

# North Cannon River WMO

## 2018 Water Monitoring Presentation



**Lindsey Albright**

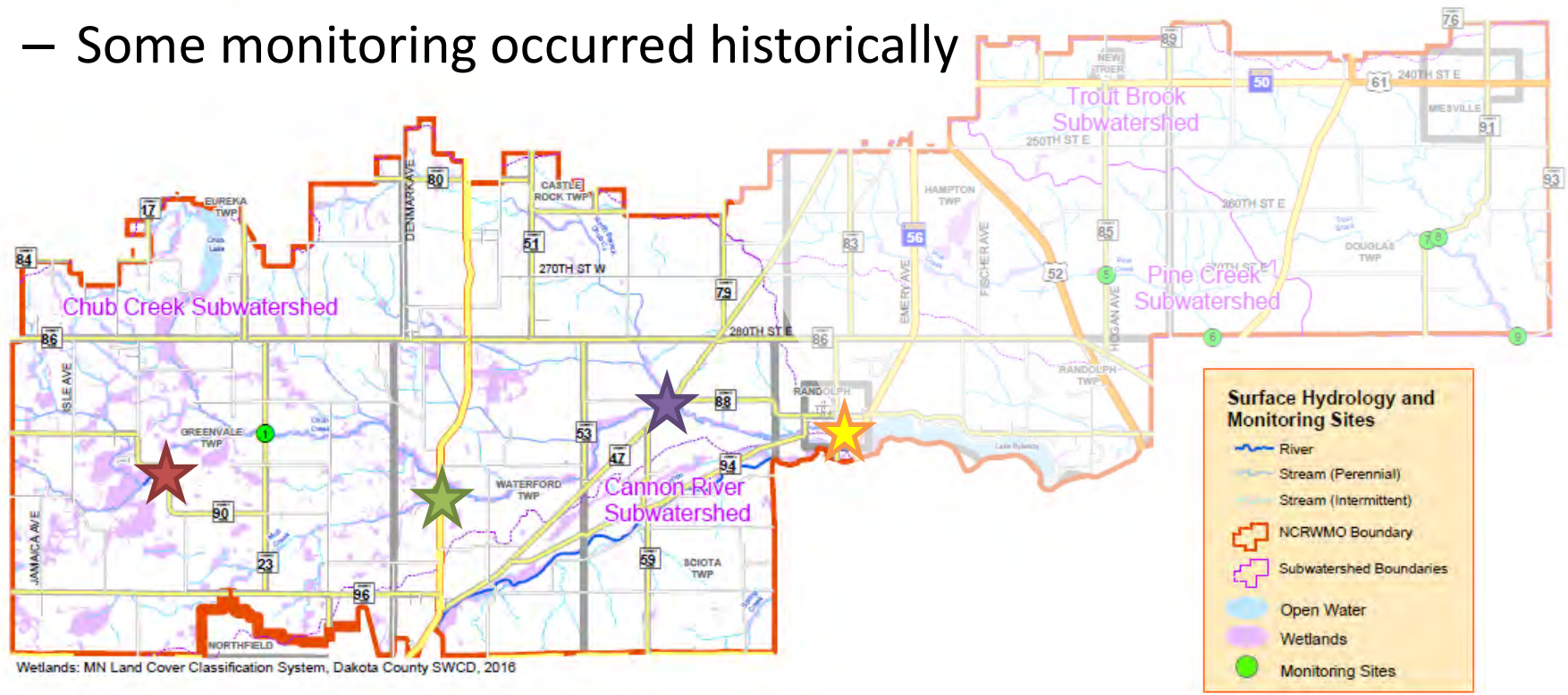
Water Resources Specialist

Dakota County Soil and Water Conservation District



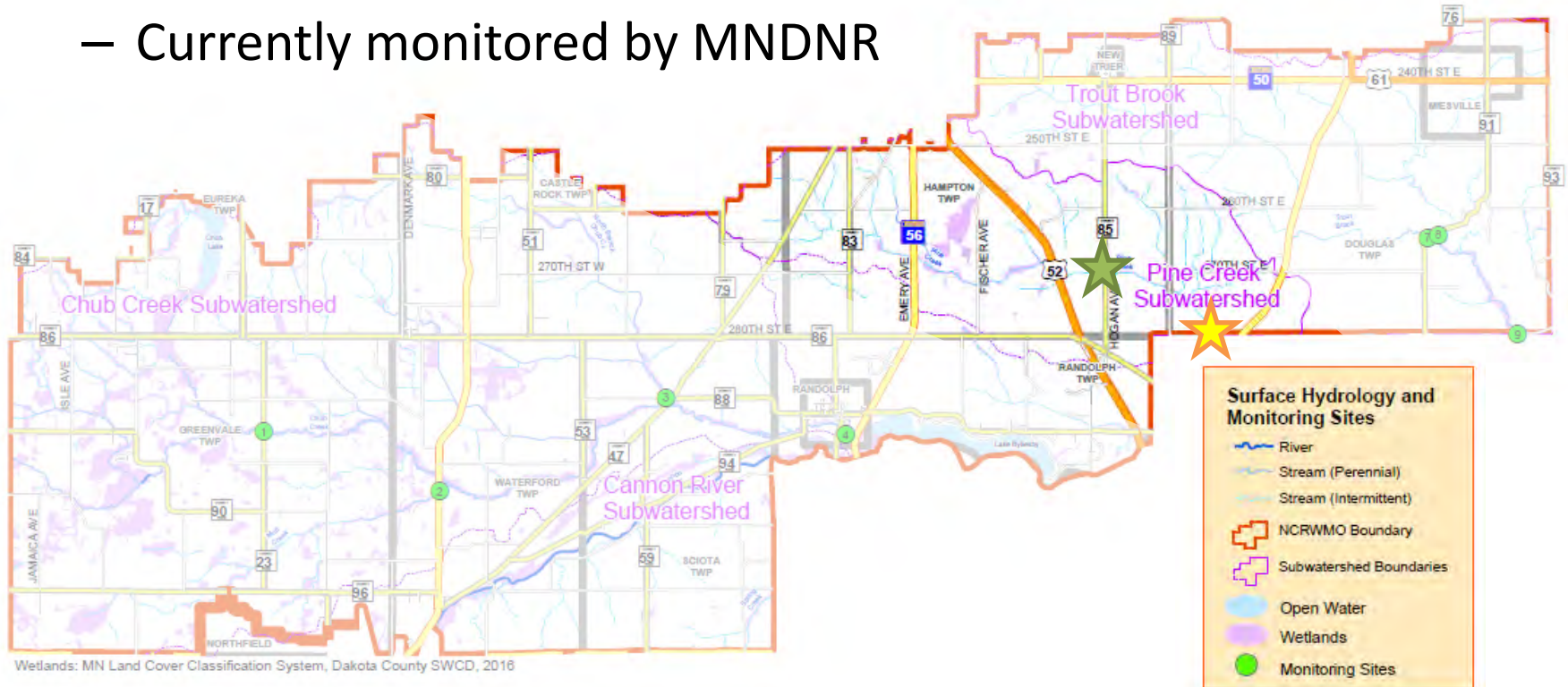
# Chub Creek Watershed

- Annual monitoring of Chub Creek PMS (★) site since 2011
- Dutch Creek (★), Mud Creek (★), N Br Chub Creek (★)
  - Monitoring began in July 2018
  - Some monitoring occurred historically



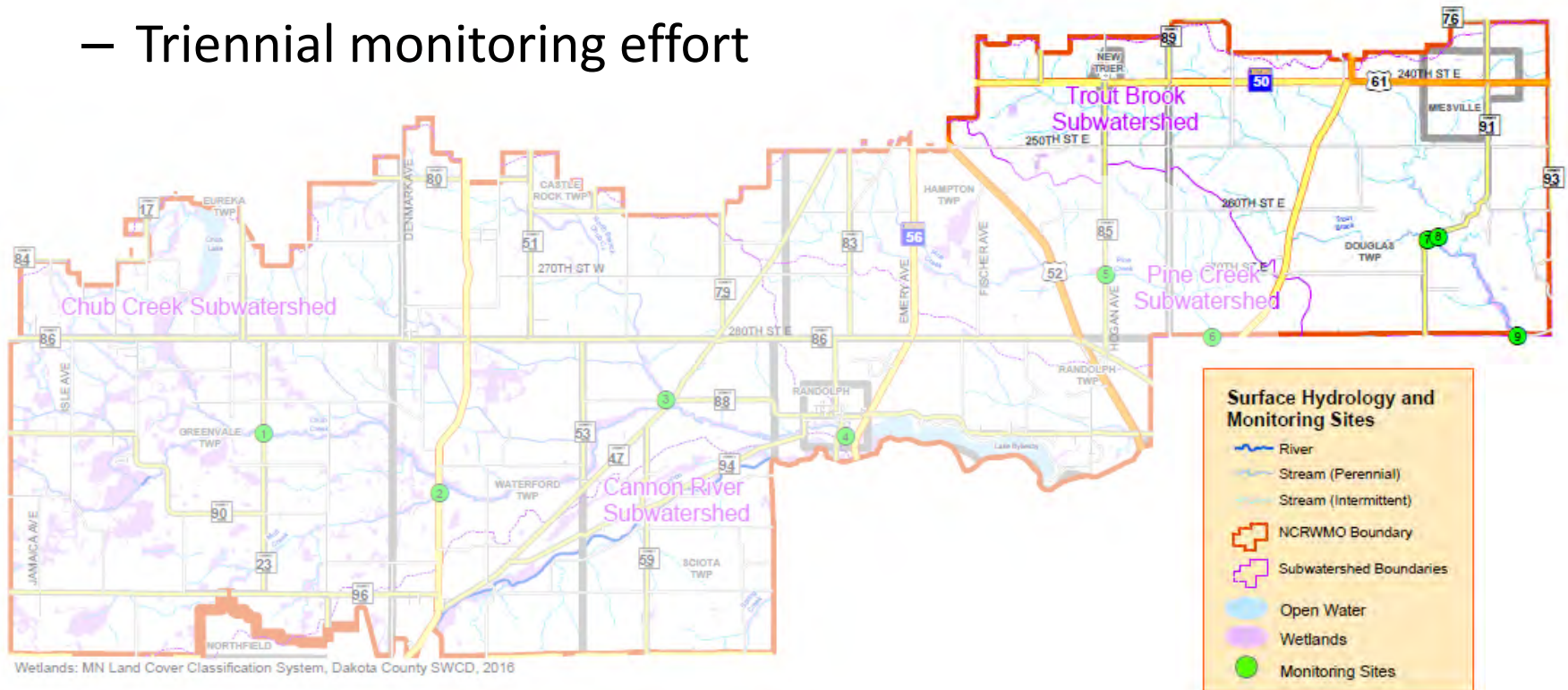
# Pine Creek Watershed

- Pine Creek at 280<sup>th</sup> St (★) – monitoring dates to 2006
- One historical site upstream
  - PC2 (★)
  - Currently monitored by MNDNR



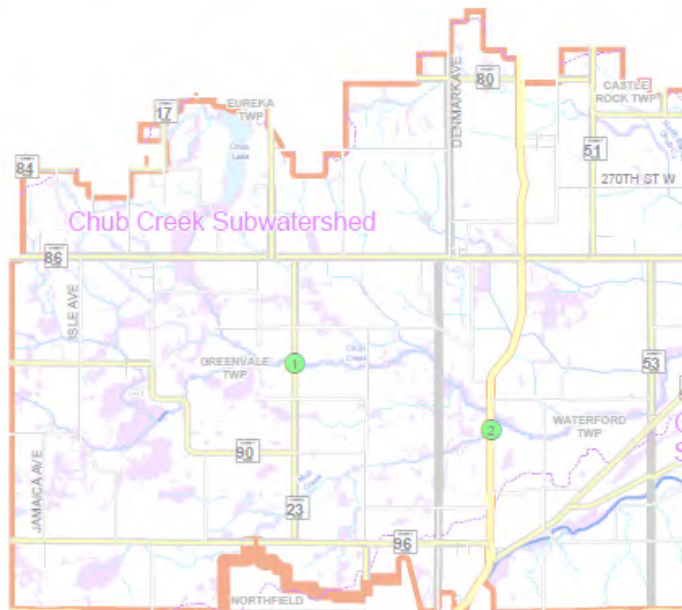
# Trout Brook Watershed

- Three surface water monitoring sites
  - Began in July 2018, last monitored in 2010
- Four sentinel springs – groundwater monitoring
  - Triennial monitoring effort

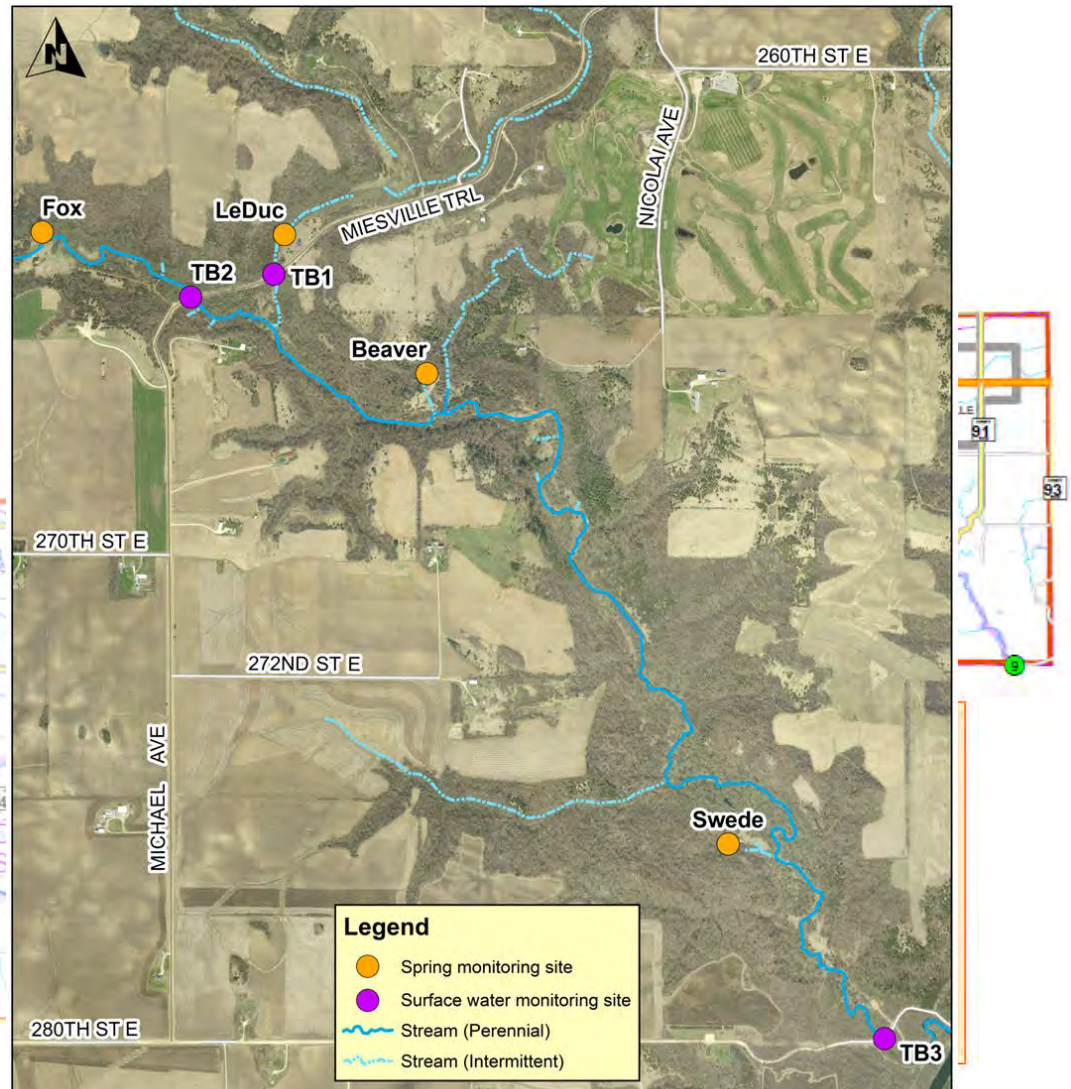


# Trout Brook Watershed

- Three surface water monitoring sites
- Four springs



Wetlands: MN Land Cover Classification System, Dakota County SWCD, 2016



# Water Quality Impairments

## *Chub Creek*

- Aquatic Macroinvertebrates Bioassessments (2014)
- Fishes Bioassessments (2014)
- Fecal Coliform (1994, 2006)

## *Mud Creek*

- Fecal Coliform (2006)

## *Pine Creek*

- Nitrates (2010)

## *Trout Brook*

- Turbidity (2006)
- Nitrates (2010)
- Aquatic Macroinvertebrate Bioassessments (2014)
- Nitrates (2018)

## *Dutch Creek*

- Aquatic Macroinvertebrates Bioassessments (2016)
- Fishes Bioassessments (2016)

# 2018 Monitoring Activities

- Water quality sampling
  - Chub Creek – April until October
  - Dutch Creek, Mud Creek, North Branch Chub Creek – July through October
  - Pine Creek – July through October
  - Trout Brook – July through October
- Flow measurements at Chub Creek
- Water level/temp logger deployed at Chub Creek
- Groundwater monitoring in Trout Brook
  - Quarterlyish – February, July, October

\*\*New in 2018

# Water Quality Overview

- pH levels and water temperature are typical
- Dissolved oxygen levels exceed (good) standard
  - Low at Dutch Creek
- Conductivity high in Trout Brook watershed
- Transparency varies due to runoff events
- Phosphorus high in Chub Creek watershed
  - Elevated levels following runoff events
- Total suspended solids very low
- *E. coli* levels continue to be high
- Nitrate problematic in North Branch Chub Creek, Pine Creek, and throughout Trout Brook



# Sampling Equipment

Secchi tube



Weighted bucket



Tapedown

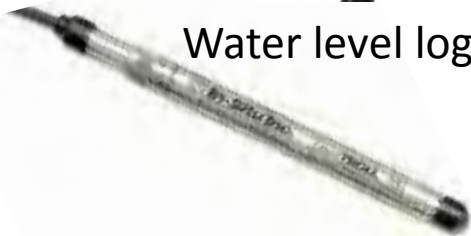


FlowTracker

Multi-parameter sonde



Water level logger



Waders



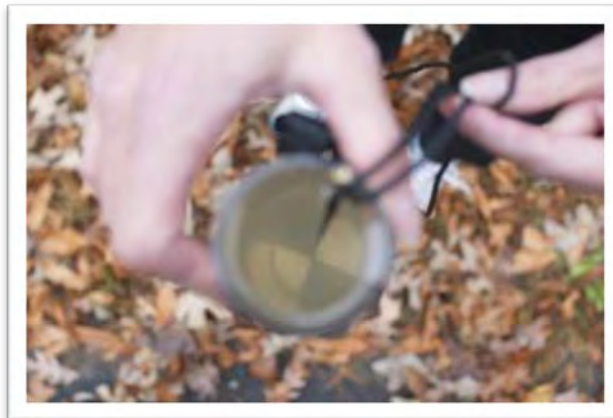
Field camera



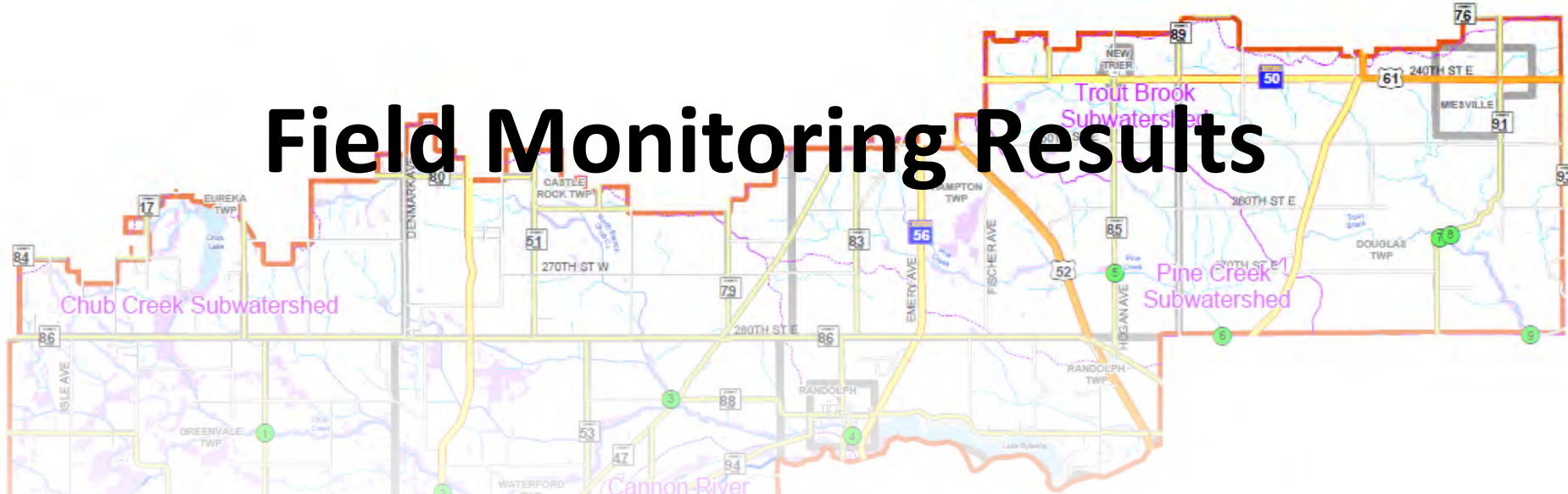
Safety vest














# Field Monitoring

- Water temperature
- Dissolved Oxygen
- pH
- Transparency
- Conductivity



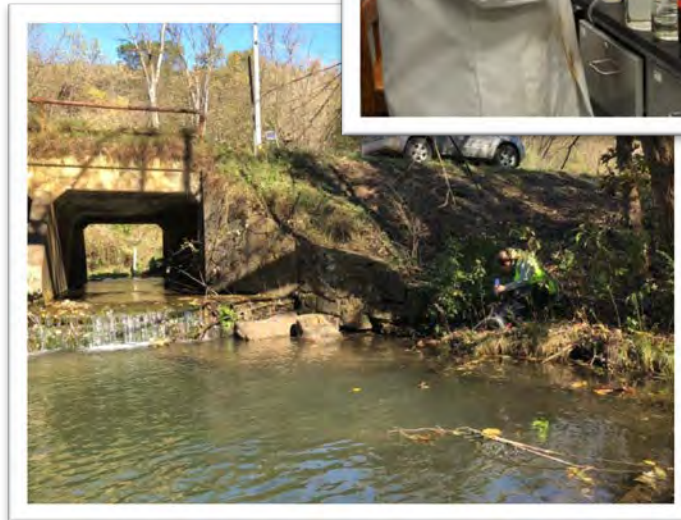
# Field Monitoring Results



Parameter	Desired range	Chub	Pine	Trout
Temperature (°C)	Less than 30			
Dissolved Oxygen (mg/L)	Greater than 5.0	Dutch300		
pH (S.U.)	6.5 to 9.0			
Transparency (cm)	Greater than 25			
Conductivity (µS/cm)	Less than 698			TB2

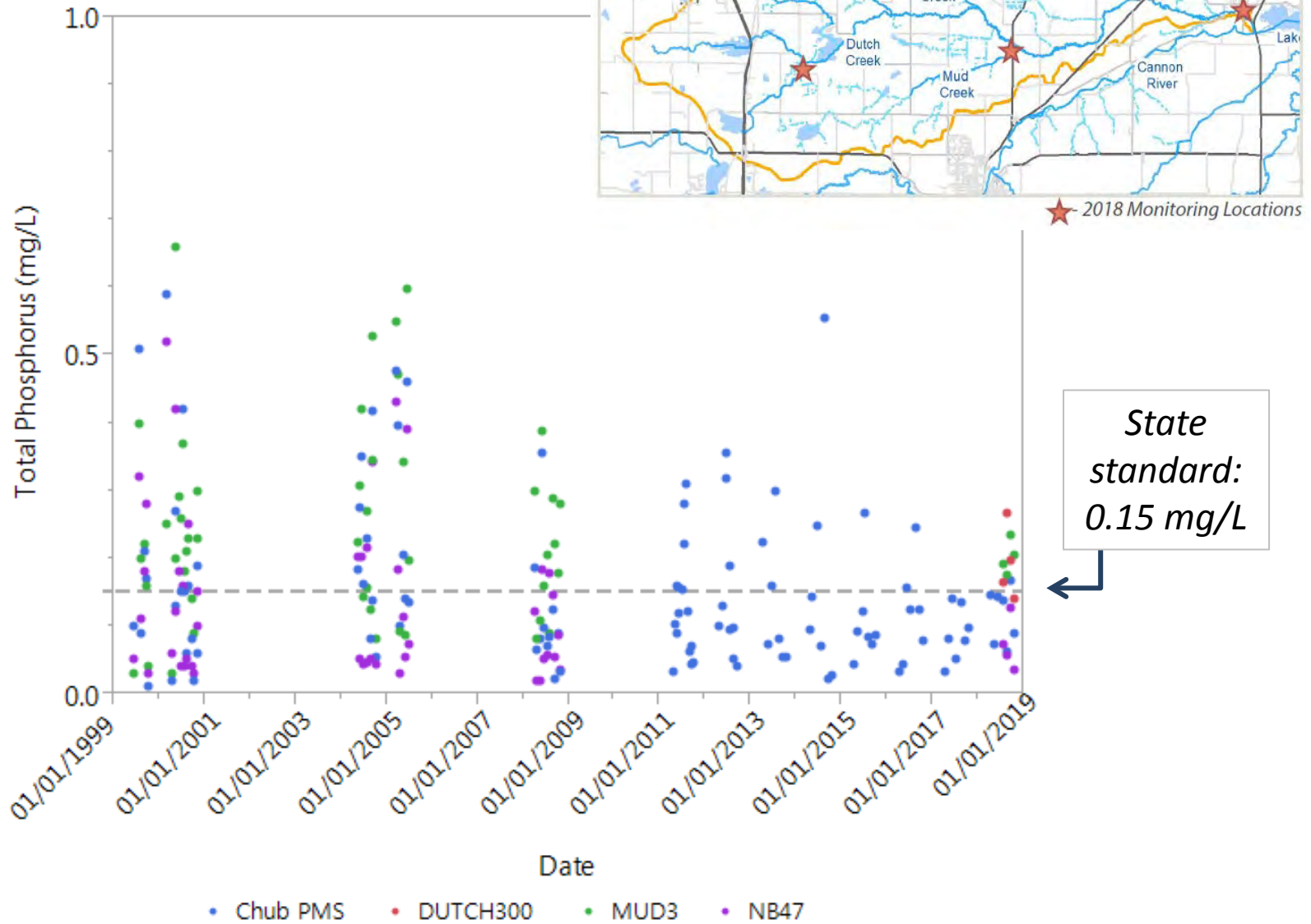
# Lab Analyses

- Total Phosphorus
- Total Suspended Solids
- *E. coli* Bacteria
- Nitrogen
  - Nitrate



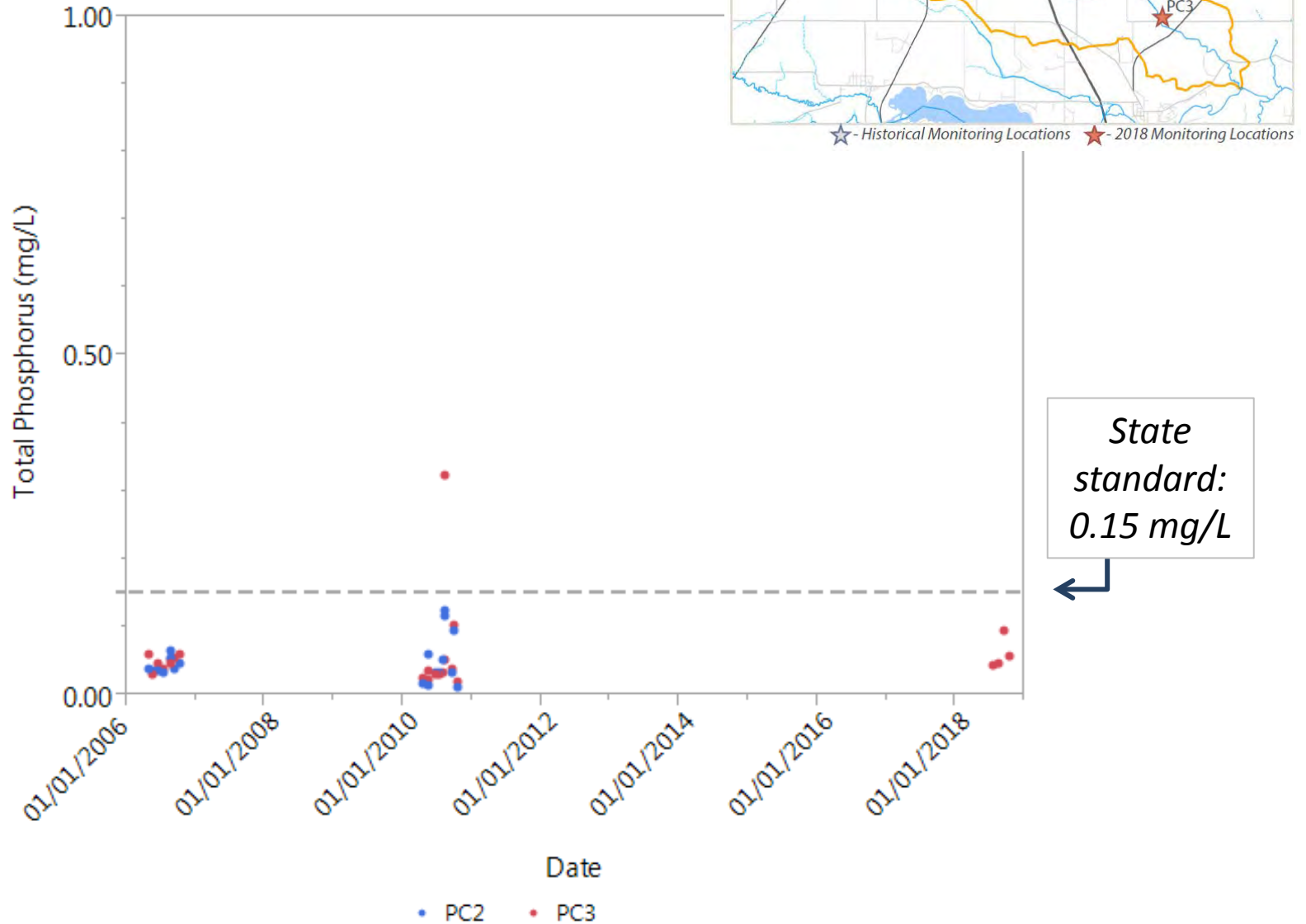
# Total Phosphorus

## Chub Creek



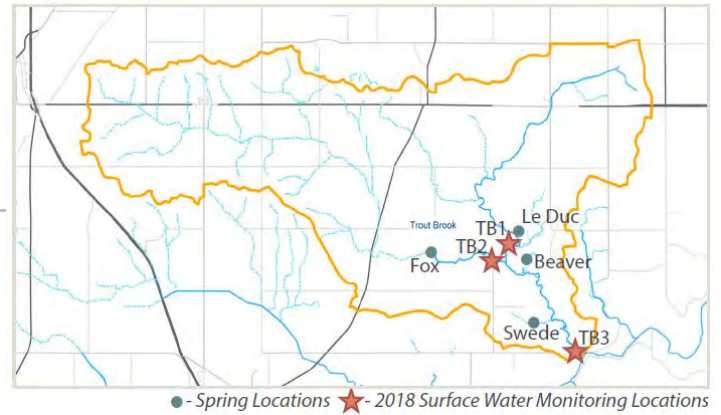
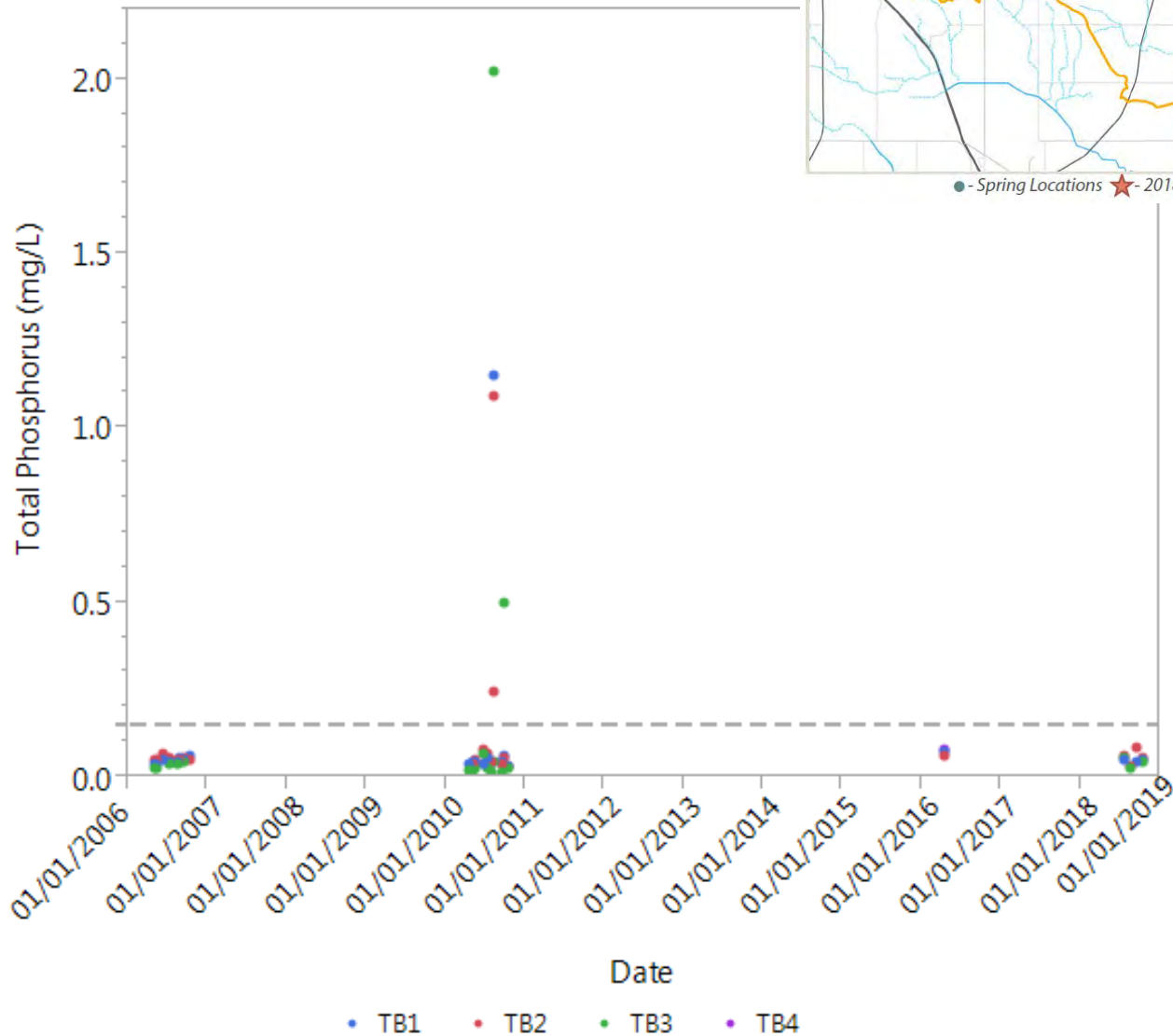
# Total Phosphorus

## Pine Creek



# Total Phosphorus

## Trout Brook

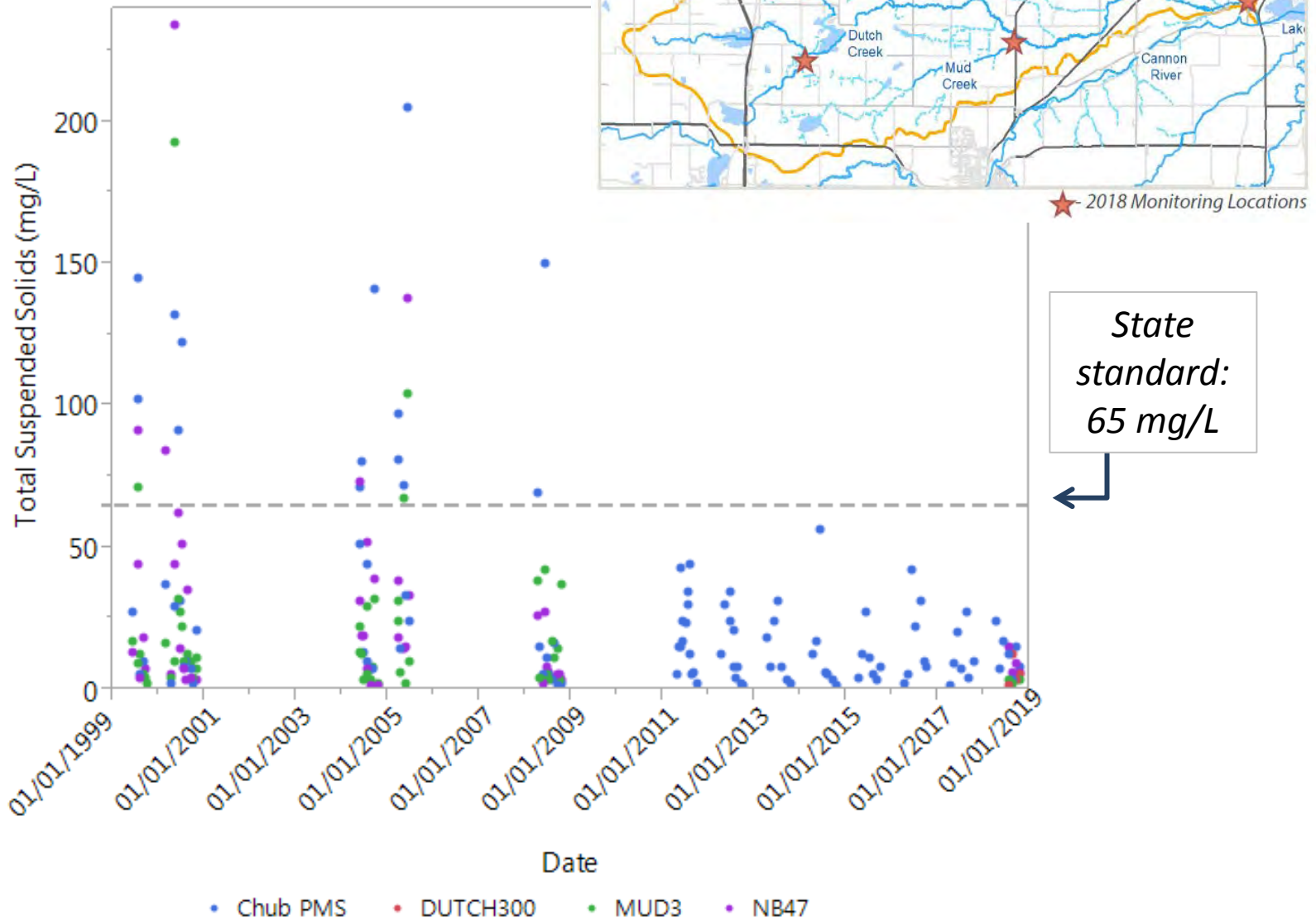


State  
standard:  
0.15 mg/L



# Total Suspended Solids

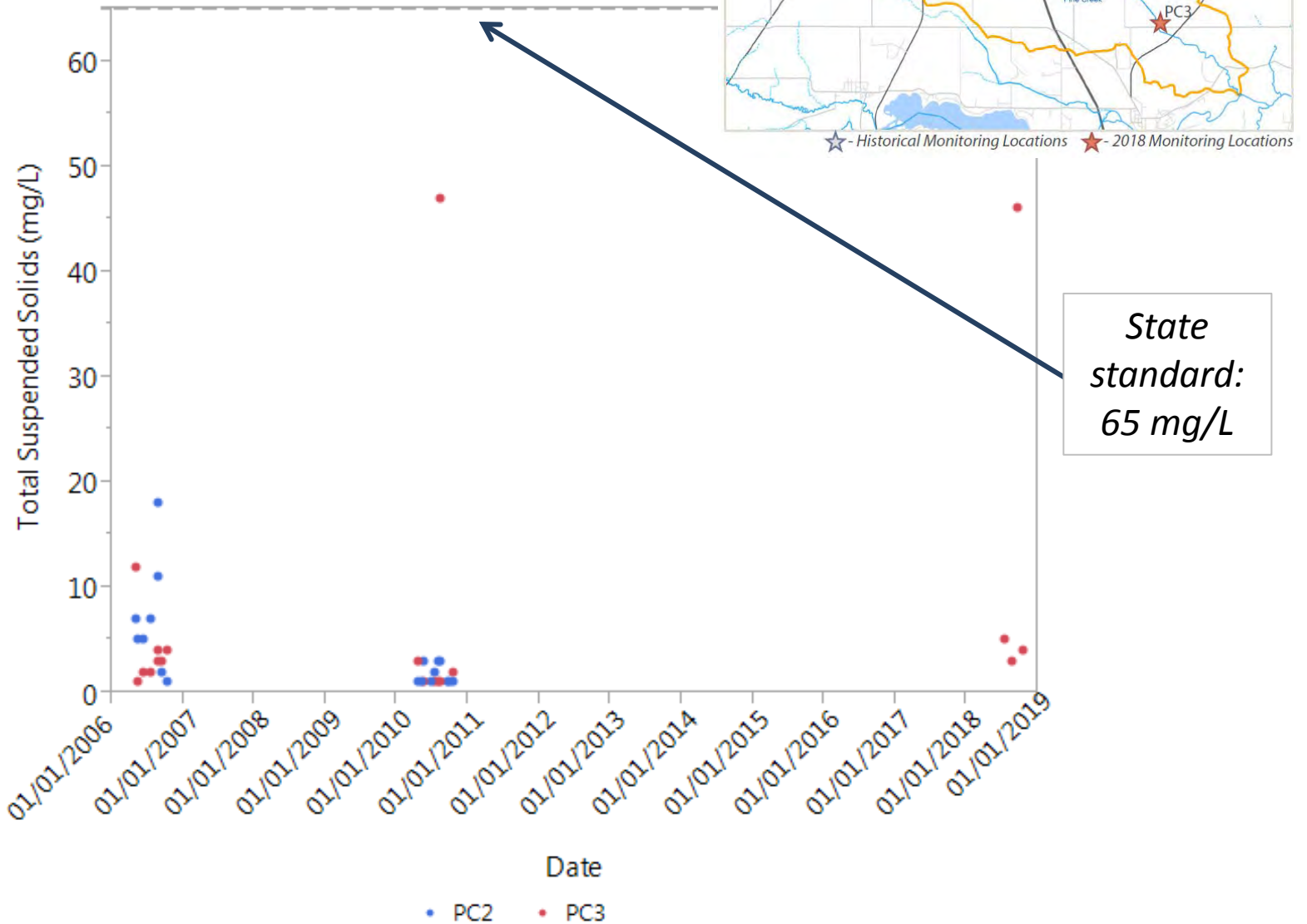
## Chub Creek





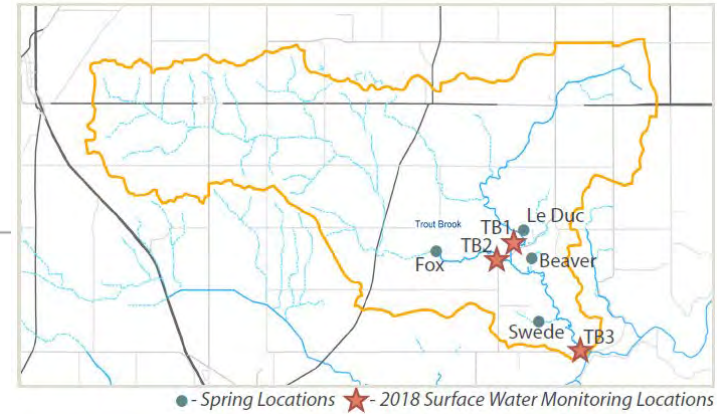
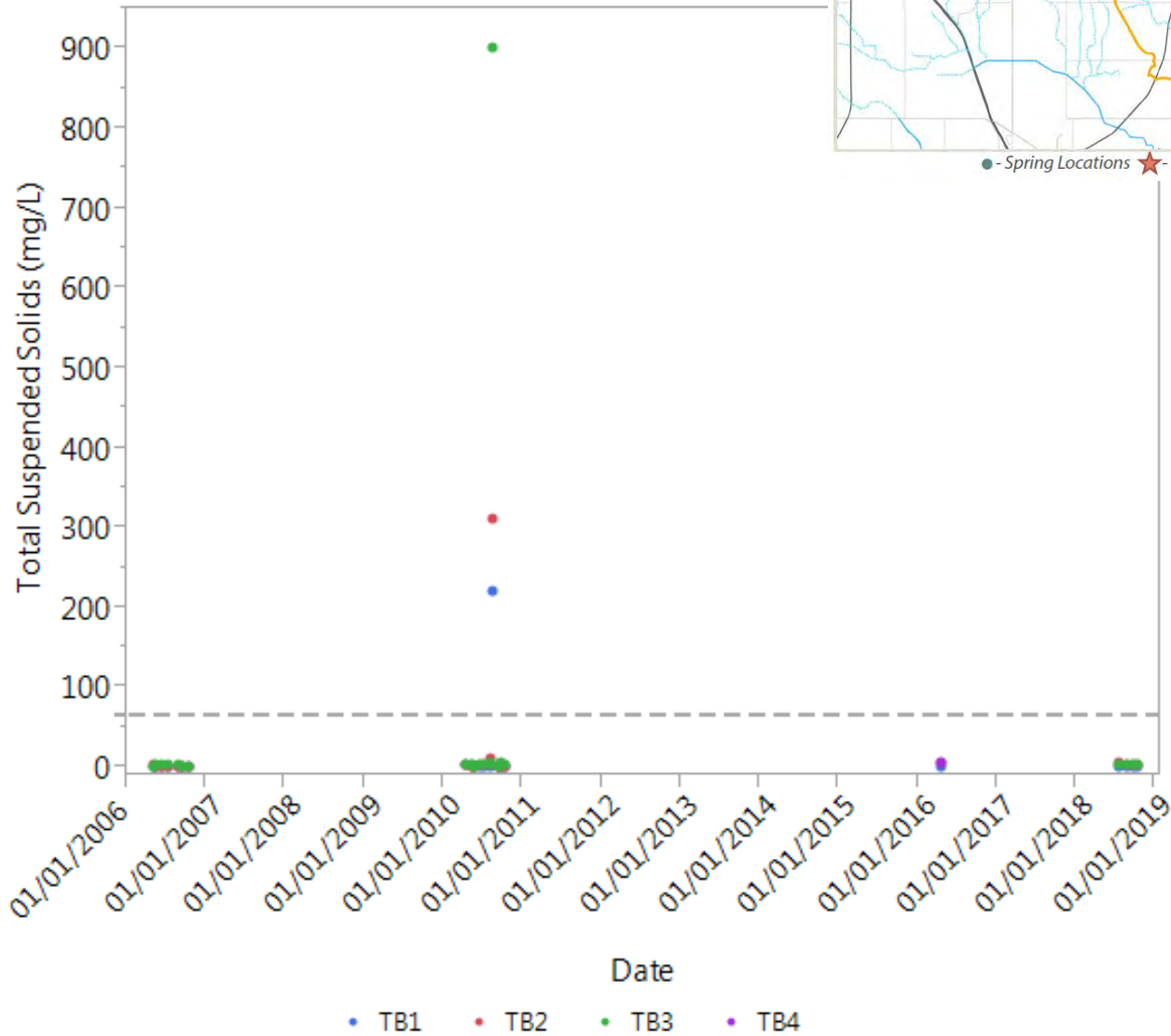
# Total Suspended Solids

## Pine Creek



# Total Suspended Solids

## Trout Brook



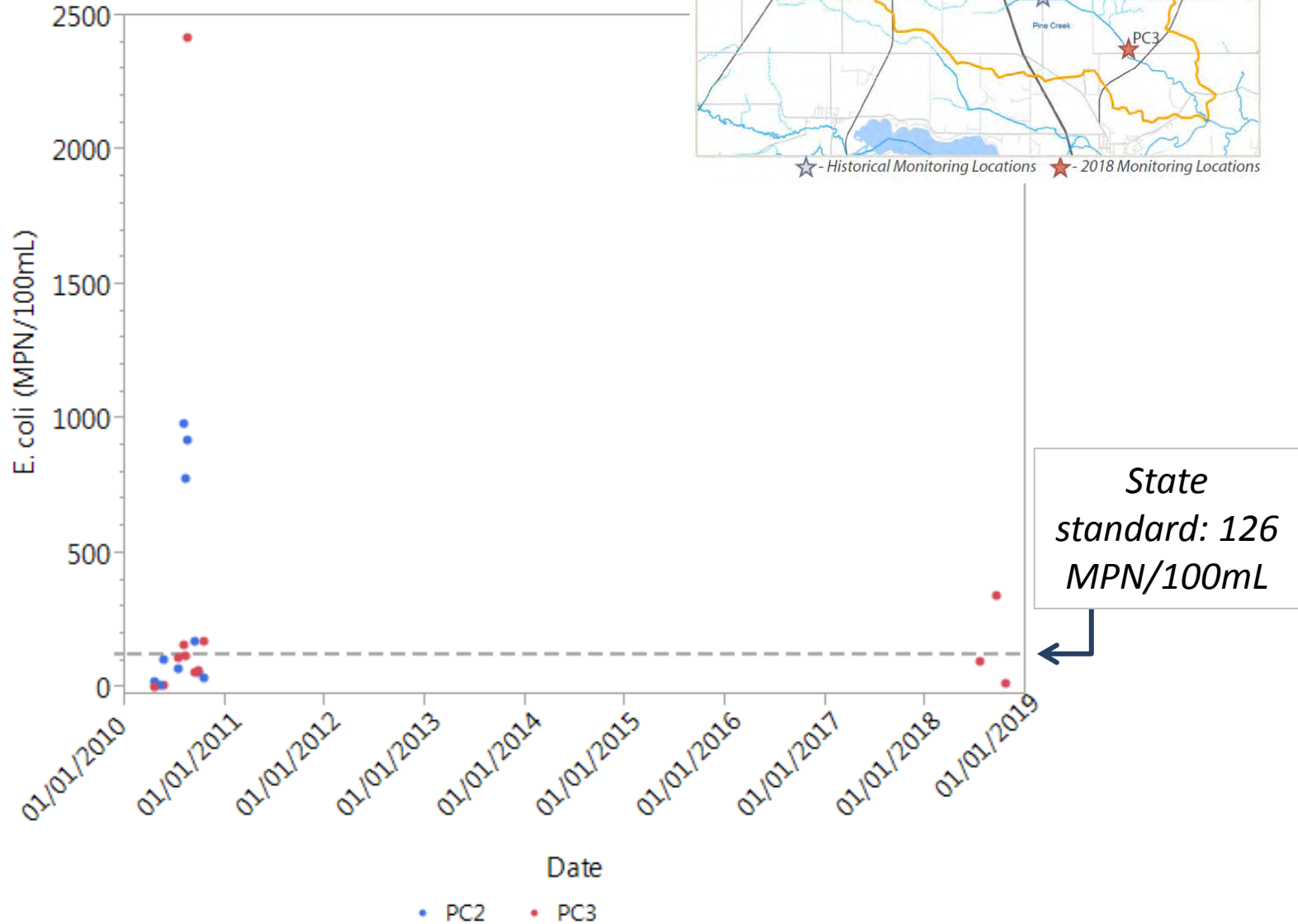
State  
standard:  
65 mg/L





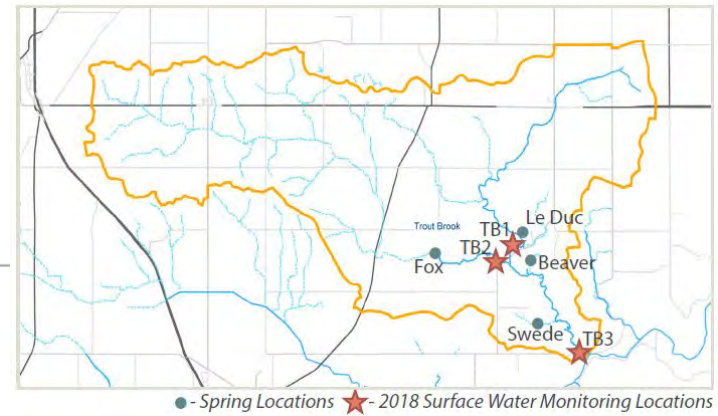
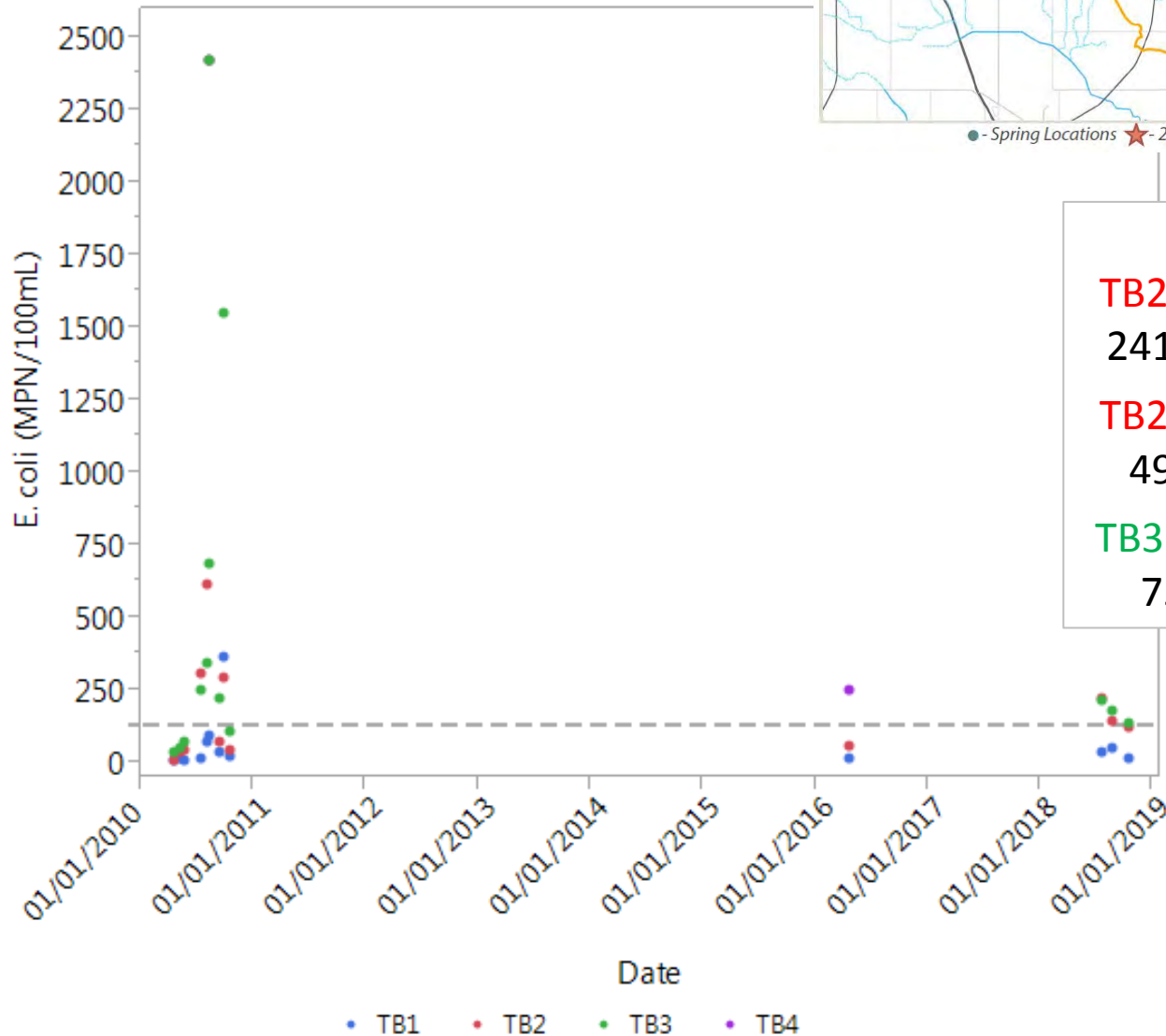
# E. coli Bacteria

## Pine Creek



# E. coli Bacteria

## Trout Brook

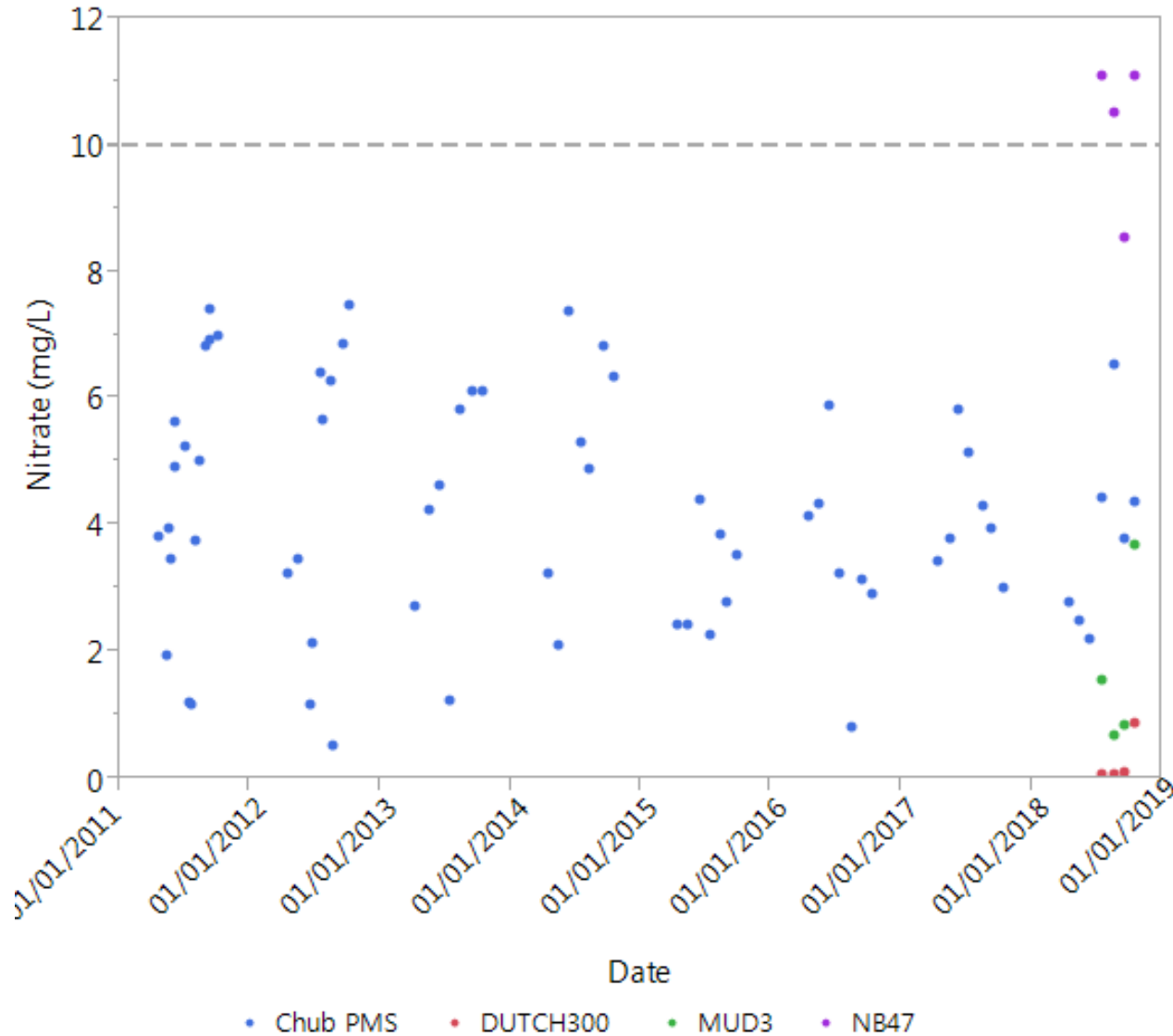
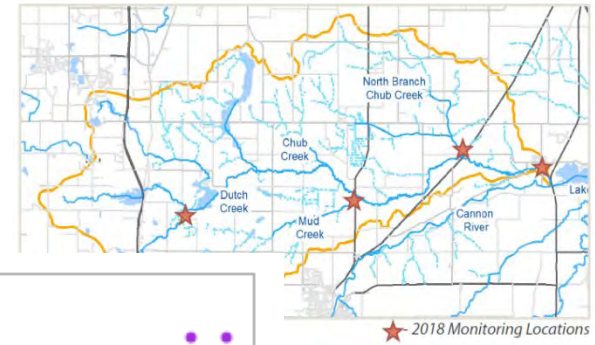


**Outliers:**  
TB2 on 8/13/10 - 241960 MPN/L  
TB2 on 9/19/18 - 49500 MPN/L  
TB3 on 9/19/18 - 7500 MPN/L

State standard: 126 MPN/100mL

# Nitrate

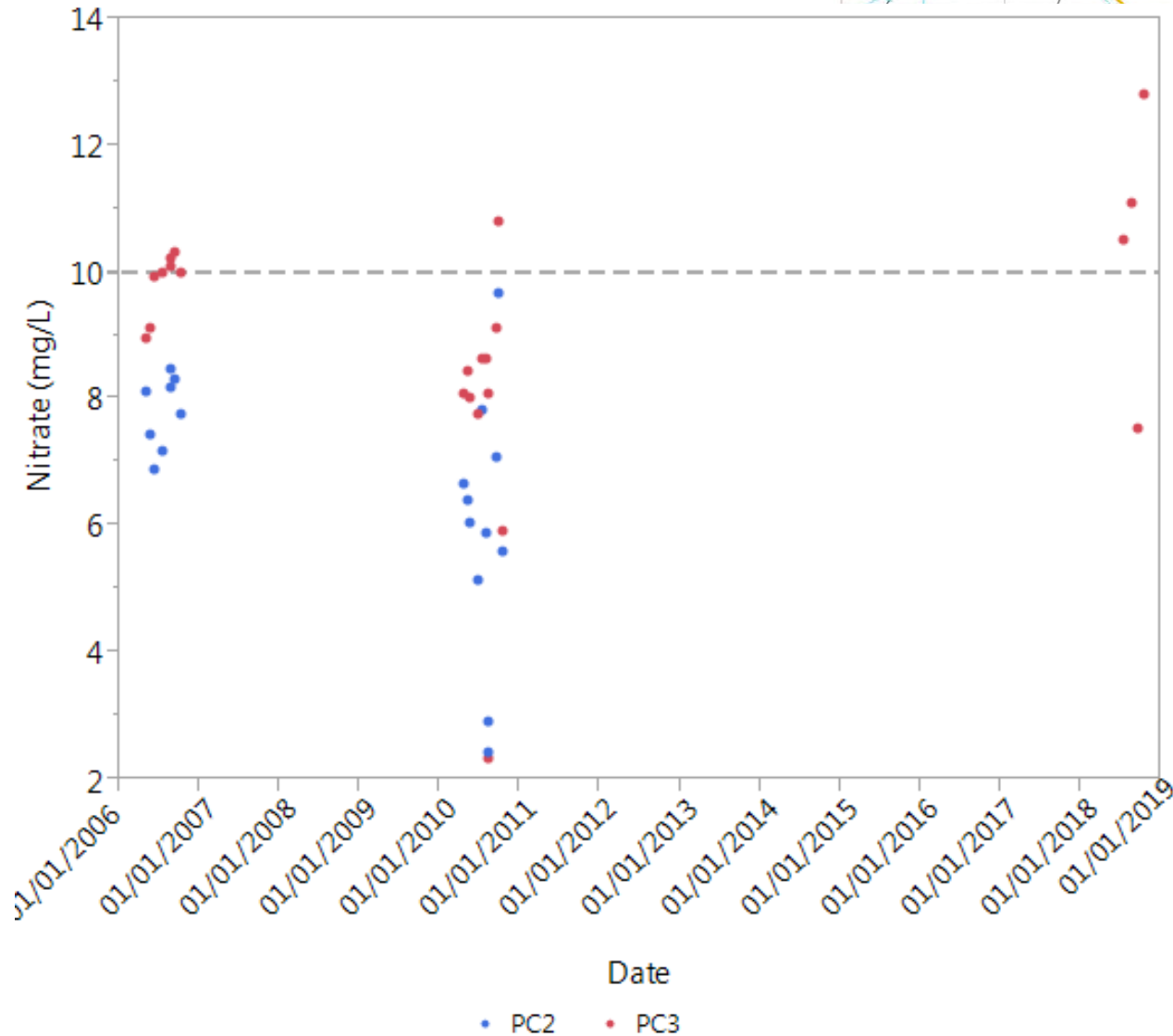
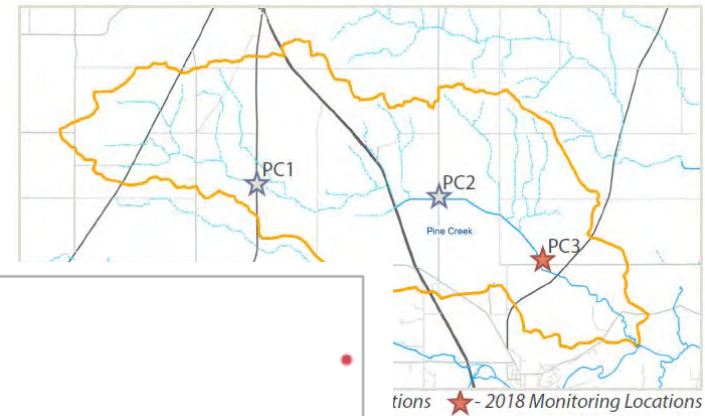
## Chub Creek



←  
*Drinking  
water  
standard:  
10 mg/L*

# Nitrate

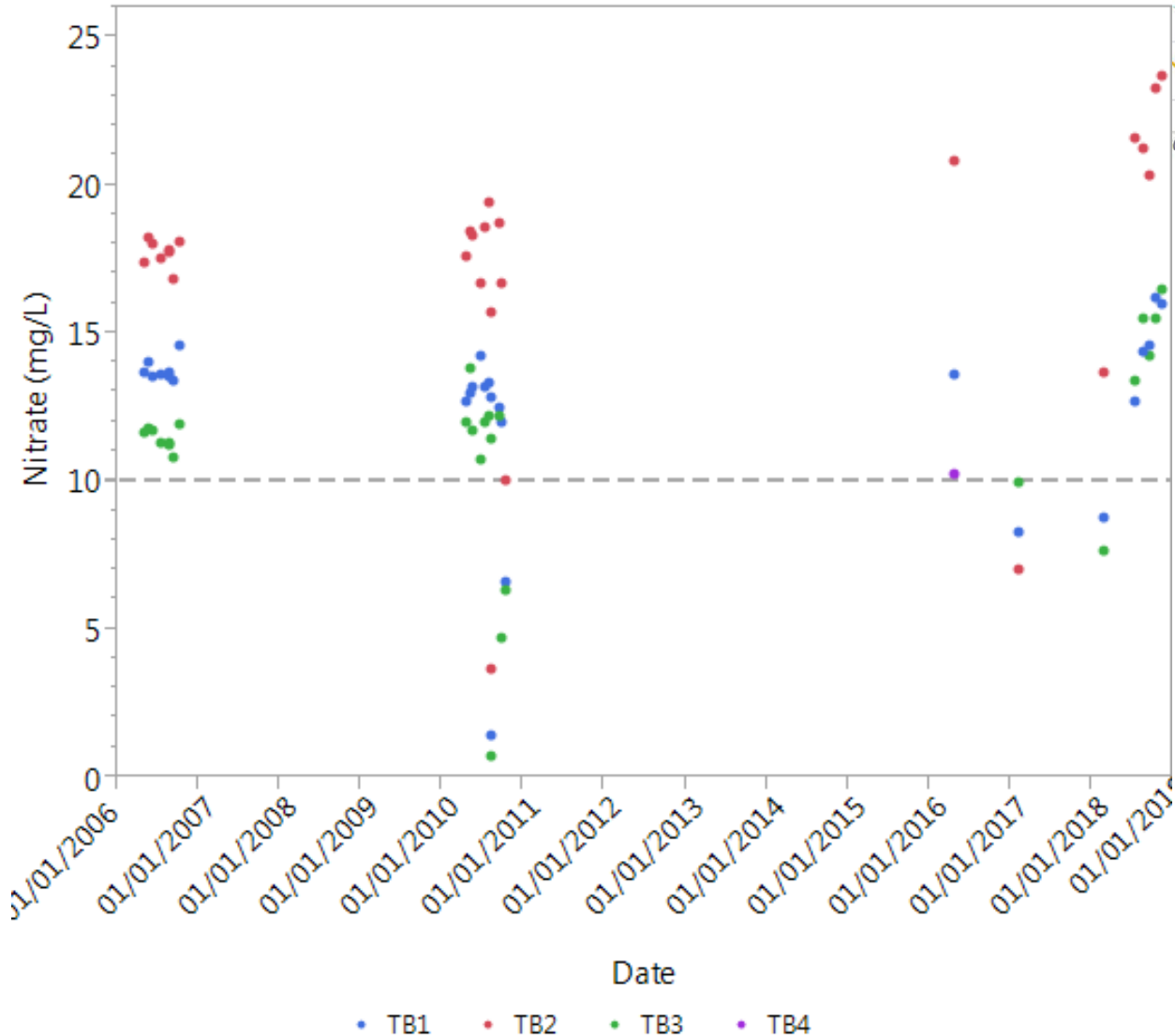
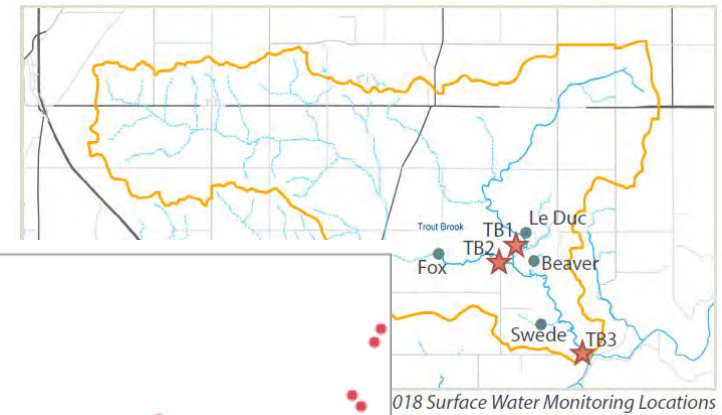
## Pine Creek



← Drinking water standard: 10 mg/L

# Nitrate

## Trout Brook





# Trout Brook Nitrate Monitoring



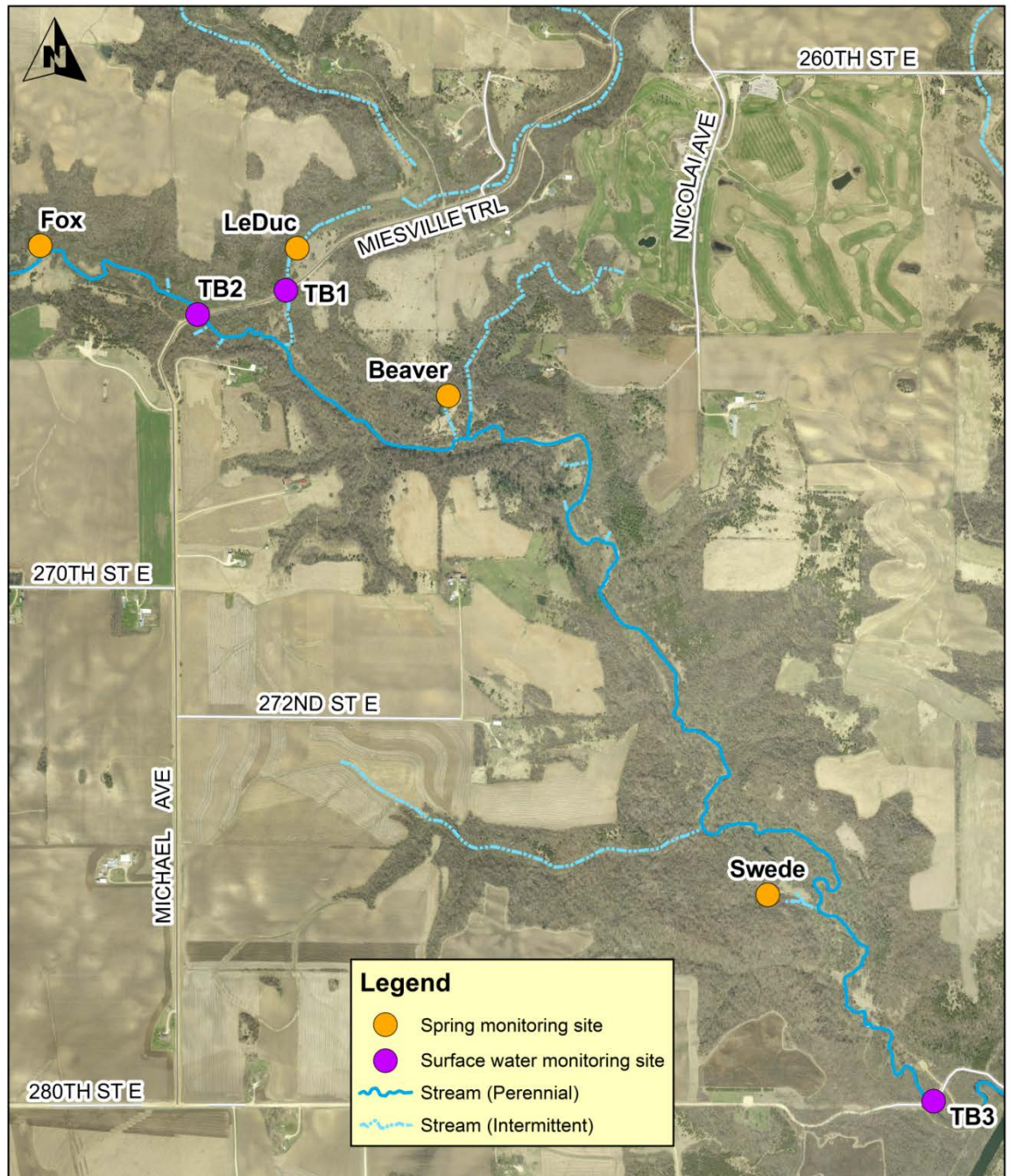
*\*\*Highest stream baseflow  
nitrate concentrations  
found in southeastern  
Minnesota*

# Monitoring Sites

## Three stream

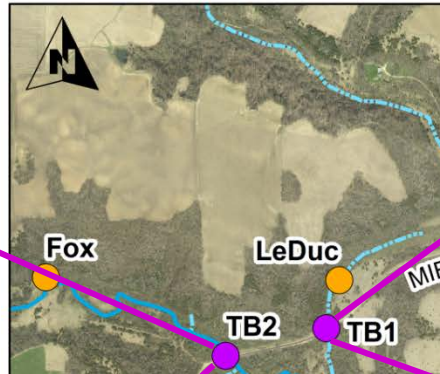
- TB1
  - East branch
- TB2
  - West branch
- TB3
  - Watershed outlet

~ 15 year data record





TB2



TB1



TB1

- *East branch*

TB2

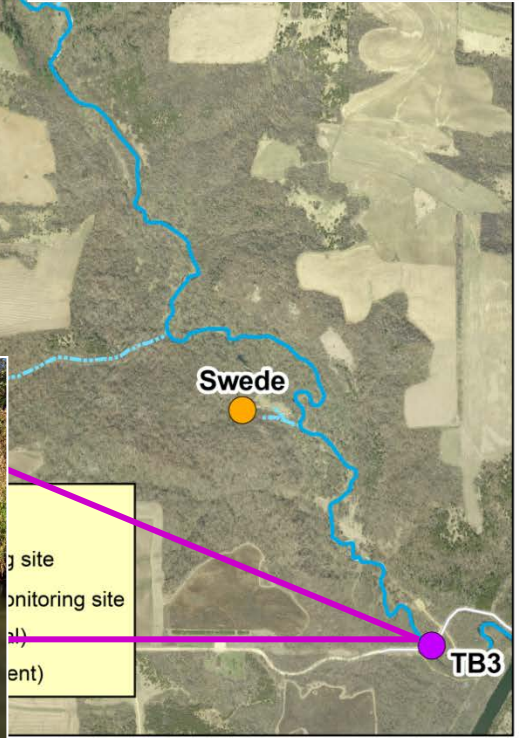
- *West branch*

TB3

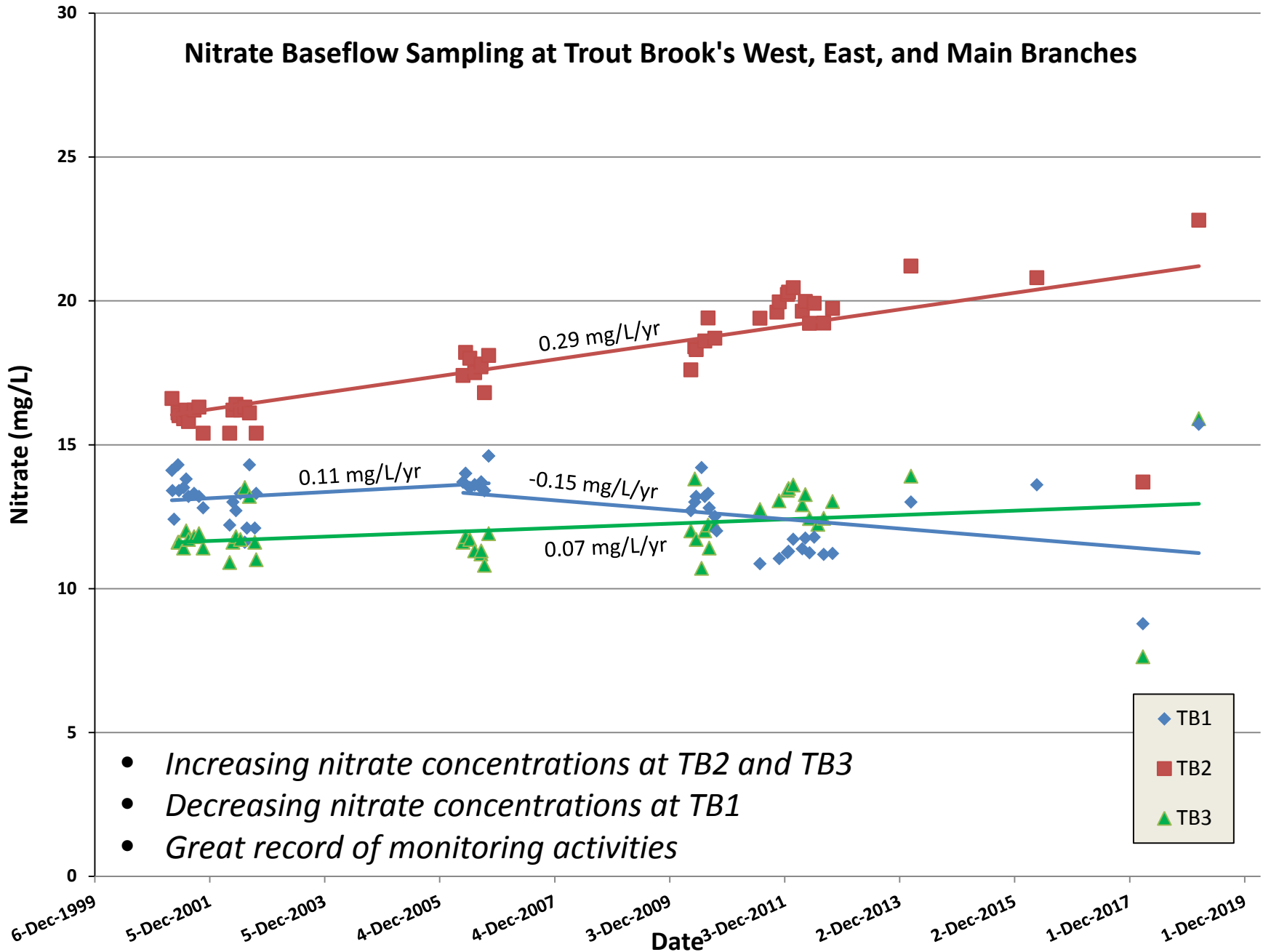
- *Watershed outlet*



TB3



# Nitrate Baseflow Sampling at Trout Brook's West, East, and Main Branches

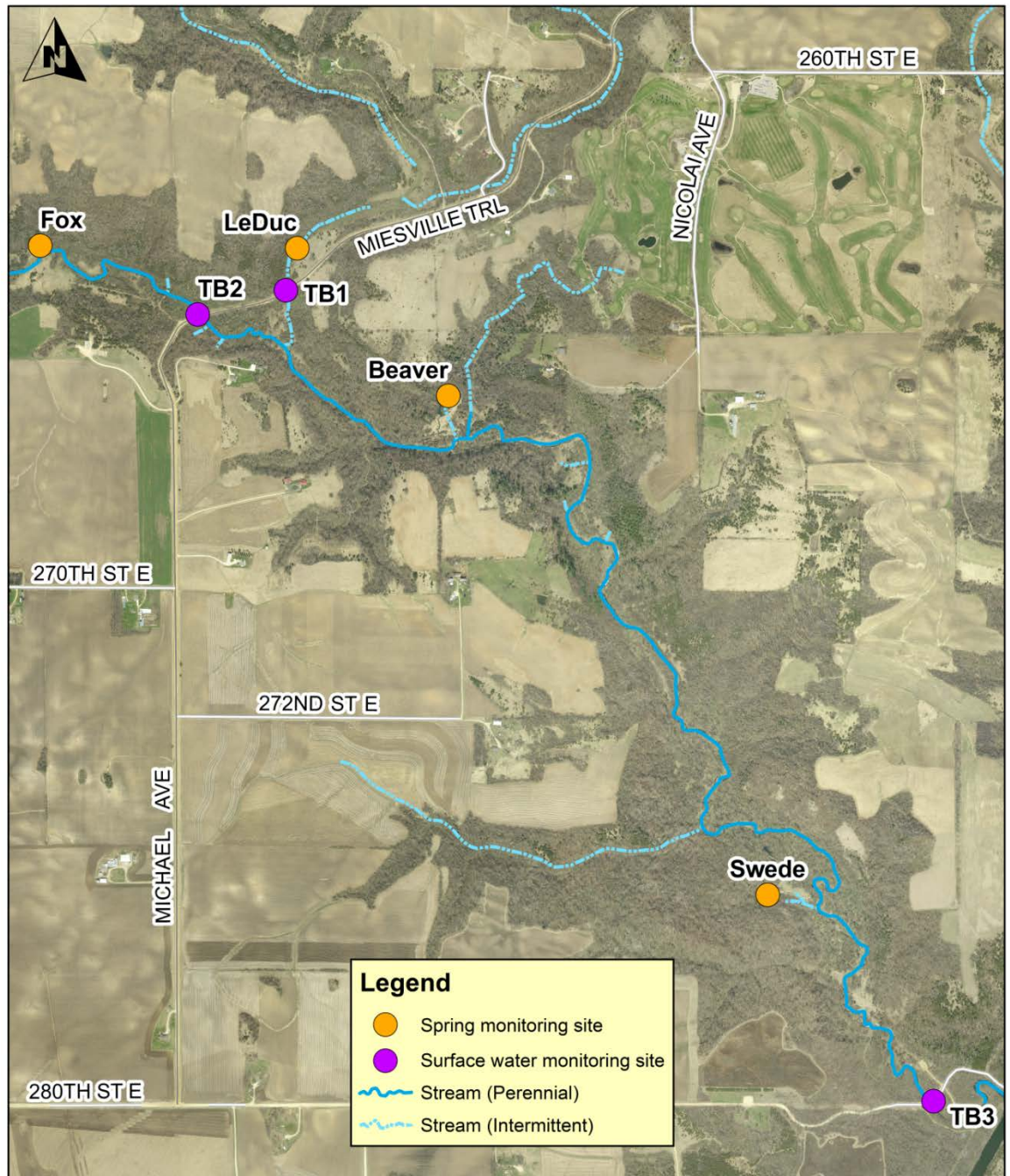


# Monitoring Sites

## Four springs

- Fox
- LeDuc
- Beaver
- Swede

~30 year data record



# Fox and LeDuc Springs



Fox Spring



LeDuc Spring



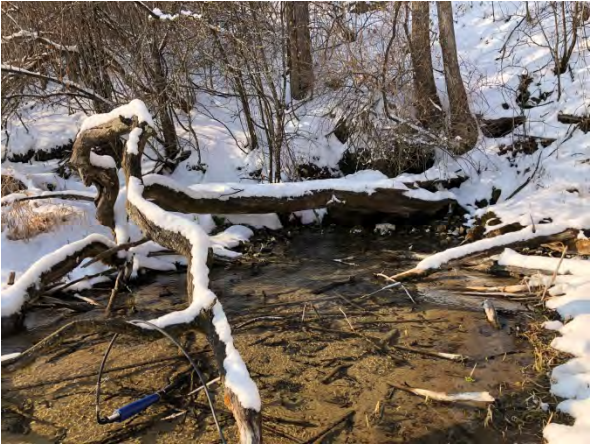
TB 1



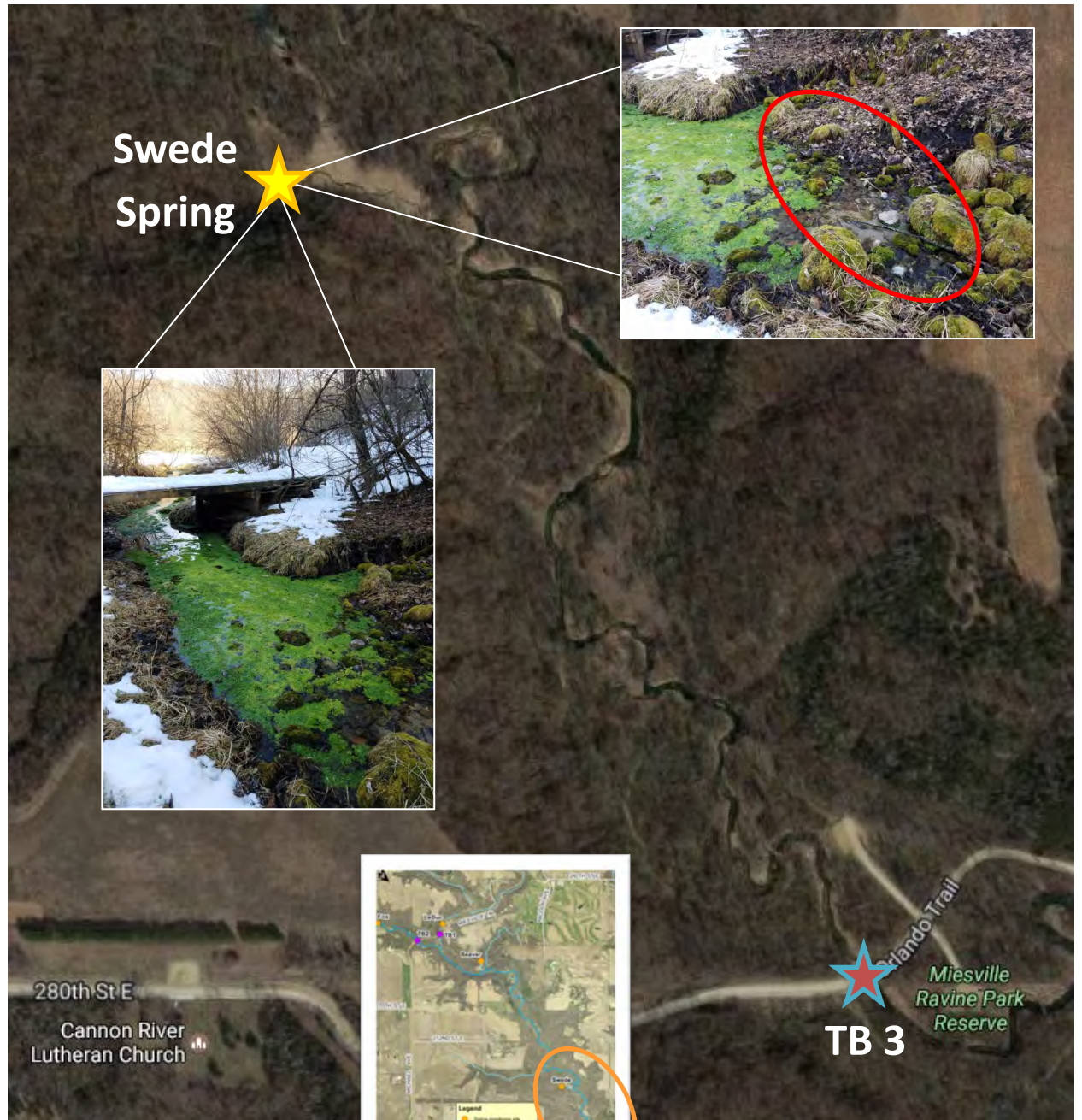
TB 2



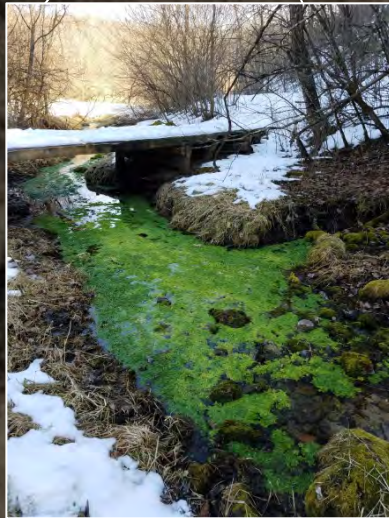
# Beaver Spring



# Swede Spring



Swede Spring



280th St E  
Cannon River  
Lutheran Church

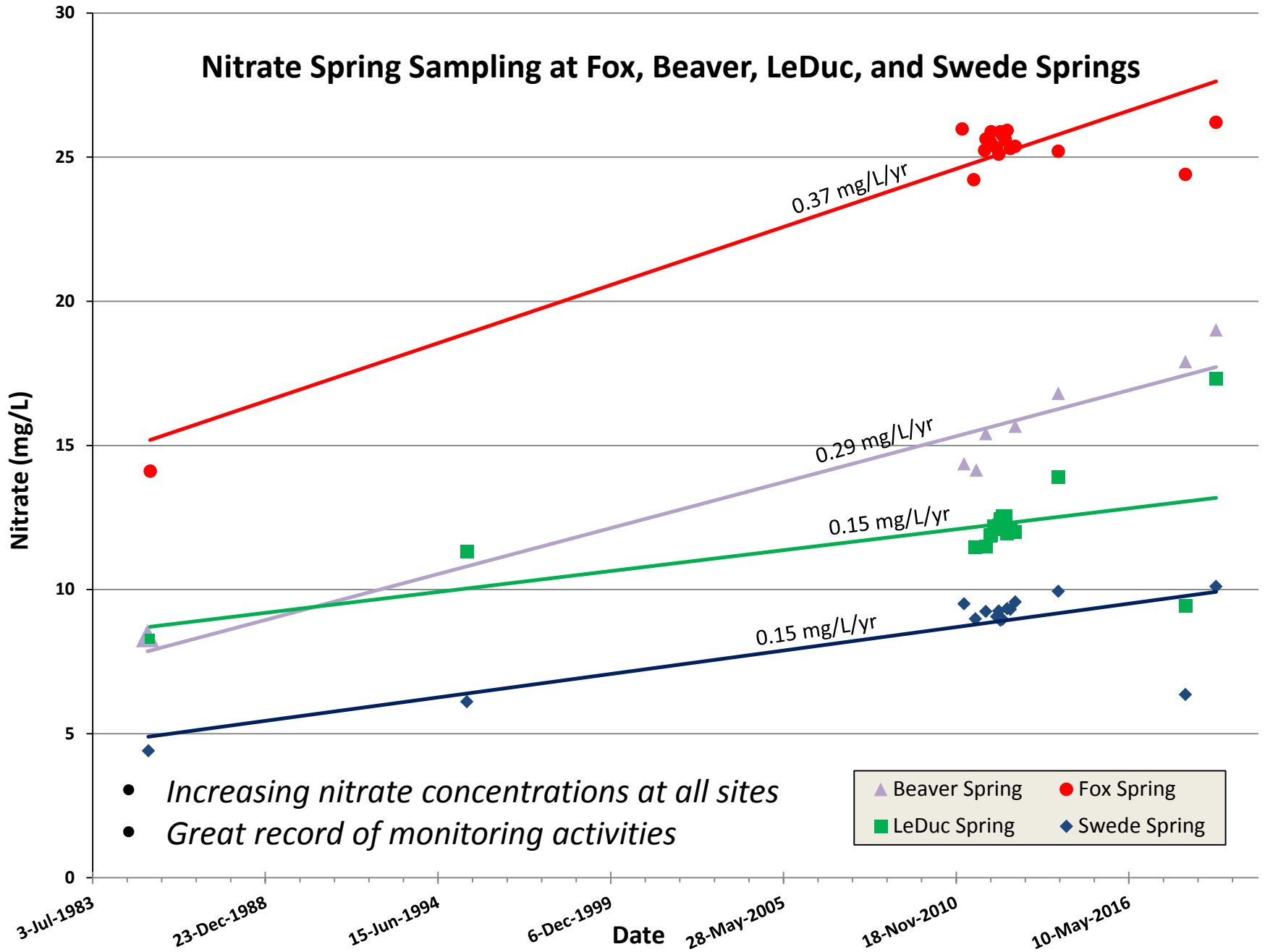


Triando Trail  
Miesville Ravine Park Reserve

TB 3



# Nitrate Spring Sampling at Fox, Beaver, LeDuc, and Swede Springs



# NCRWMO Conclusions from 2018

- Met the standard:
  - Total suspended solids
- Exceedances:
  - Total Phosphorus
  - Nitrate
  - *E. coli* bacteria
- Continued monitoring to:
  - Assess long term water quality trends
  - Track the progress towards meeting water quality goals





# QUESTIONS?



Watershed Management Organization