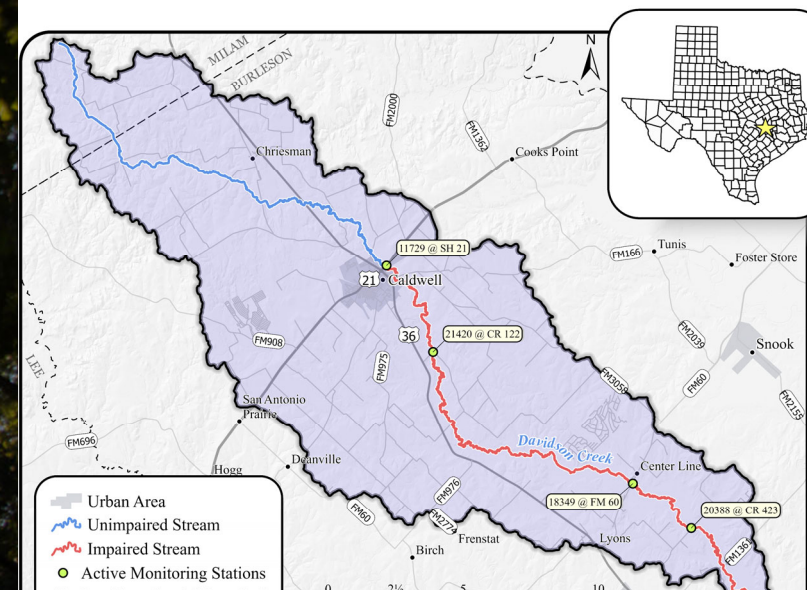
# Davidson Creek

## Water Quality

- Elevated bacteria – risk to human health
- Low dissolved oxygen – risk to fish & aquatic life



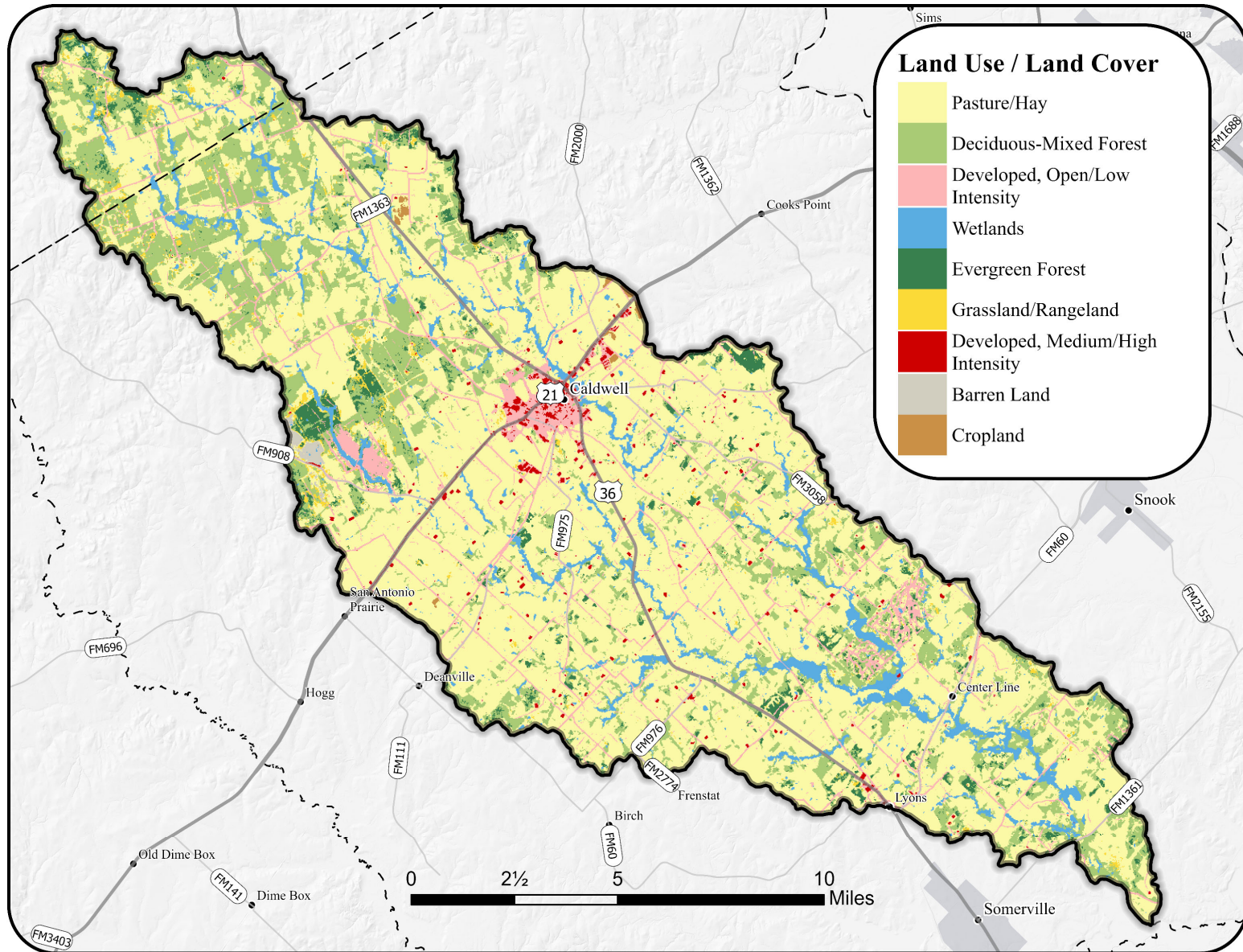
# Meeting #3 Recap





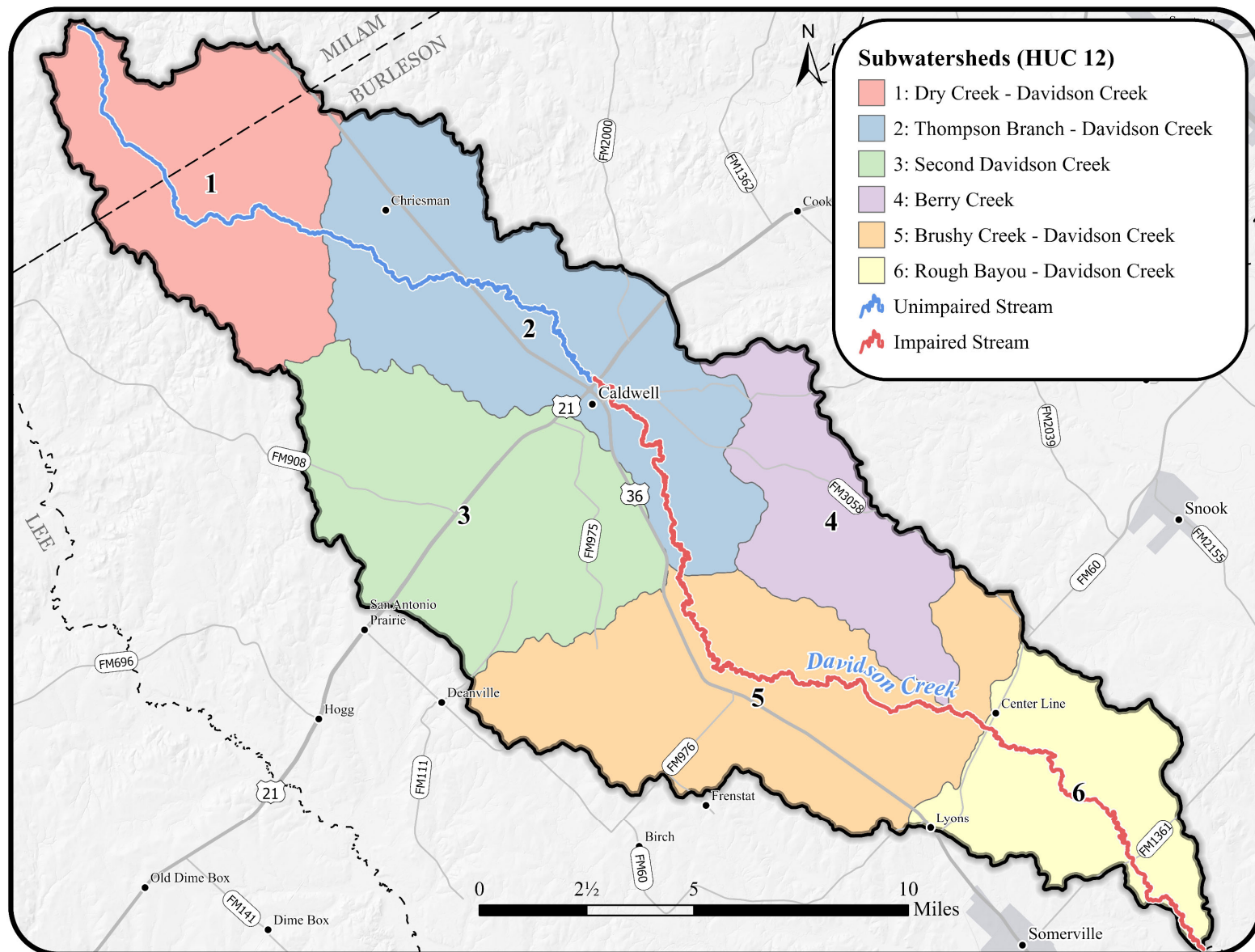
## 2023 Land Use

|               | Percent of Watershed |
|---------------|----------------------|
|               | 63.71%               |
|               | 18.55%               |
|               | 7.48%                |
|               | 5.10%                |
|               | 2.65%                |
|               | 1.18%                |
|               | 0.95%                |
|               | 0.23%                |
|               | 0.16%                |
| <b>Total=</b> | <b>100.00%</b>       |





# Subwatersheds



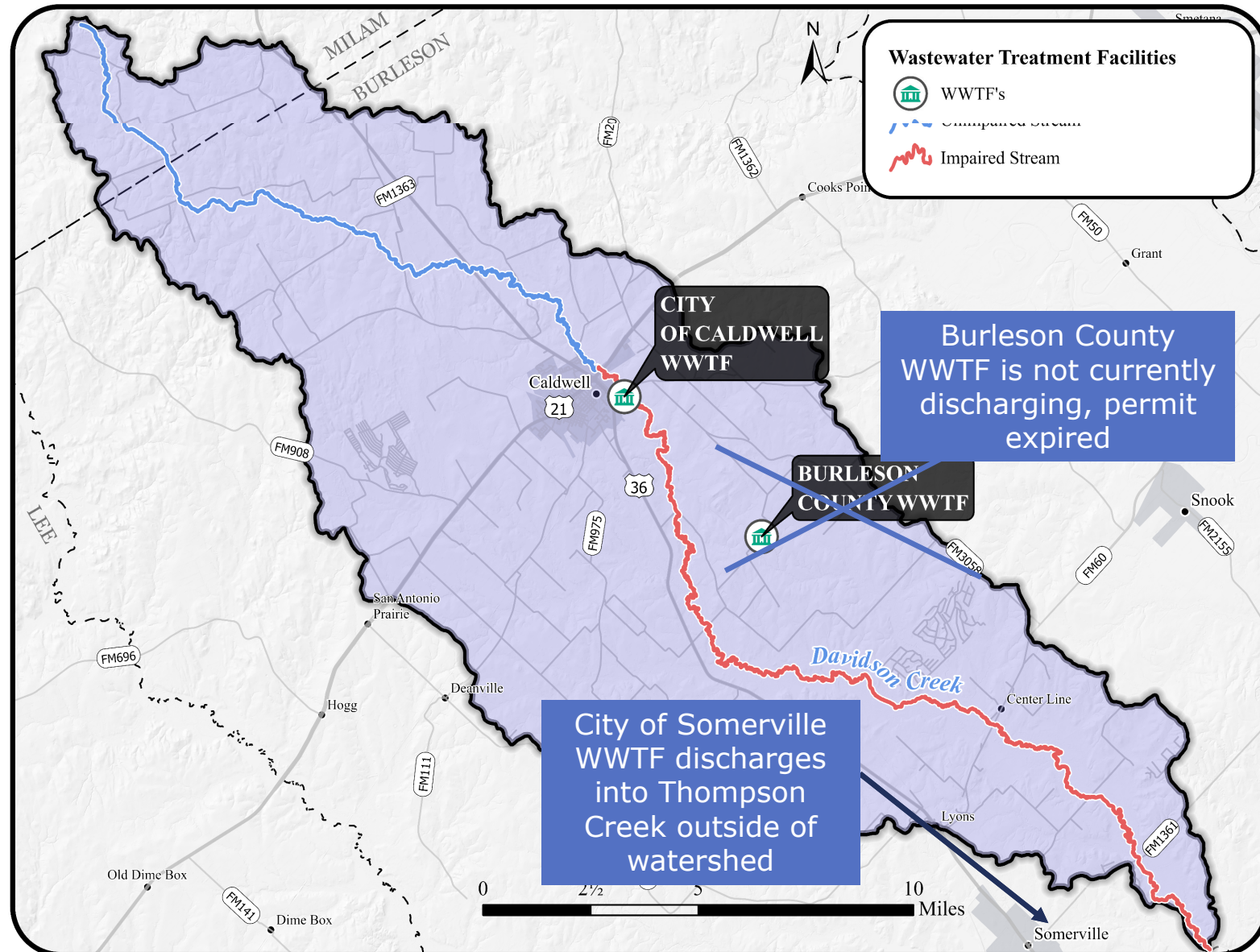


# Point Sources

- Wastewater treatment facilities (WWTF)
- Construction sites
- Concrete production
- Sanitary sewage overflows



# Wastewater Treatment Facilities





| Facilities                           | Flow (MGD*)             |                                          | <i>E. coli</i> (cfu/100 mL) |             | Number of Violations                                                                                                  |
|--------------------------------------|-------------------------|------------------------------------------|-----------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------|
|                                      | Facility Permitted Flow | Actual 3yr Average Facility Flow in 2025 | Daily Average               | Single Grab | Jan. 2022 – Jun. 2025                                                                                                 |
| City of Caldwell WWTF (Q0010813-001) | 0.711                   | 0.39778                                  | 126                         | 399         | <ul style="list-style-type: none"> <li>– 2 daily average <i>E. coli</i></li> <li>– 1 daily average Ammonia</li> </ul> |
| Bureau of County WWTF (Q0015306-001) | 0.075                   | NA                                       | 126                         | 399         | Permit has expired and not currently in the process for renewal                                                       |

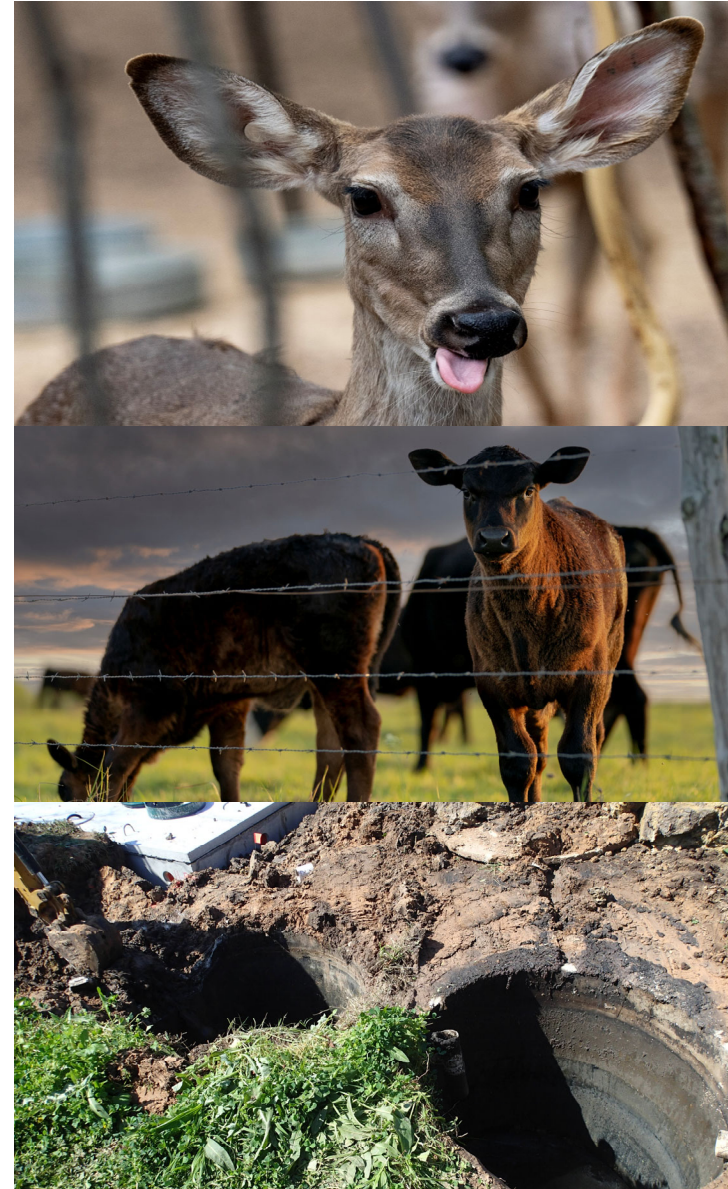
# Permitted Stormwater

- 8 active construction permits
- 1 active concrete production permit
- 1 sanitary sewer overflow incidents in the past 5 years



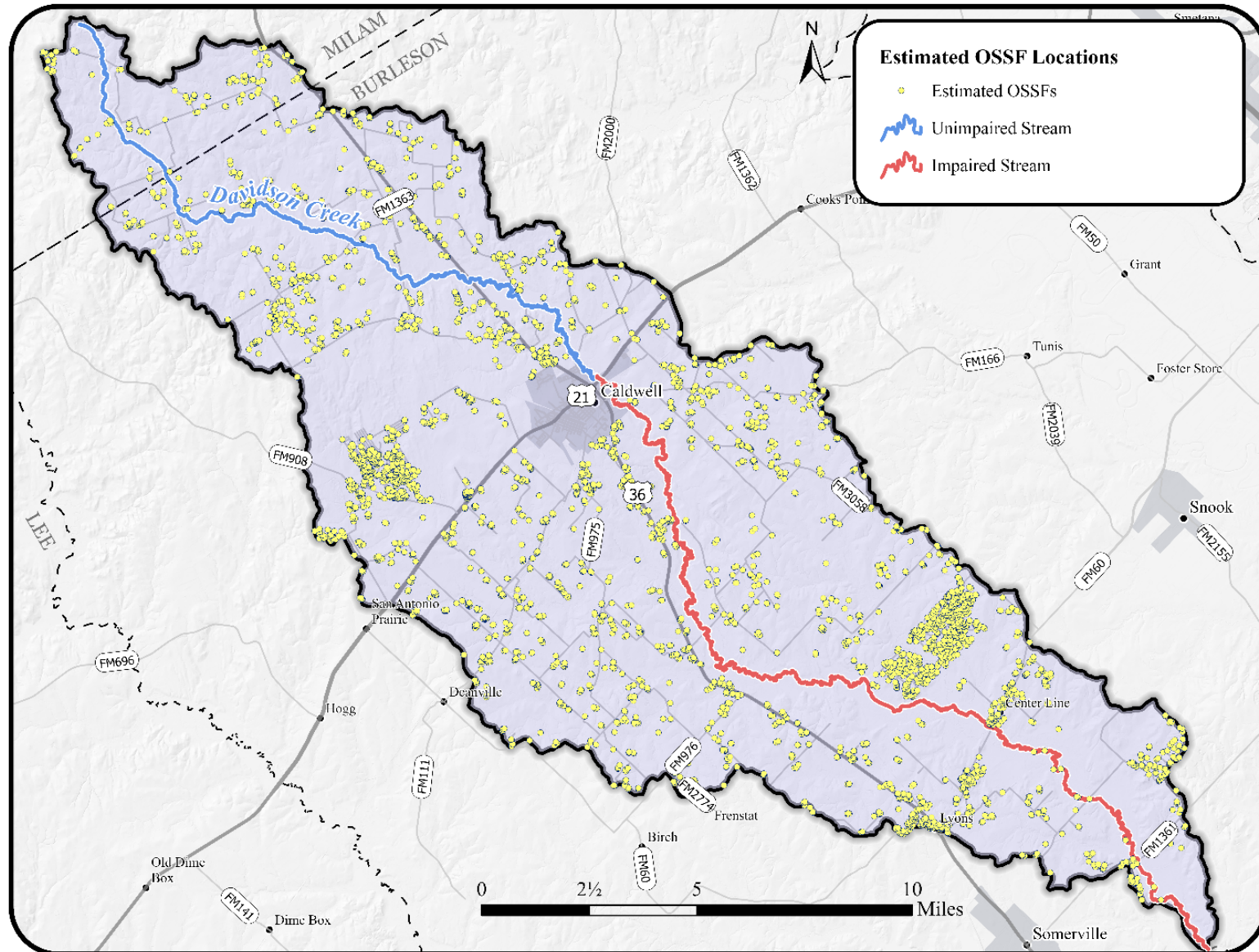
# Nonpoint Sources

- On-site sewage facilities (OSSF)
- Livestock (cattle, horses, goats, sheep, poultry)
- Deer and Feral Hogs
- Domestic Dogs



# On-site Sewage Facilities

- Estimated total OSSFs – **3,610**





# Cattle Population in Watershed – Method 1

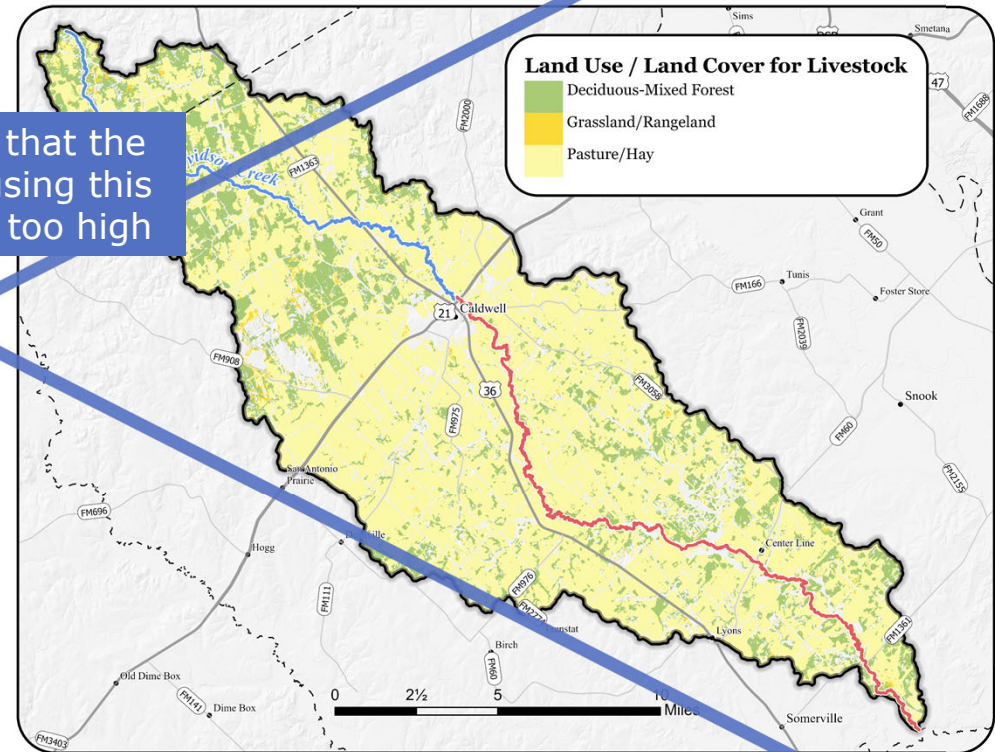
Estimated based USDA NASS county-level data

- Total Cattle – **22,421**
- Downscaled to watershed level

$$\frac{\text{grazeable land in watershed}}{\text{grazeable land in county}} \times \# \text{ of cattle in county}$$

- Grazeable land
  - Hay/pasture (improved pasture)
  - Grassland/Rangeland, Deciduous-Mixed Forest (unimproved pasture)

Determined that the total cattle using this method was too high



# Cattle Population in Watershed – Method 3

Estimate based on USDA  
Natural Resources  
Conservation Service  
recommend stocking  
rates

|                      | Grassland/<br>Herbaceous | Hay/<br>Pasture | Deciduous –<br>Mixed Forest |
|----------------------|--------------------------|-----------------|-----------------------------|
| Watershed<br>(acres) | 89,245                   | 1,659           | 25,981                      |

- Total Cattle – ~~32,512~~
  - 10 ac/head for unimproved pasture
  - ~~2~~ ac/head for improved pasture

- Total Cattle – **17,638**
  - 10 ac/head for unimproved pasture
  - **6** ac/head for improved pasture



# Other Livestock Populations

Estimated based on 2022  
USDA NASS county-level  
data

- Downscaled to  
subwatershed level



Determined total  
horses was too low

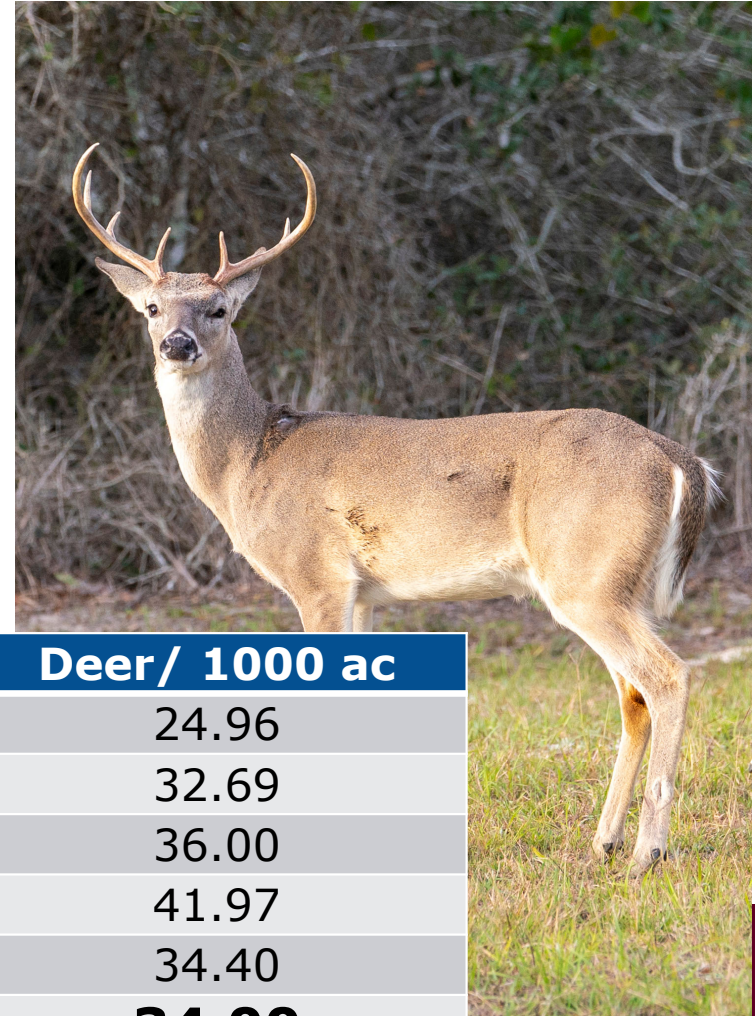
| Livestock in Watershed | Hogs/Pigs  | Sheep/Lambs | Goats      | Horse      | Poultry-Layers | Poultry-Broilers |
|------------------------|------------|-------------|------------|------------|----------------|------------------|
| Milam County           | 11         | 40          | 58         | 26         | 2,762          | 85,119           |
| Burleson County        | 158        | 369         | 389        | 373        | 73,638         | 1,585,547        |
| <b>Total Watershed</b> | <b>169</b> | <b>408</b>  | <b>447</b> | <b>399</b> | <b>81,400</b>  | <b>1,670,667</b> |

# Wildlife – Deer in Watershed

Estimated based on Texas Parks and Wildlife Department survey

- Total Deer – **4,352**
- Between 2015 and 2022
  - Croplands
  - Deciduous-Mixed Forest
  - Evergreen Forest
  - Pasture/Hay
  - Grassland/Rangeland
  - Wetlands

| 19 South               | Deer/ 1000 ac |
|------------------------|---------------|
| 2022                   | 24.96         |
| 2020                   | 32.69         |
| 2018                   | 36.00         |
| 2016                   | 41.97         |
| 2015                   | 34.40         |
| <b>Average Density</b> | <b>34.00</b>  |

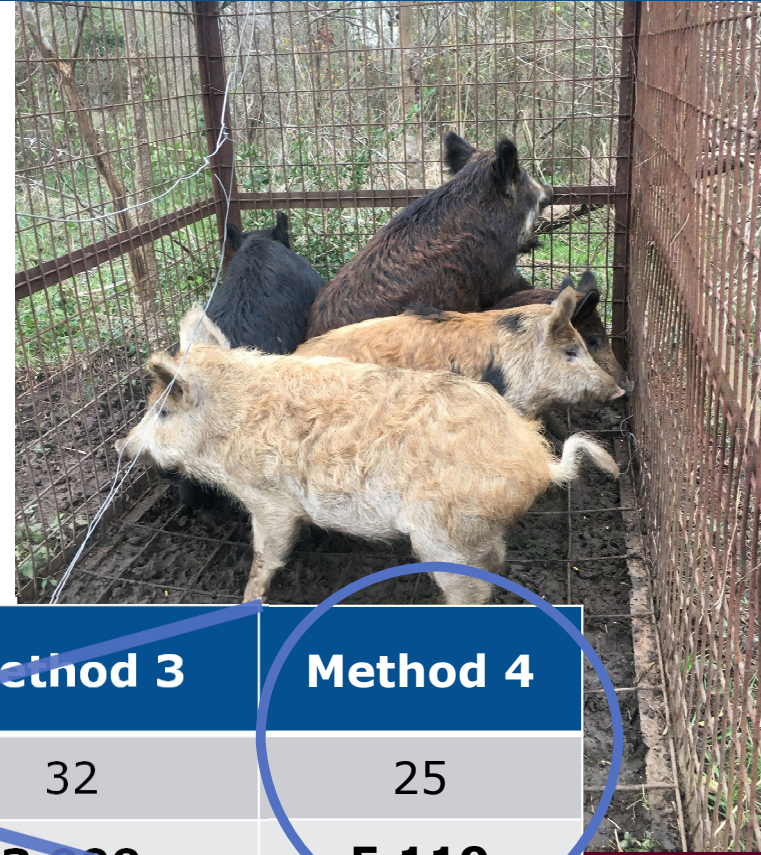




# Feral Hogs in Watershed

1.8 ~ 3.4 million (average 2.6 million) statewide based on "Feral Hog Population Growth, Density and Harvest in Texas"

- Estimation excludes barren and developed lands



|                    | Method 1         | Method 2         | Method 3         | Method 4     |
|--------------------|------------------|------------------|------------------|--------------|
| Density (ac/hog)   | 39               | 33.3             | 32               | 25           |
| Total in Watershed | <del>3,281</del> | <del>3,843</del> | <del>3,999</del> | <b>5,119</b> |

# Dogs in Watershed

- Total Dogs – ~~3,485~~
- Estimated based on 2024 American Veterinary Medical Association survey
  - About 45.5% of US households own dogs
  - Of those, the average number of dogs is 1.5

|                  | Households       | Dogs             |
|------------------|------------------|------------------|
| <b>Watershed</b> | <del>5,106</del> | <del>3,485</del> |



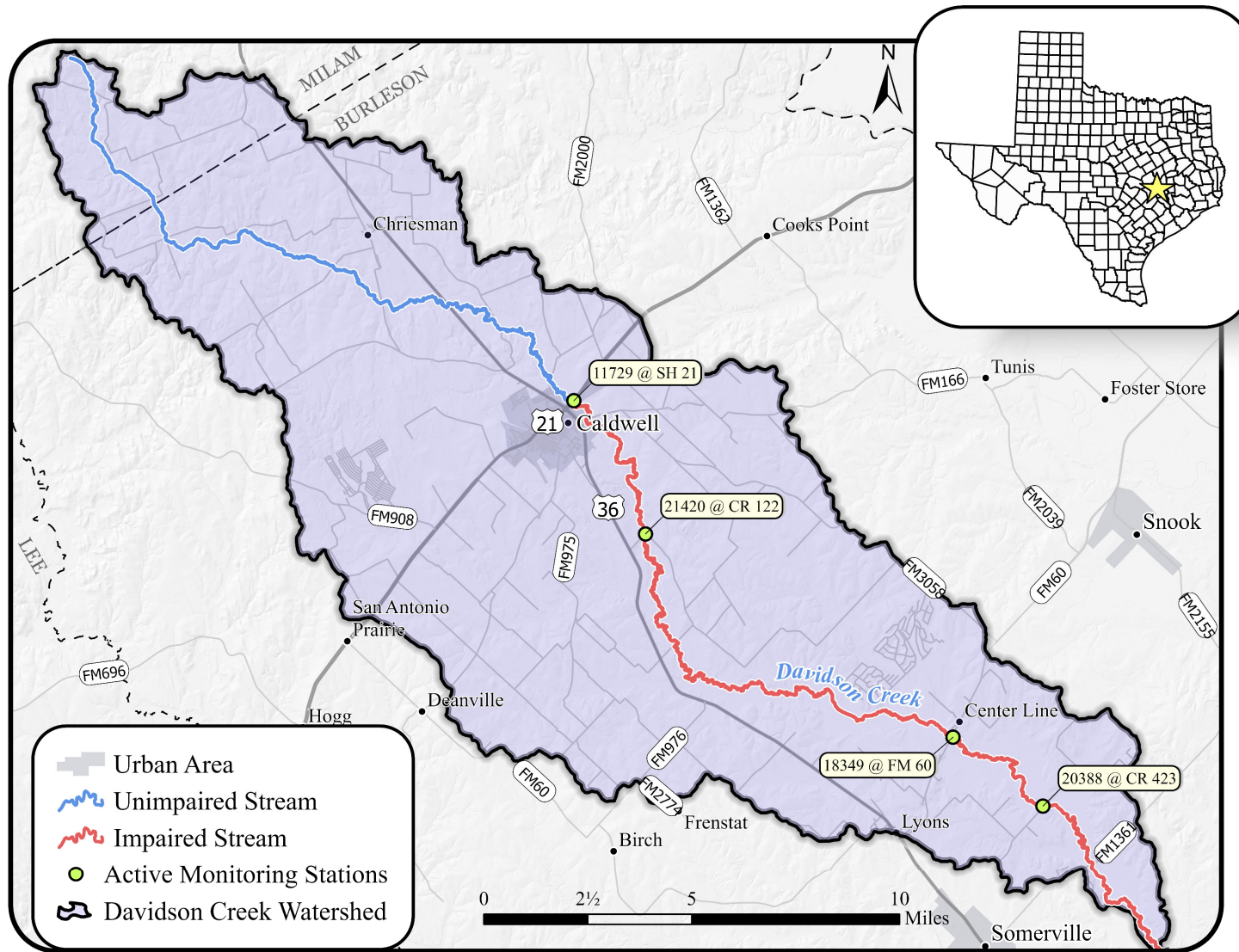
| Households | Dogs  |
|------------|-------|
| 5,761      | 3,932 |



# Water Quality in Davidson Creek

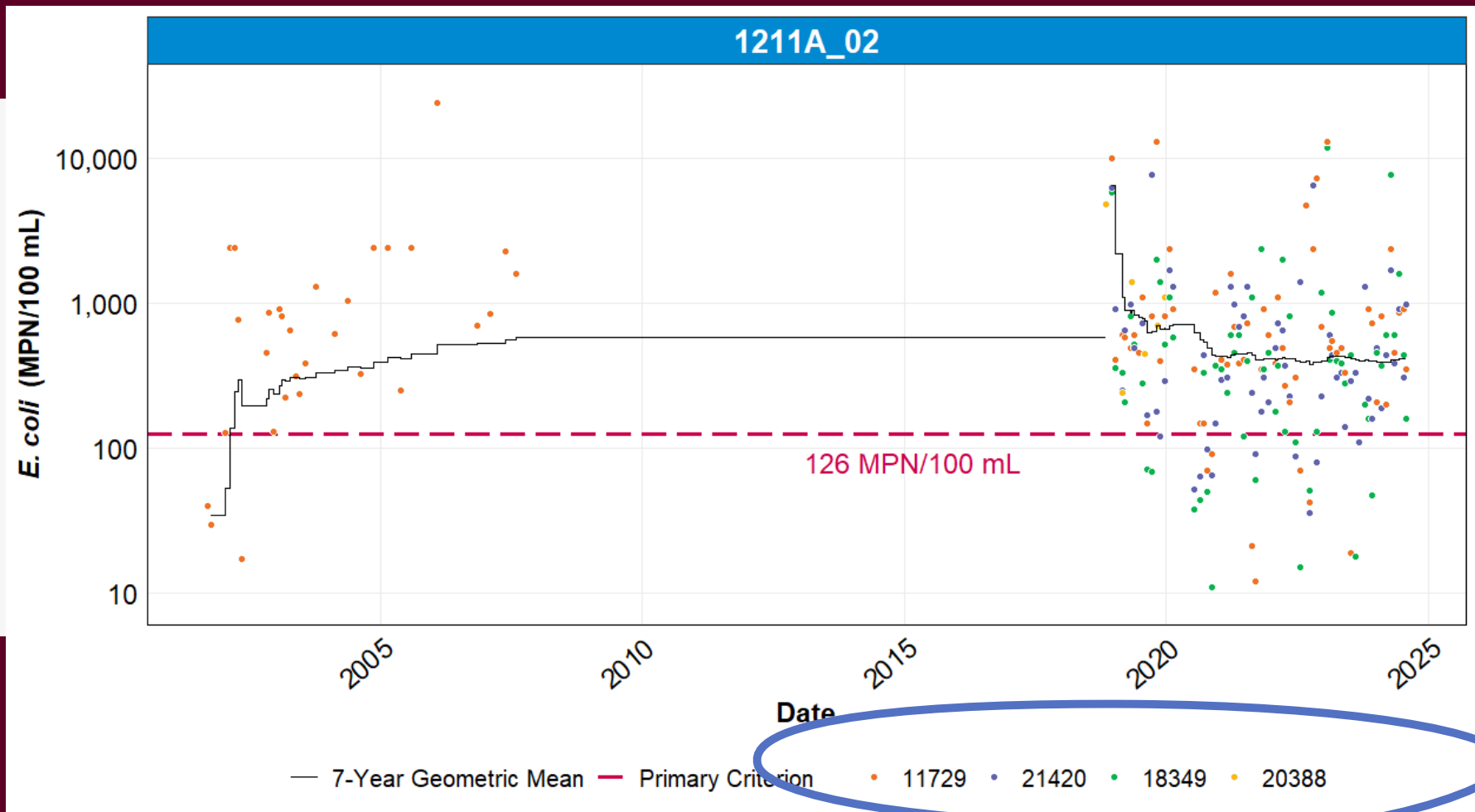
**We have collected our first set of samples for the new monitoring project!**



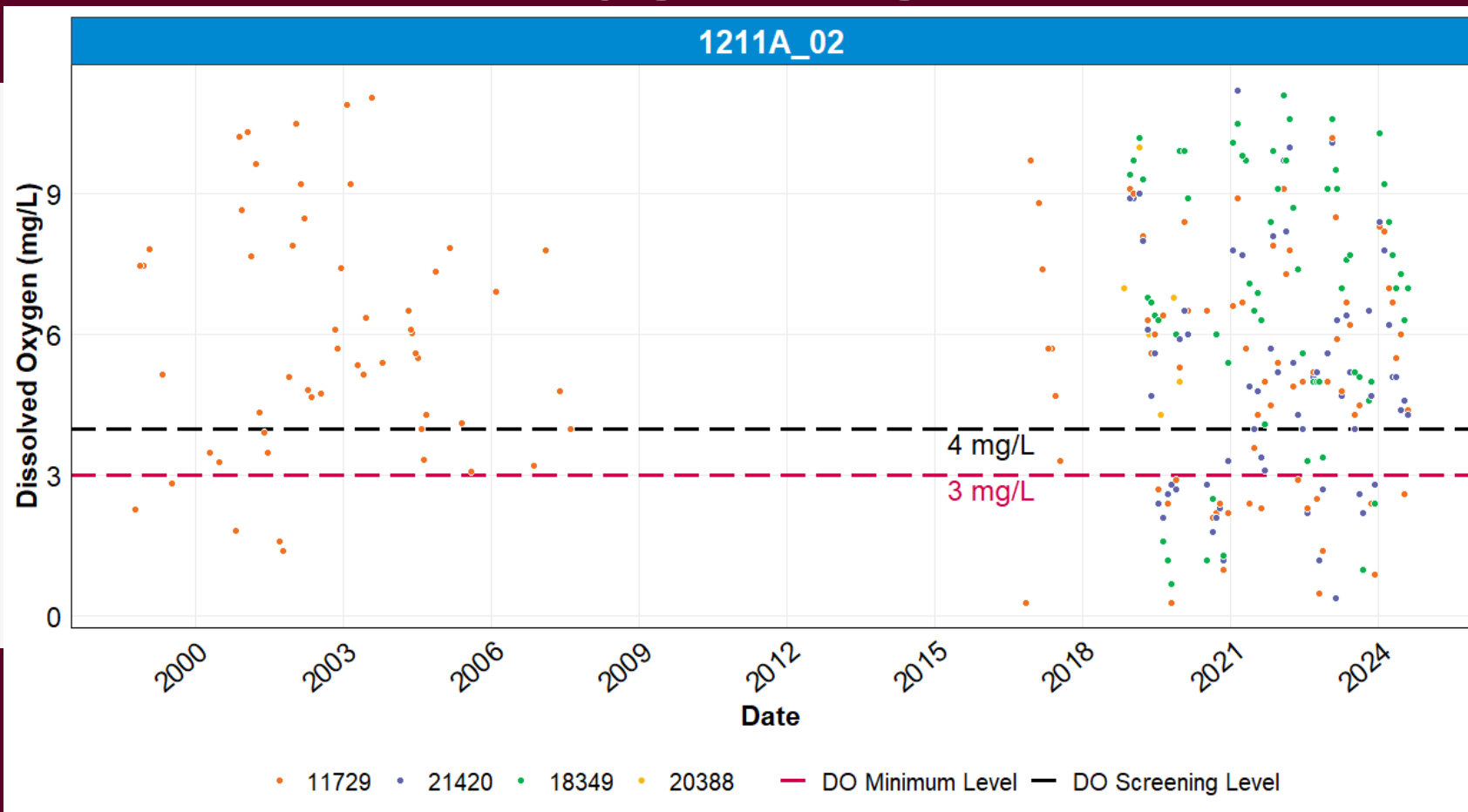




# Bacteria

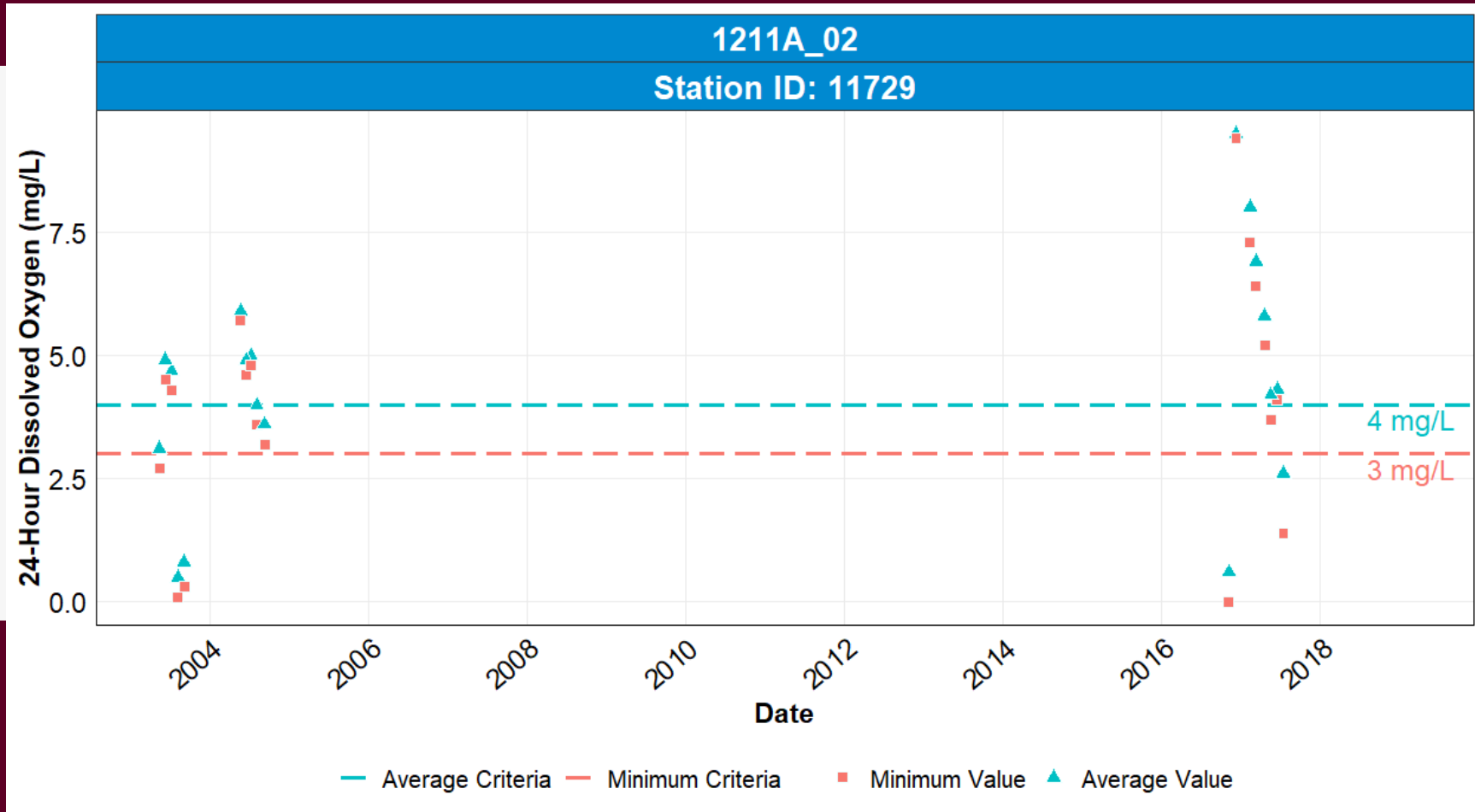


# Dissolved Oxygen – grab samples

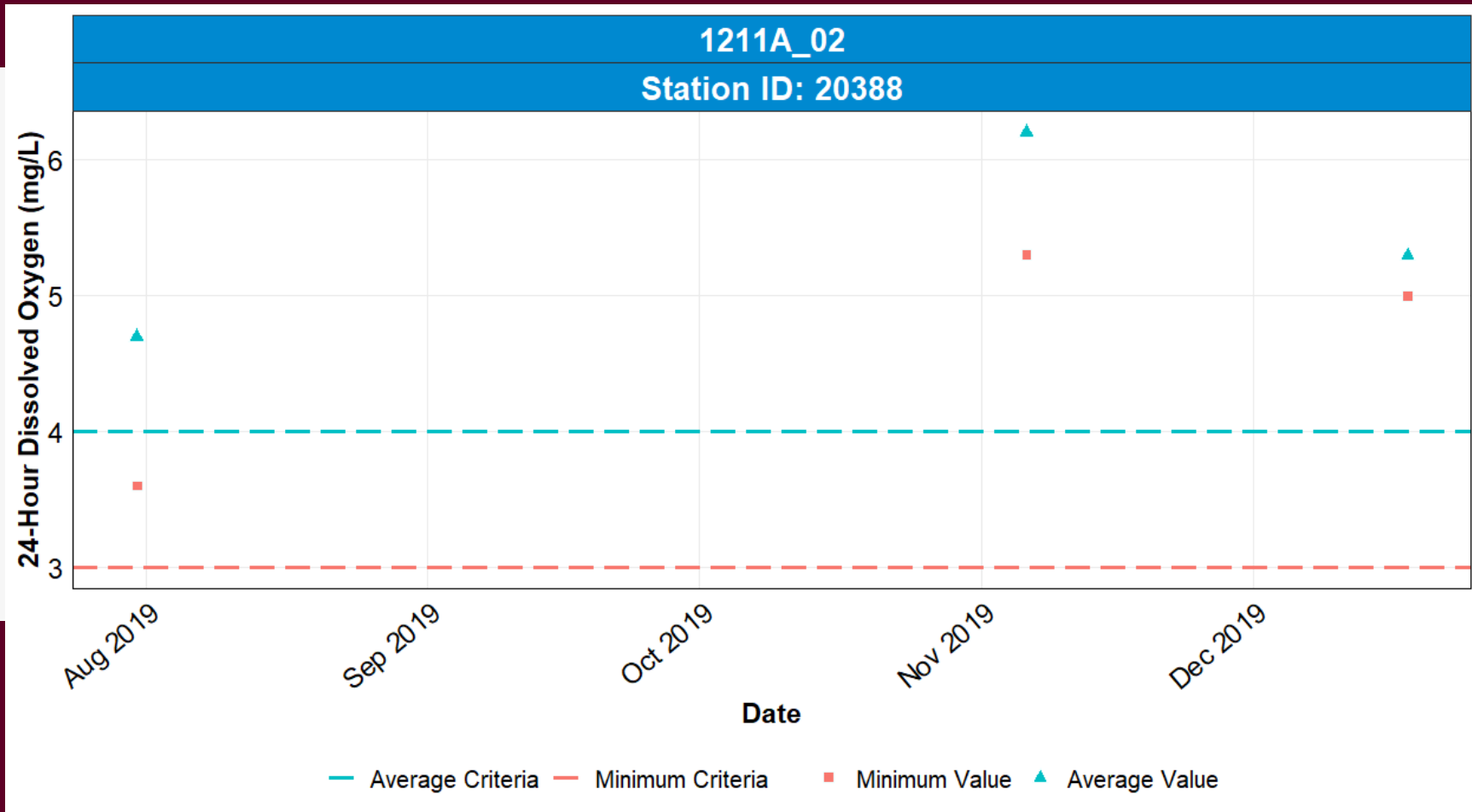




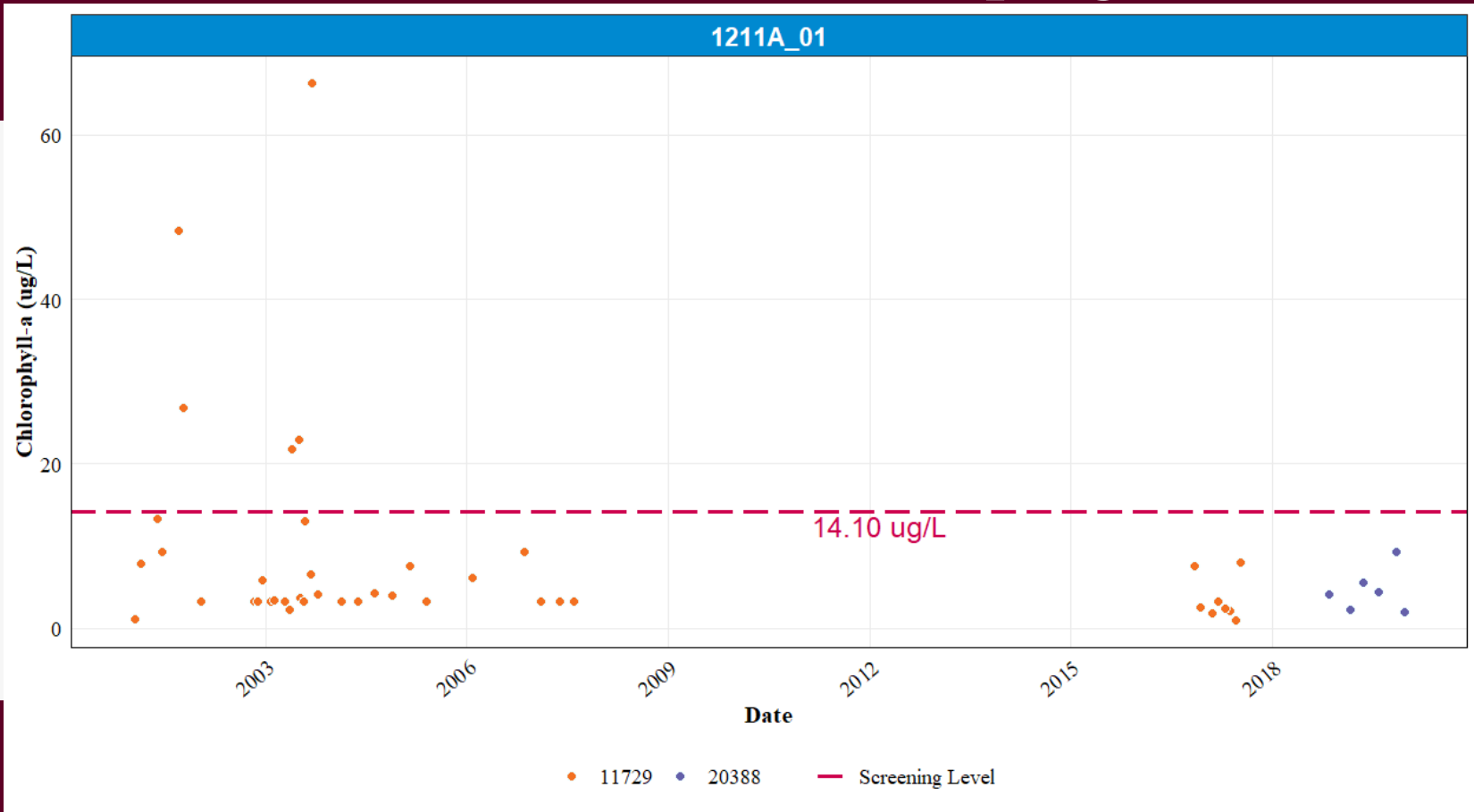
# Dissolved Oxygen – 24-hour sampling



# Dissolved Oxygen – diel sampling

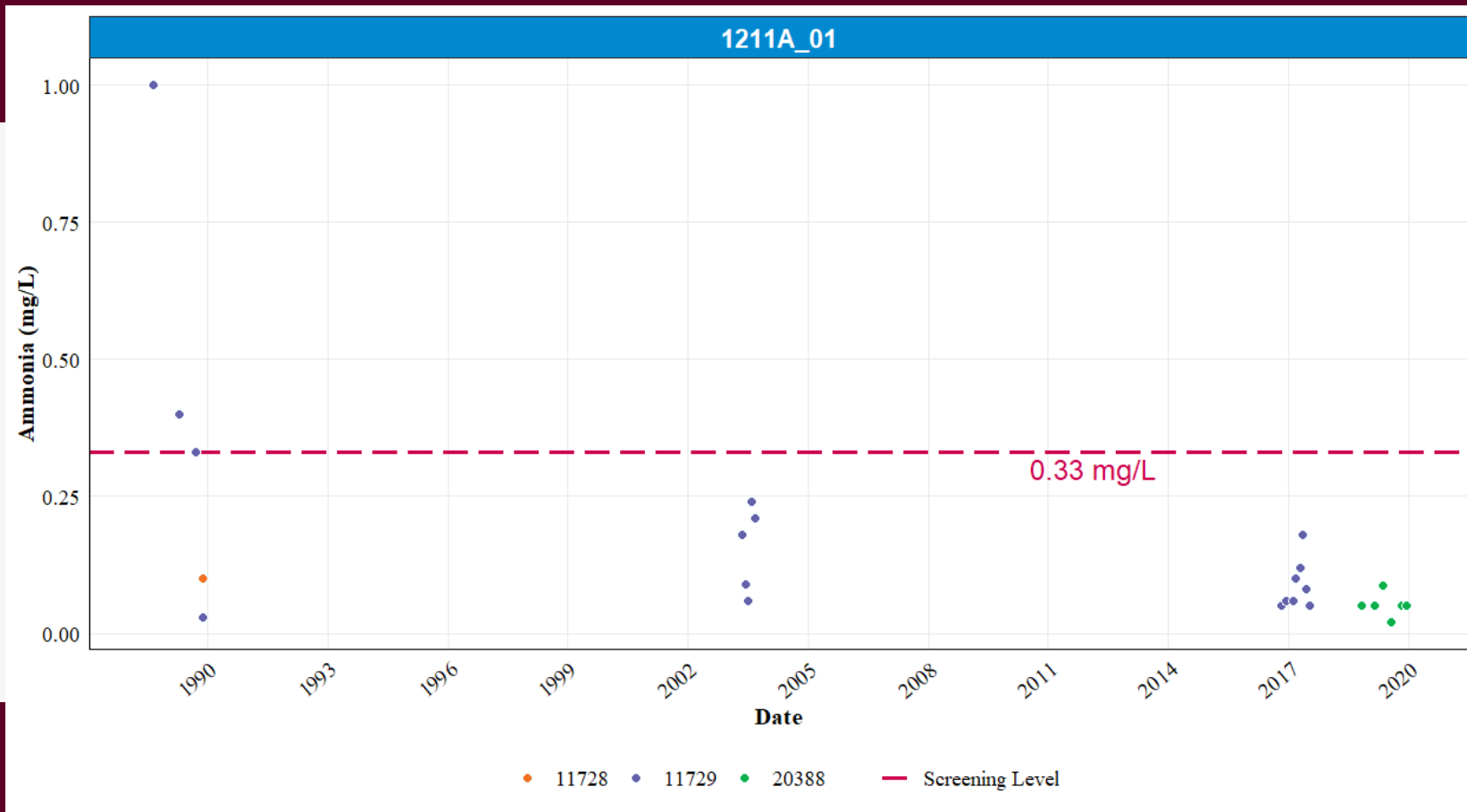


## Nutrients – Chlorophyll-a

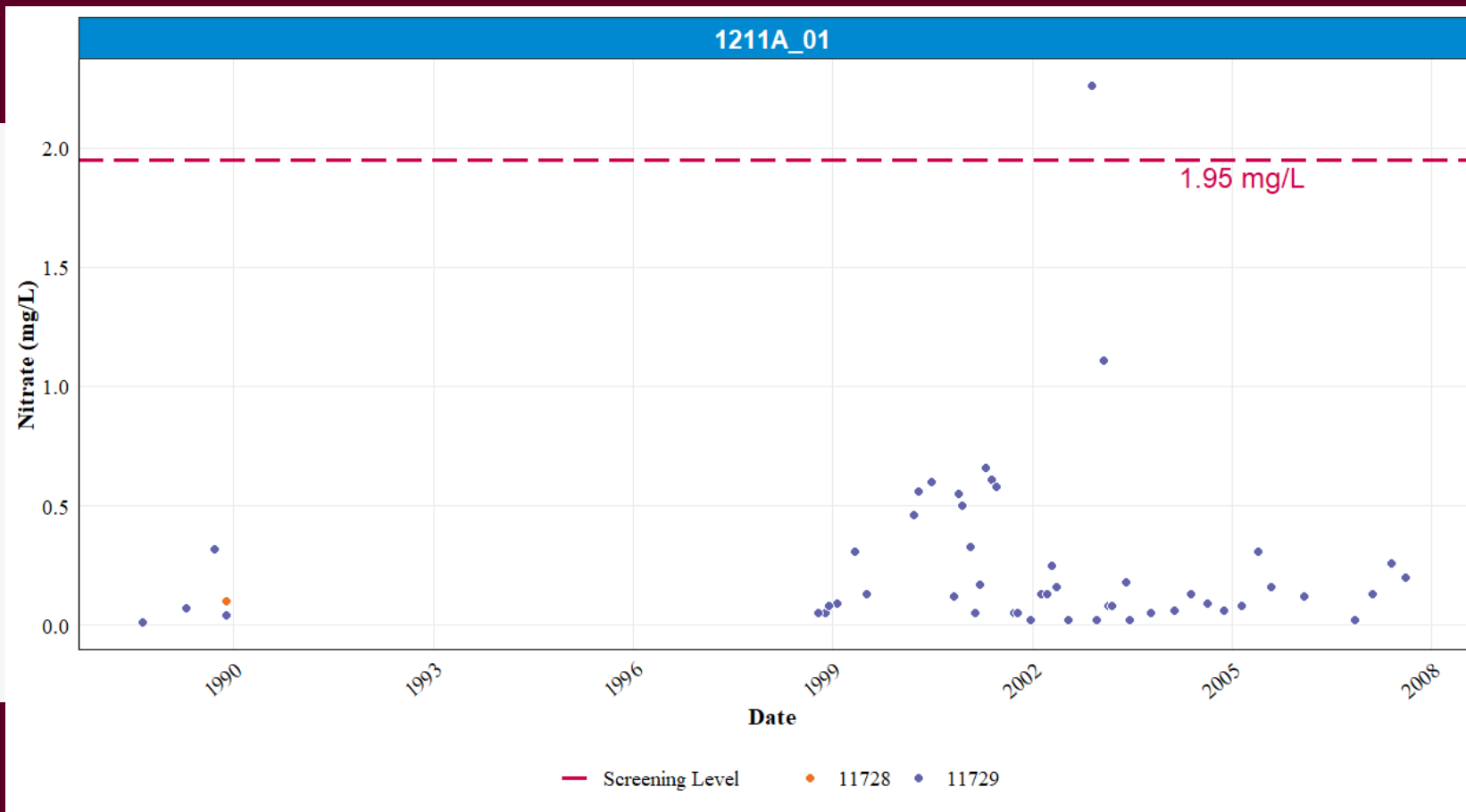




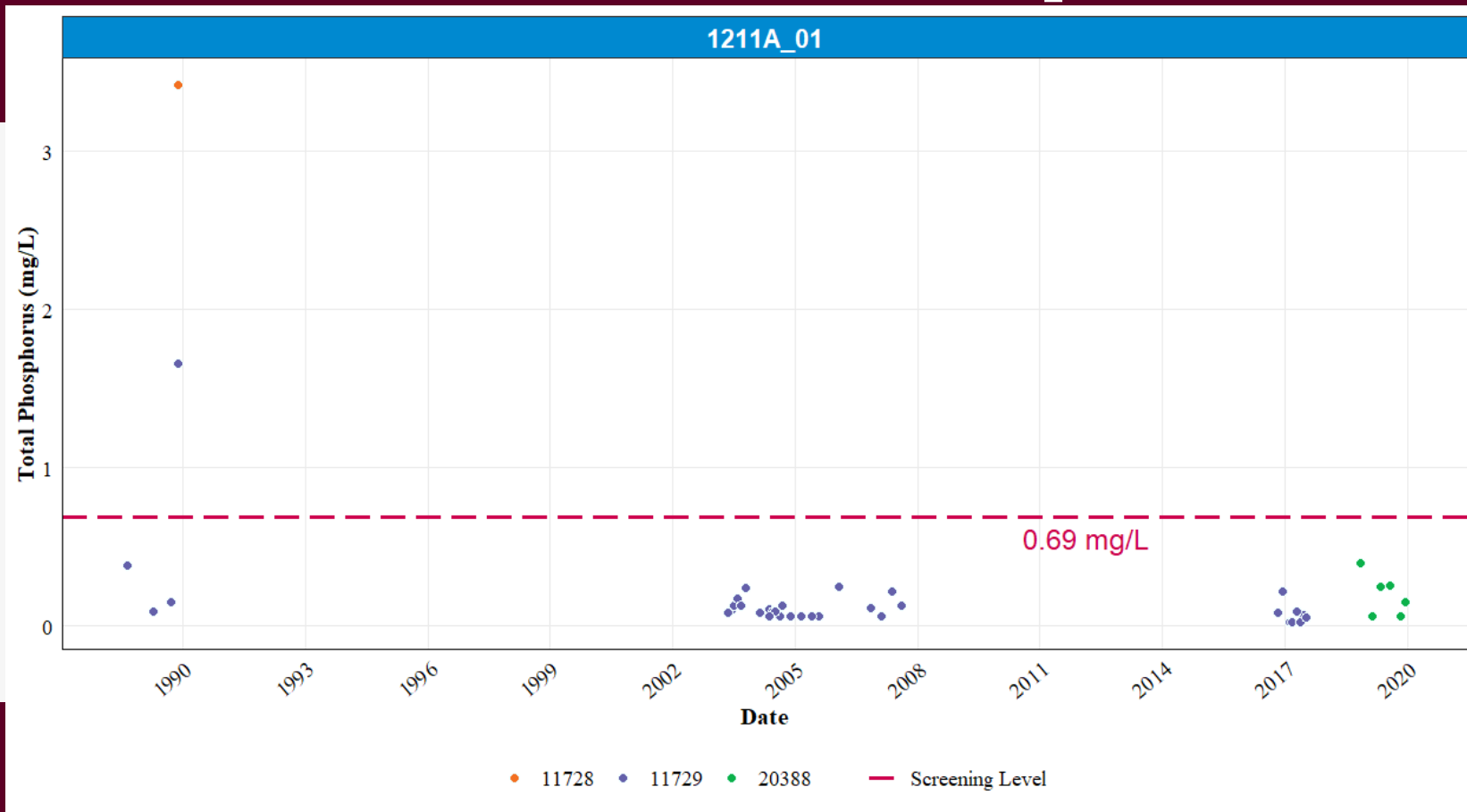
# Nutrients - Ammonia



# Nutrients - Nitrate

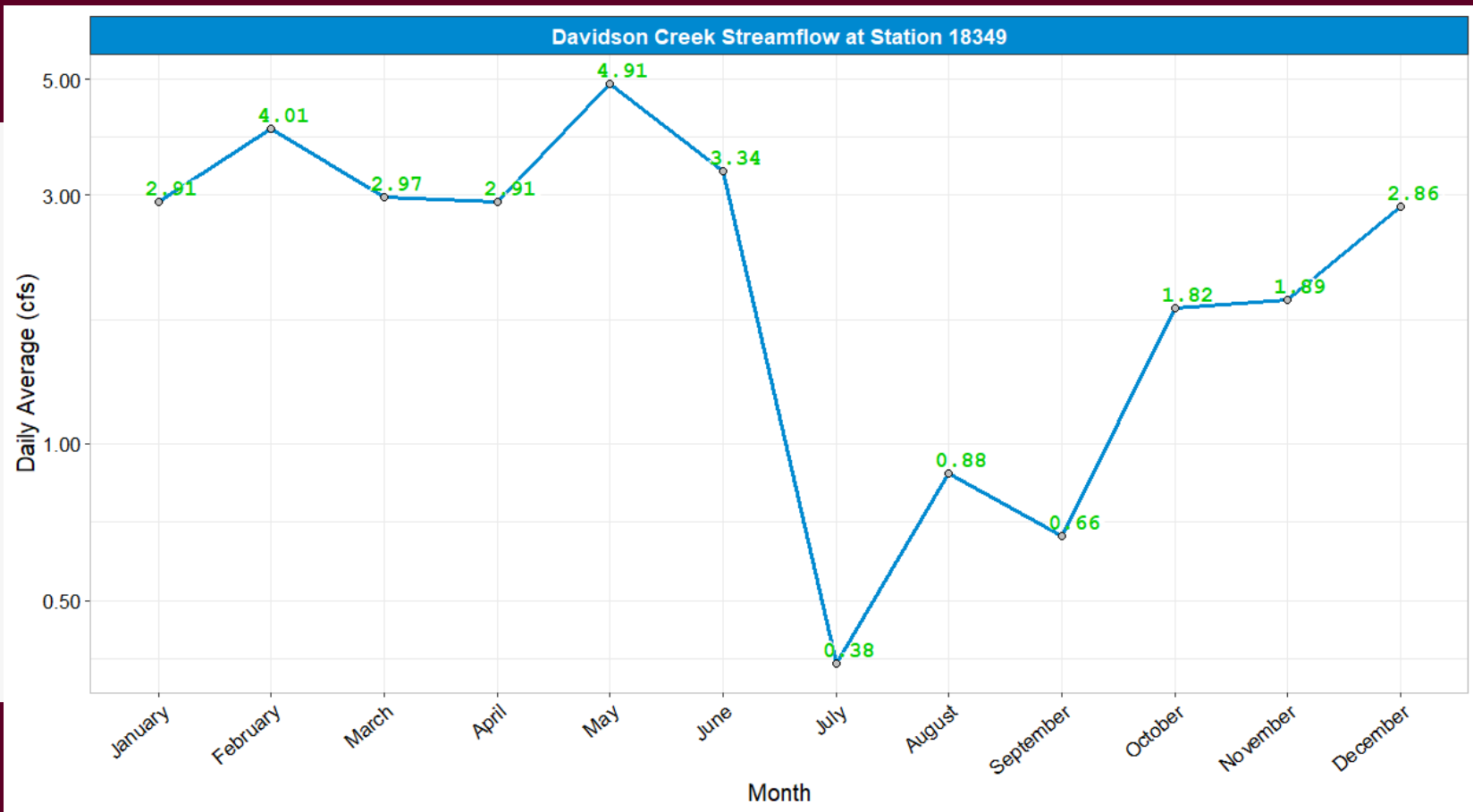


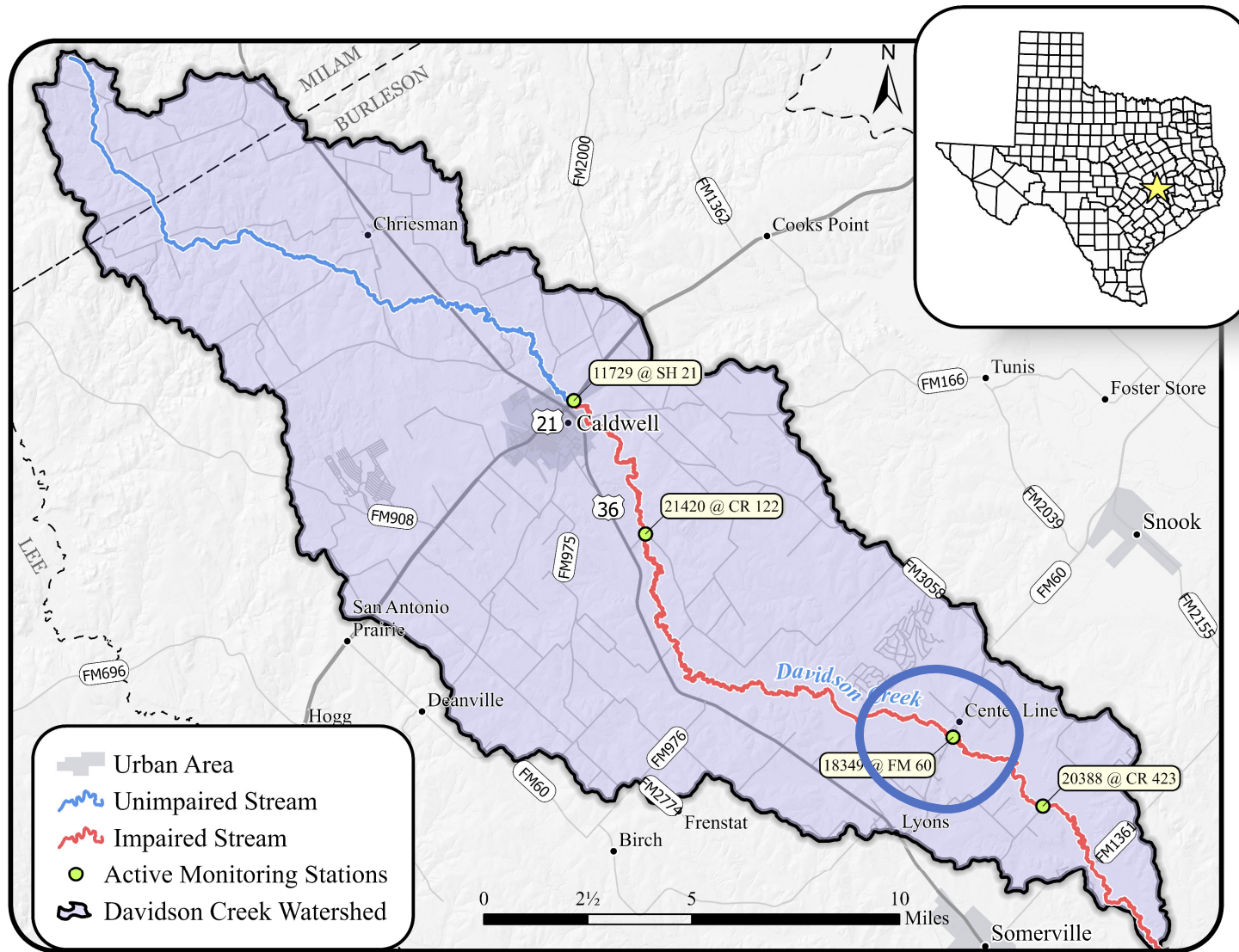
## Nutrients – Total Phosphorus



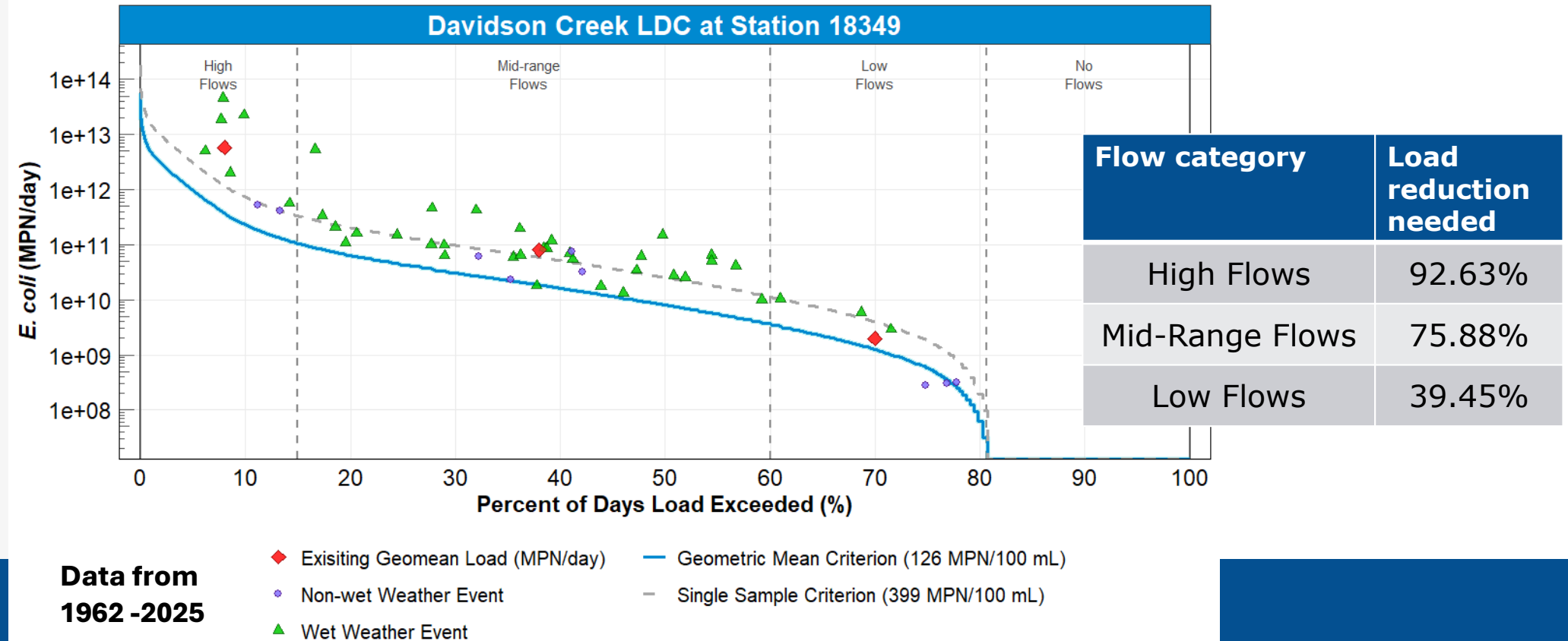


# Flow

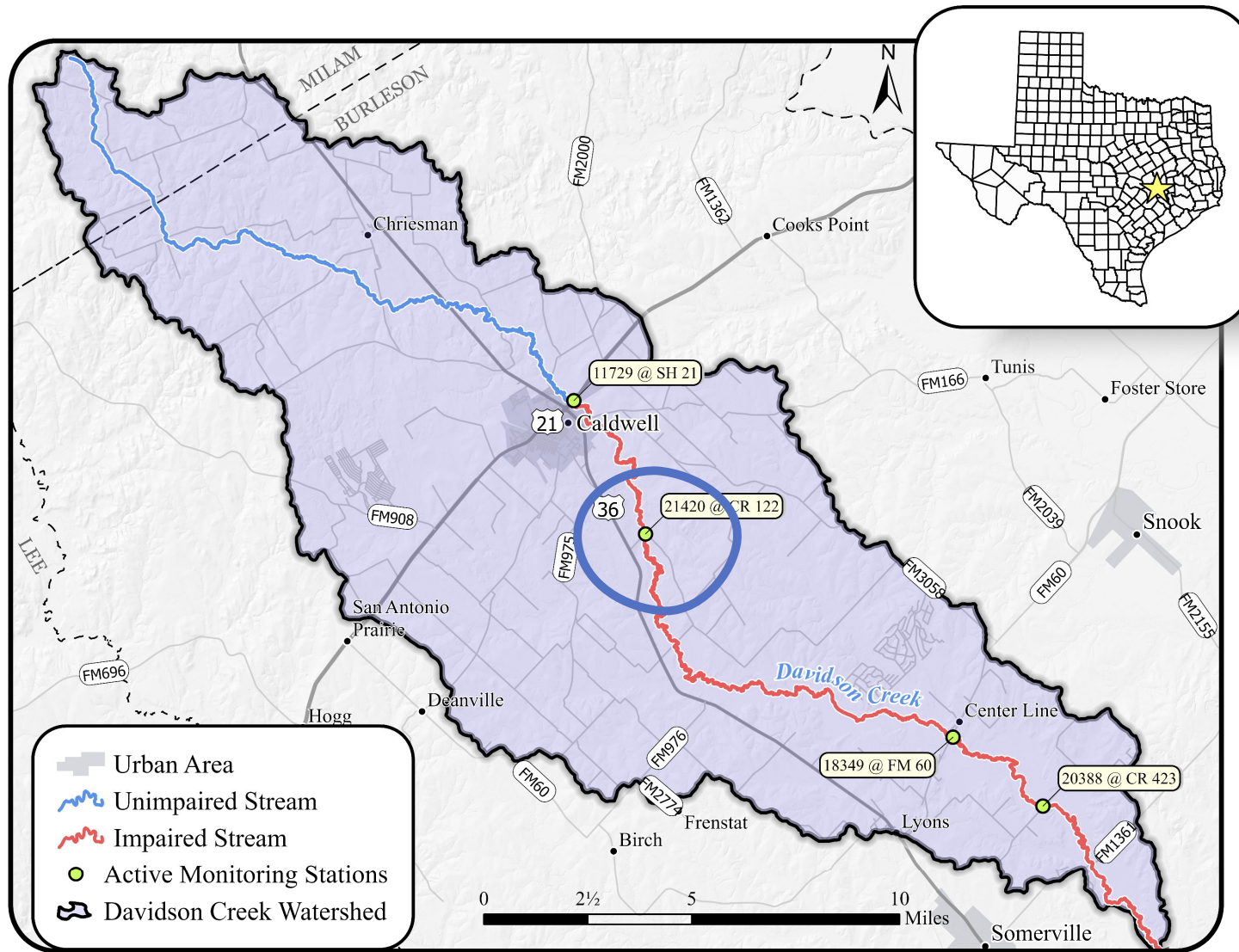




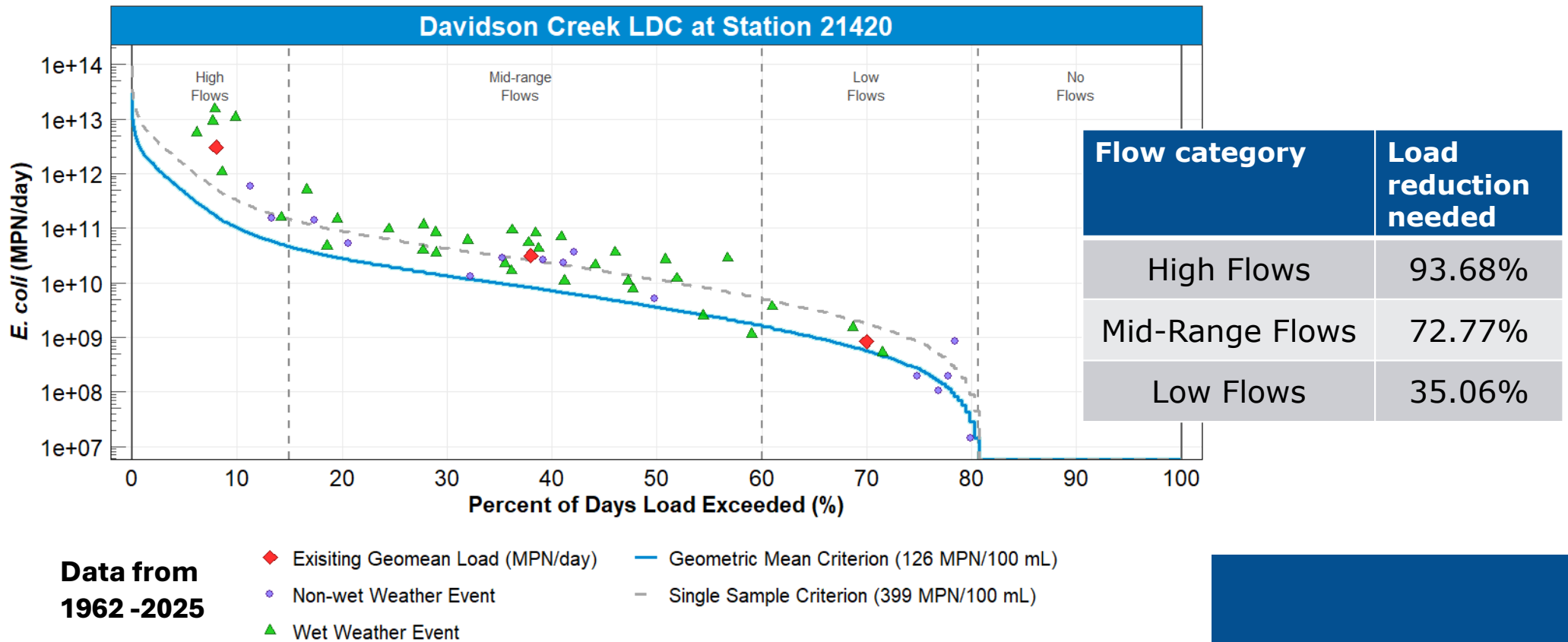
# Load Duration Curve

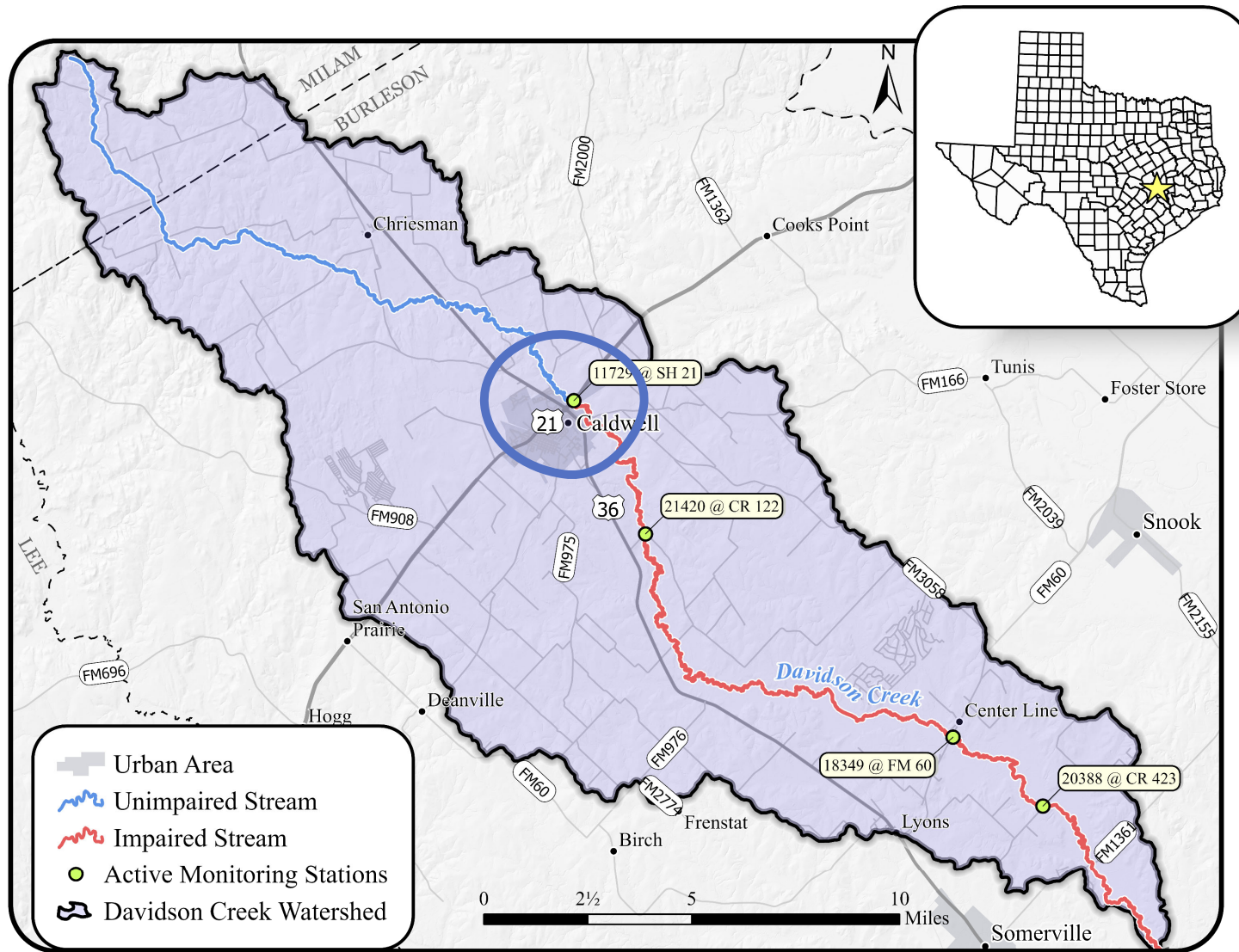




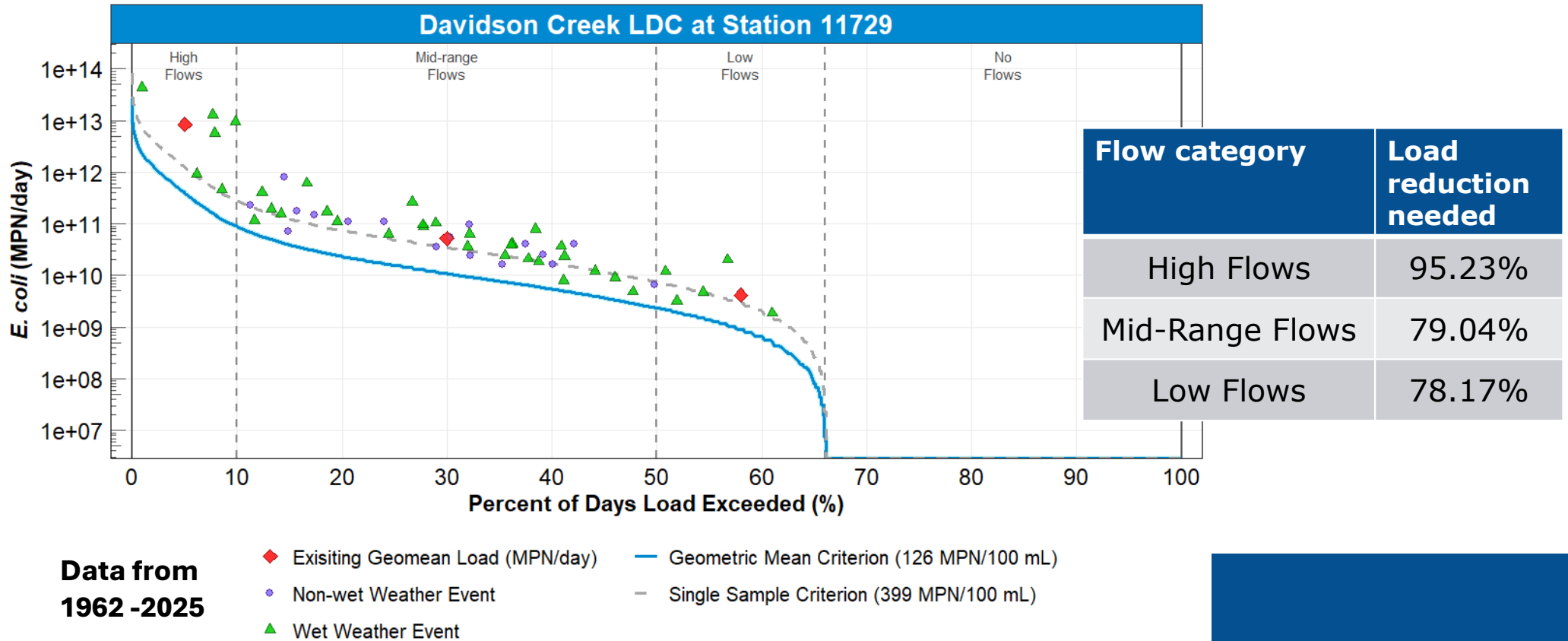


# Load Duration Curve





# Load Duration Curve





## Additional Meetings and Overall Timeline

- ☐ Next Stakeholder Meeting October 21
- ☐ Send out and post online meeting reminders and recap of previous meeting
- ☐ Will post chapters 1-4 for review and public comment
- ☐ Water Quality monitoring on Davidson Creek will continue

# Questions?

<https://davidson.twri.tamu.edu/>

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