2009-2024

Potential Pathogens and Total Phosphorus

FULL REPORT

Water Quality Monitoring (WQM) Program

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DATA PARAMETERS INCLUDED IN THIS REPORT

This report shows lab data parameters on the sites of specific concern. Monthly baseline monitoring data is reported in the Surface Water Integrated System (https://dnrx.wisconsin.gov/swims/login.jsp) and can be seen on the Water Action Volunteers Program Stream Monitoring Data Dashboard (https://connect.doit.wisc.edu/wav-dashboard).
Lab testing is run by Leuther Lab LLC, AgSource Lab and the Wisconsin State Lab of Hygiene (WSLH).
Lab data is sent every end of the season to the Laboratory Coordinator of the Wisconsin Department of Natural Resources (DNR).

Escherichia coli (E. coli):

- Pollution indicator of fecal pathogens (i.e., *Salmonella* and *Cryptosporidium*).
- Lives in warm blooded animal feces, and certain strains cause serious or even lethal digestive problems in humans.
- Human and hog feces carry over one million *E. coli* per gram.
- The safety standard for rivers is below 126 colony forming units (cfu)/100mL. 750 cfu/100ml requires a swimming advisory to be posted, and 1,000 cfu/100mL mandates closing of public beaches.
- *The highest E. coli result was seen in 2019: 170,000* cfu/100ml, *over 1,300 times the standard.*

Total Phosphorus (TP):

- Pollution indicator nutrient.
- Low levels of TP (up to 0.075 mg/L) are naturally found in surface waters, but high amounts cause "eutrophication":
  Excess algae and plant growth ➥ Death and decomposition ➥ Oxygen levels drop dramatically ➥ Die-off of fish and other aquatic organisms.
- The most widespread water pollutant in Wisconsin due to soil erosion, manure lagoons and septic systems, detergents and runoff from farmland or lawns.
- *The highest TP result was seen in 2019: 4.22 mg/L, 56 times the standard.*

Background (heterotrophic) bacteria:

- Depend on other organisms or decomposed organic matter to survive.
- Some of the parasitic species can cause cholera and tetanus; *E. coli* also belongs to this group.
- *500,000,000 cfu/100 mL background bacteria found in just one sample in 2020! Over 50,000/100mL is considered high background bacteria.*

Staphylococcus aureus (S. aureus):

- Water quality and MRSA (Methicillin Resistant *S. aureus*) indicator bacteria.
- MRSA is a very dangerous and infectious bacteria that may seriously affect skin, respiratory system, blood, create toxicity shock, and more. It has been linked to pig and dairy CAFO´s.

Precipitation: can create large pulses of water that move quickly over and through the ground, carrying nutrients and pathogens from manure sources, agricultural fields, lawns, septic systems, etc., into surrounding water bodies and groundwater. Nutrient runoff contributes to the eutrophication of aquatic ecosystems.

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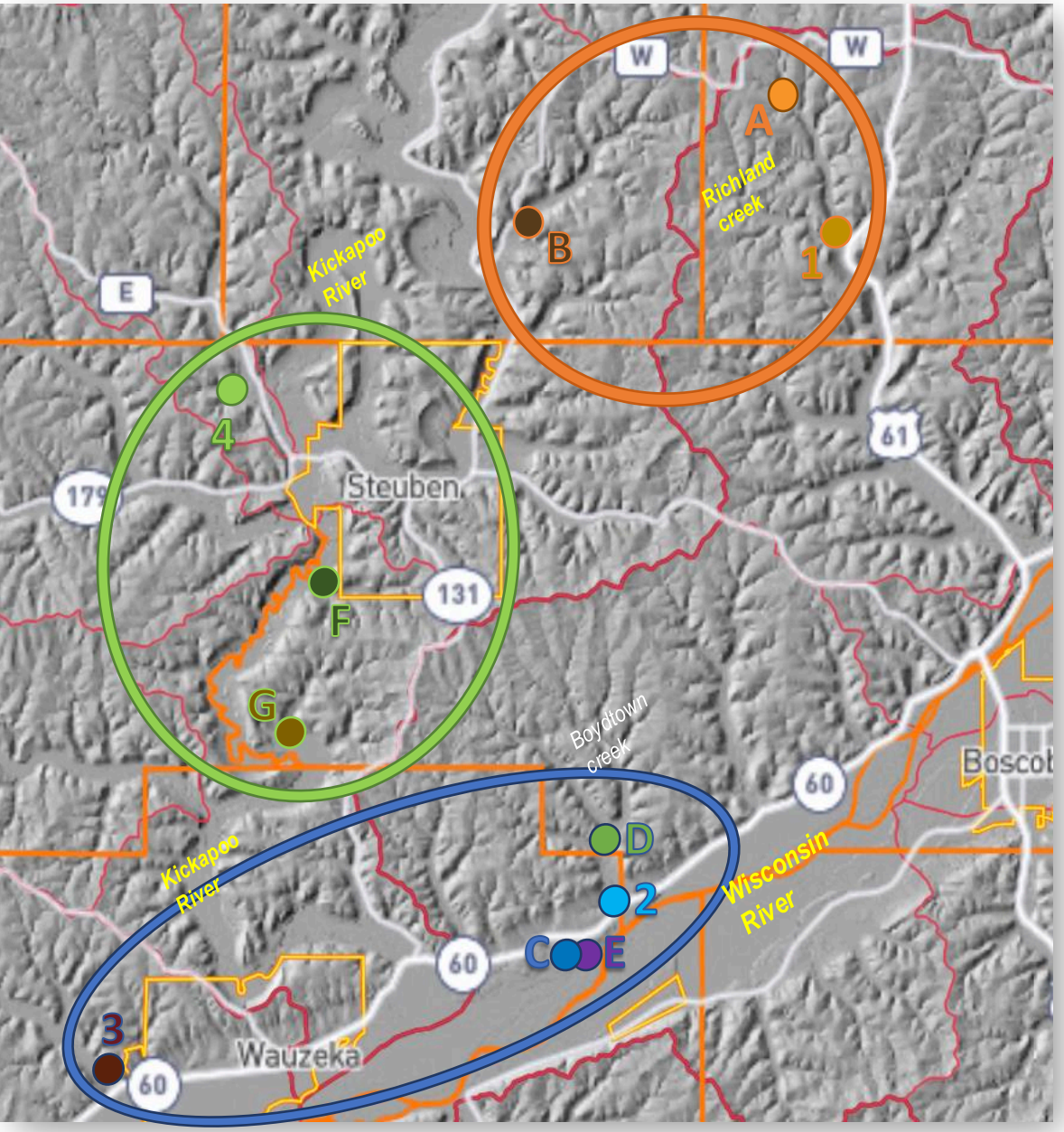
ALL SITES LOCATION MAP

Crawford County



ZONE 1 (Scott & Haney Townships):

A. Station #10044917 (Richland Creek at Byers Road), ***impaired****

B. Station #10056913 (Unnamed Trib 1183600 at Drake Rd.), *was #10044132*

1. Station #10044131 (Richland Creek – Childs Hollow Rd Bridge)

ZONE 2 (Wauzeka Township):

C. Station #10032119 (WI River Tributary, 0.5 mi SE of STH 60 and Knob Ln Intersection), ***impaired****

D. Station #10032123 (Boydtown Creek 400 ft west of Hilldale Rd)

E. Station #10052569 (Unnamed 5035112 at Spring), ***impaired****

2. Station #10013610 (Boydtown Creek Station 1- From STH 60 Upstream)

3. Station #10029558 (Little Kickapoo Creek, Hwy 60 St 1)

ZONE 3 (Marietta Township):

F. Station #10052670 (Unnamed 5034616 at Kickapoo Valley Road)

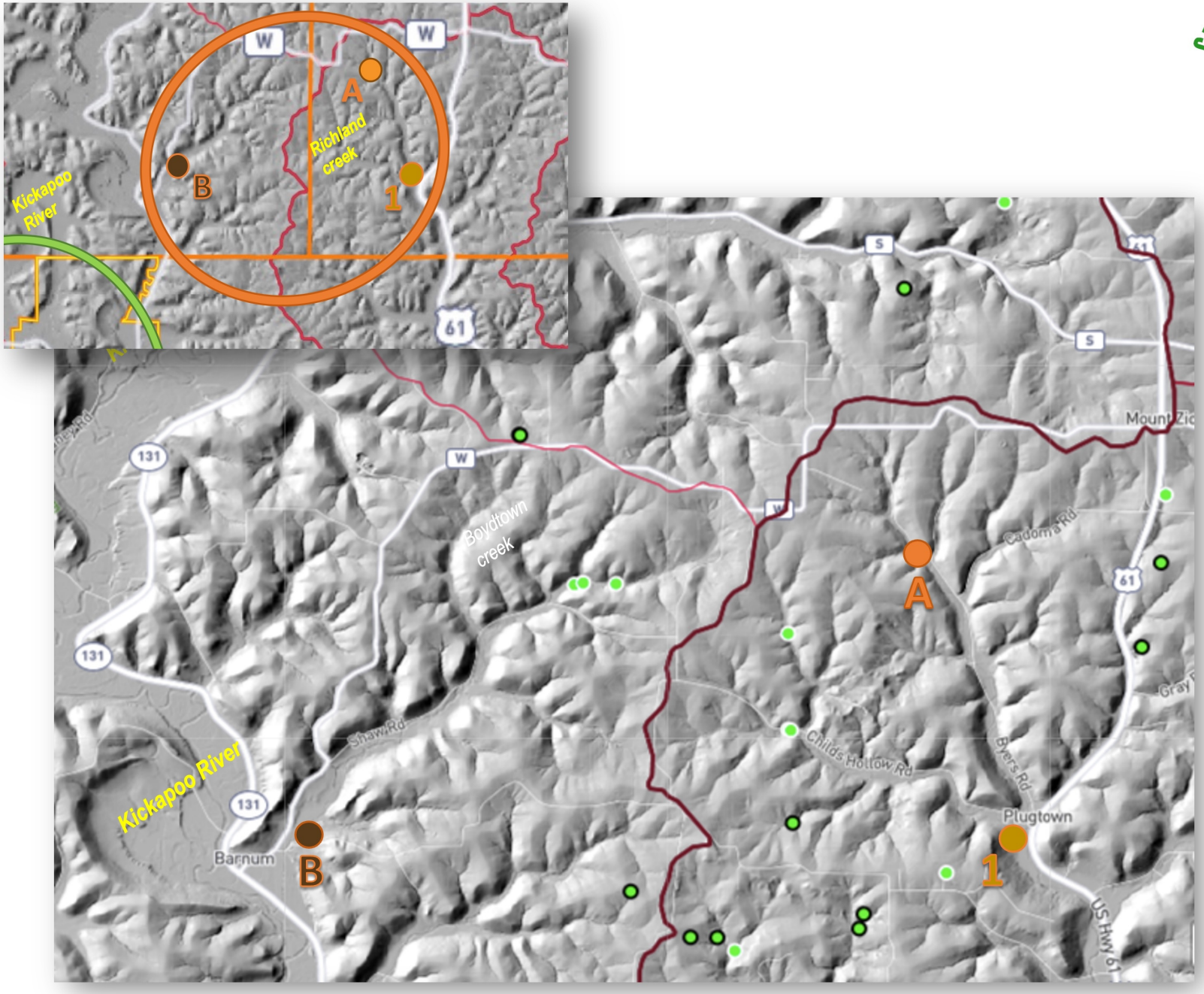
G. Station #10052671 (Unnamed 5034666 at Kickapoo Valley Road)

4. Station #10009025 (Citron Creek #1 Bridge on Cty E)

Watershed boundary
Sub-watershed boundary

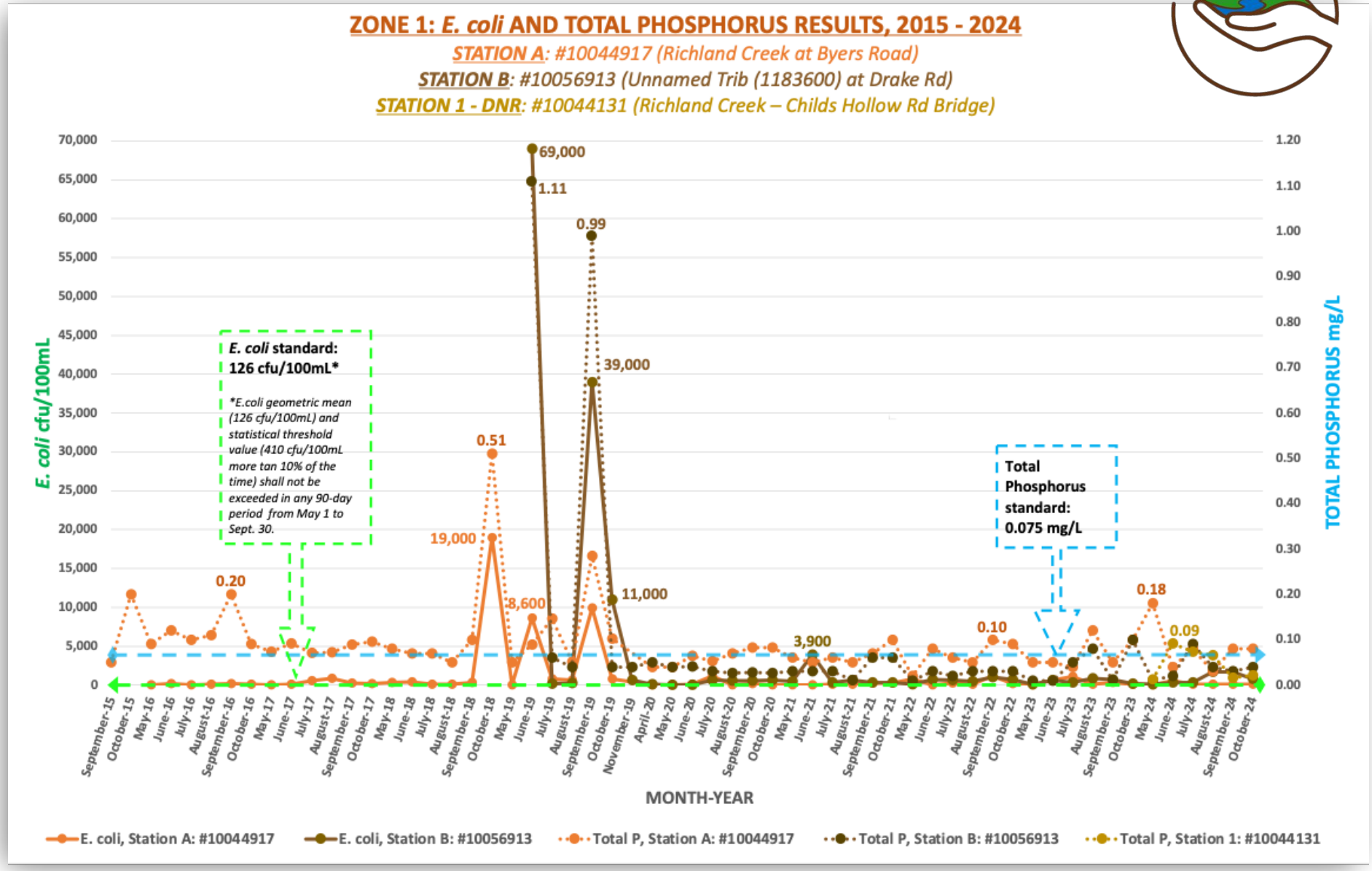
***Impaired (for high Total Phosphorus)**: Waters that do not meet WQS (Water Quality Standards) are placed on Wisconsin's Impaired Waters List -also known as the 303(d) list-, under Section 303(d) of the CWA (Federal Clean Water Act).*

ZONE 1: Site location map

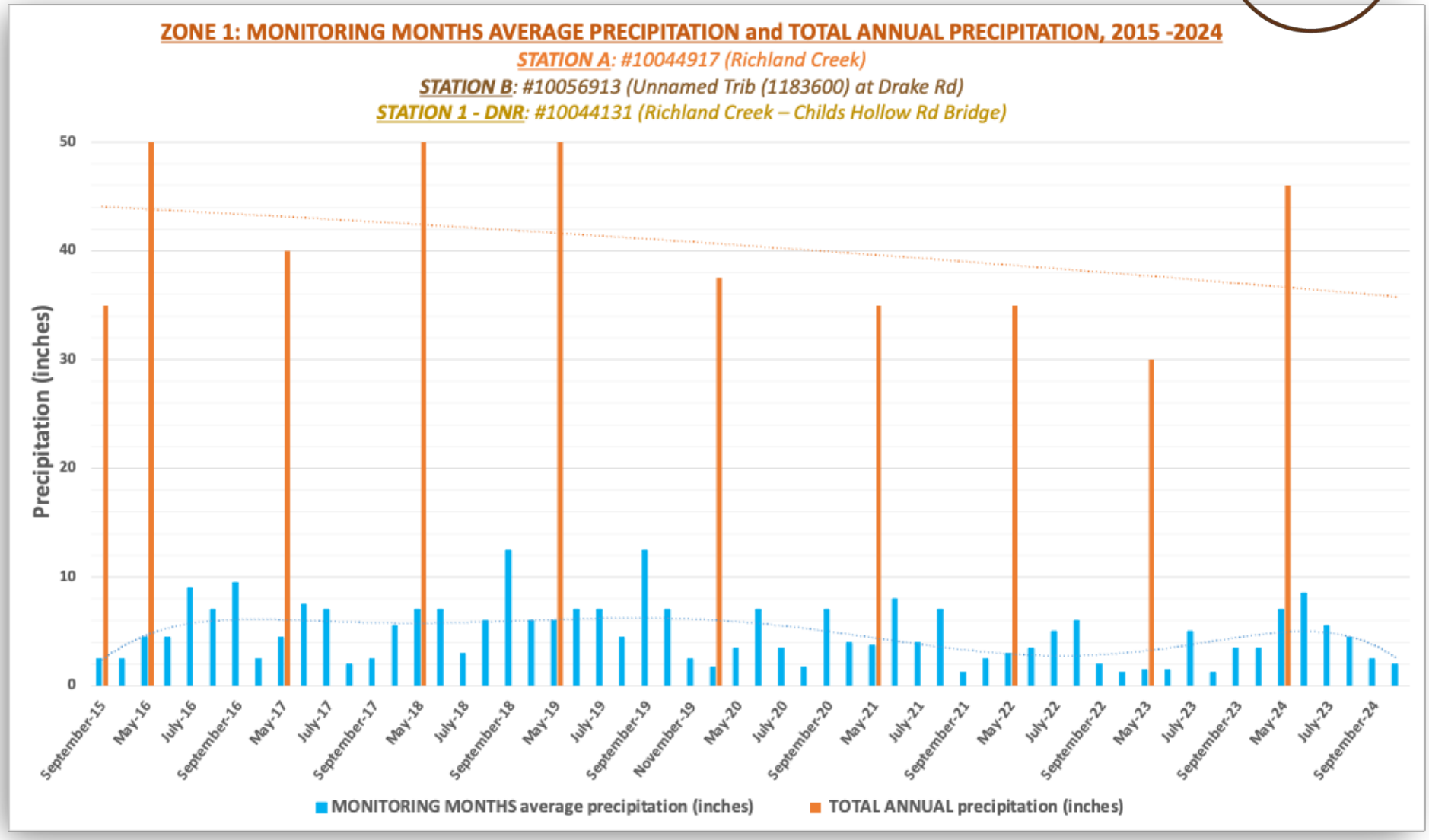


As identified by CSP's Karst Landscapes and Groundwater Susceptibility Survey of Crawford Co.

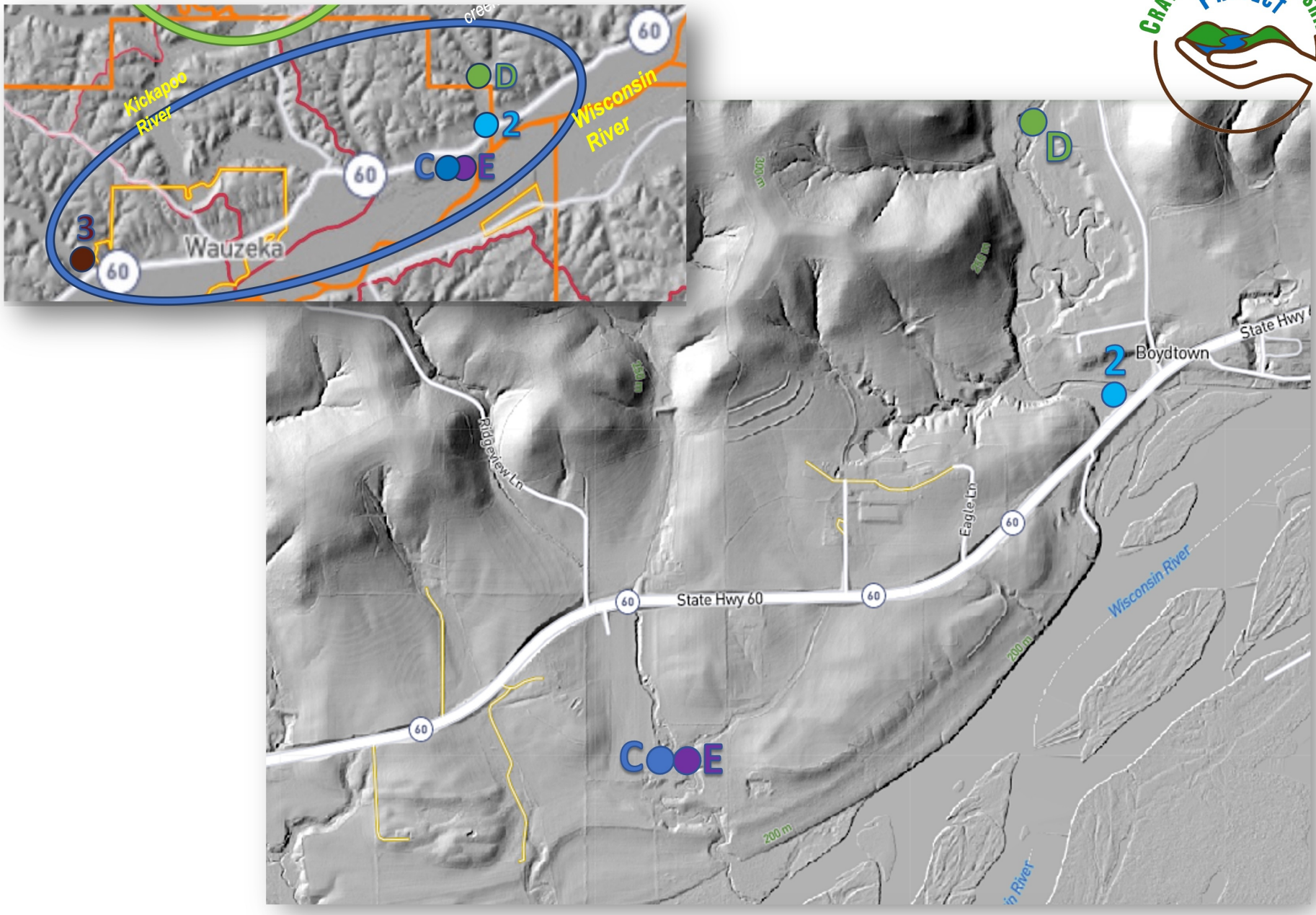
ZONE 1: *E. coli* & Total Phosphorus results, 2015 - 2024



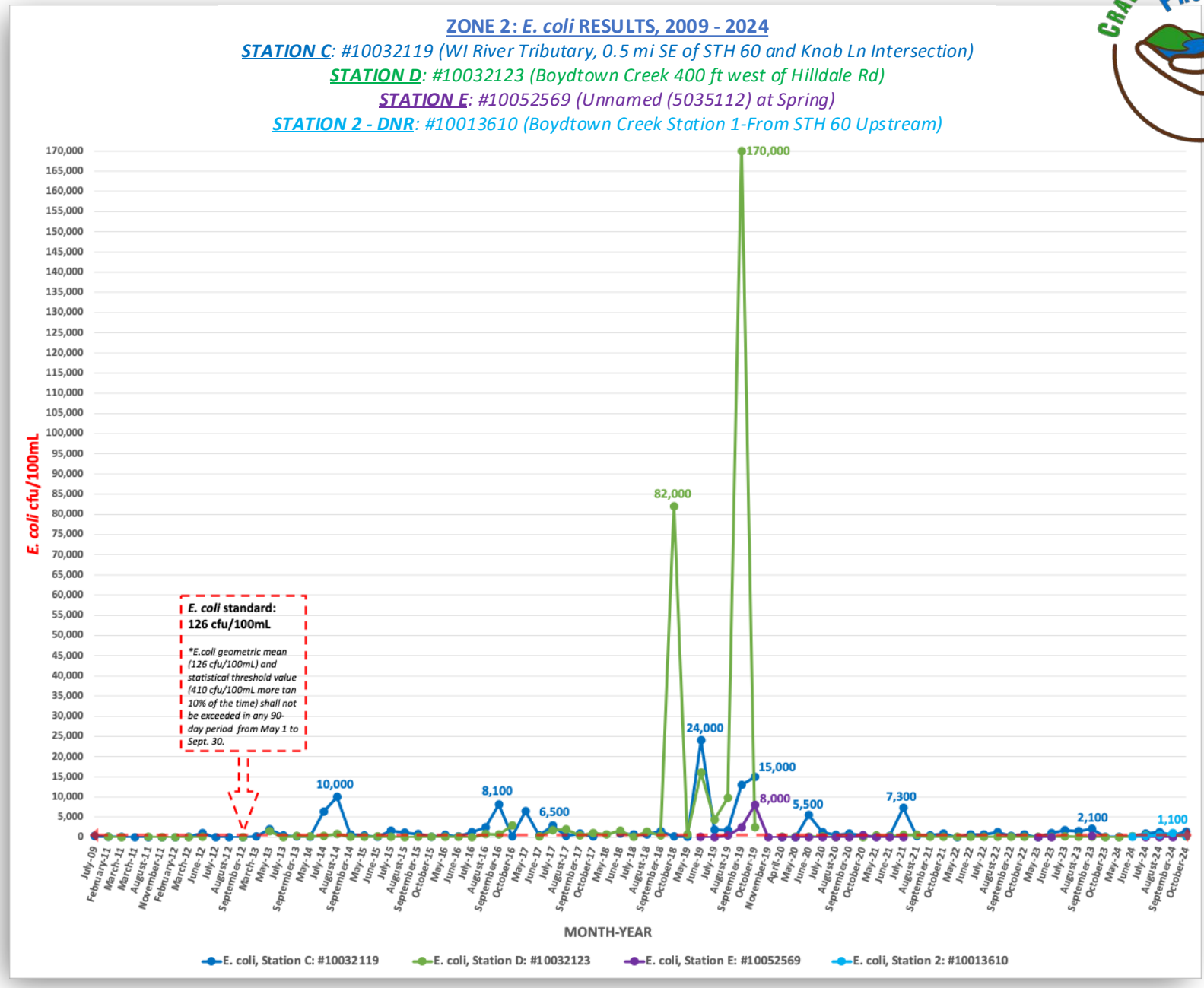
ZONE 1: Monitoring Months Average Precipitation & Total Annual Precipitation (inches), 2015 - 2024



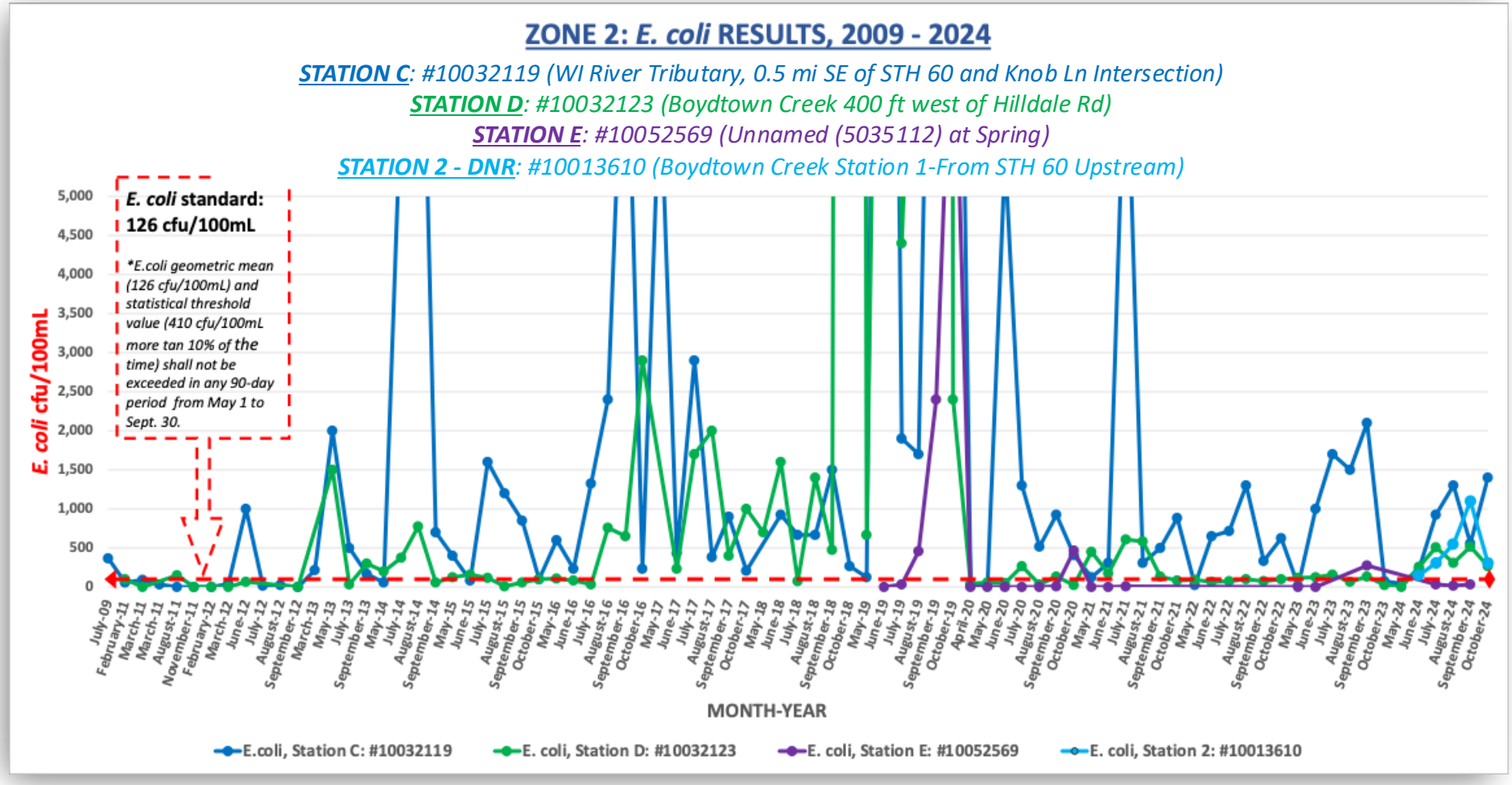
ZONE 2: Site location maps



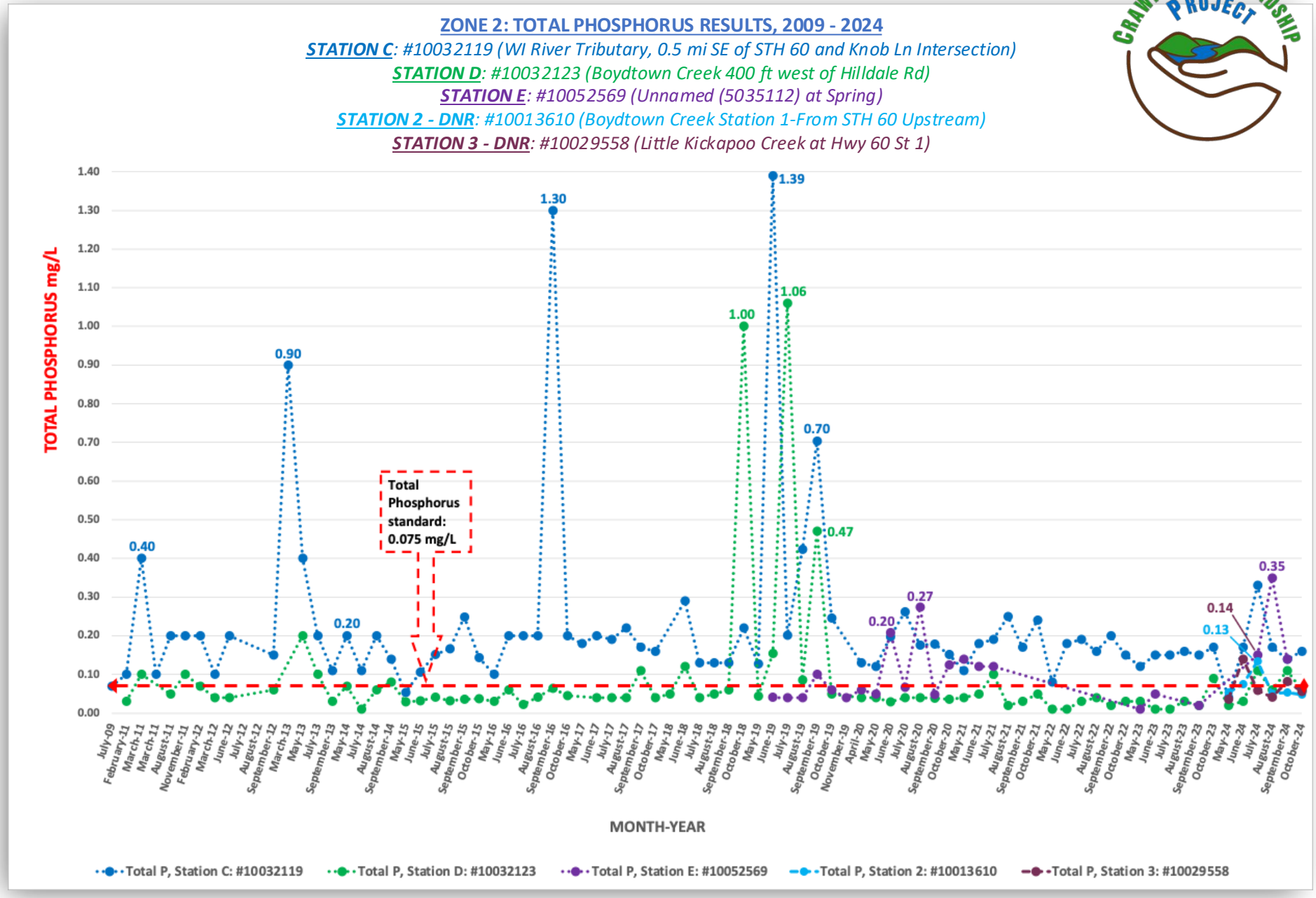
ZONE 2: *E. coli* results (0 up to 170,000 cfu/100mL), 2009 - 2024



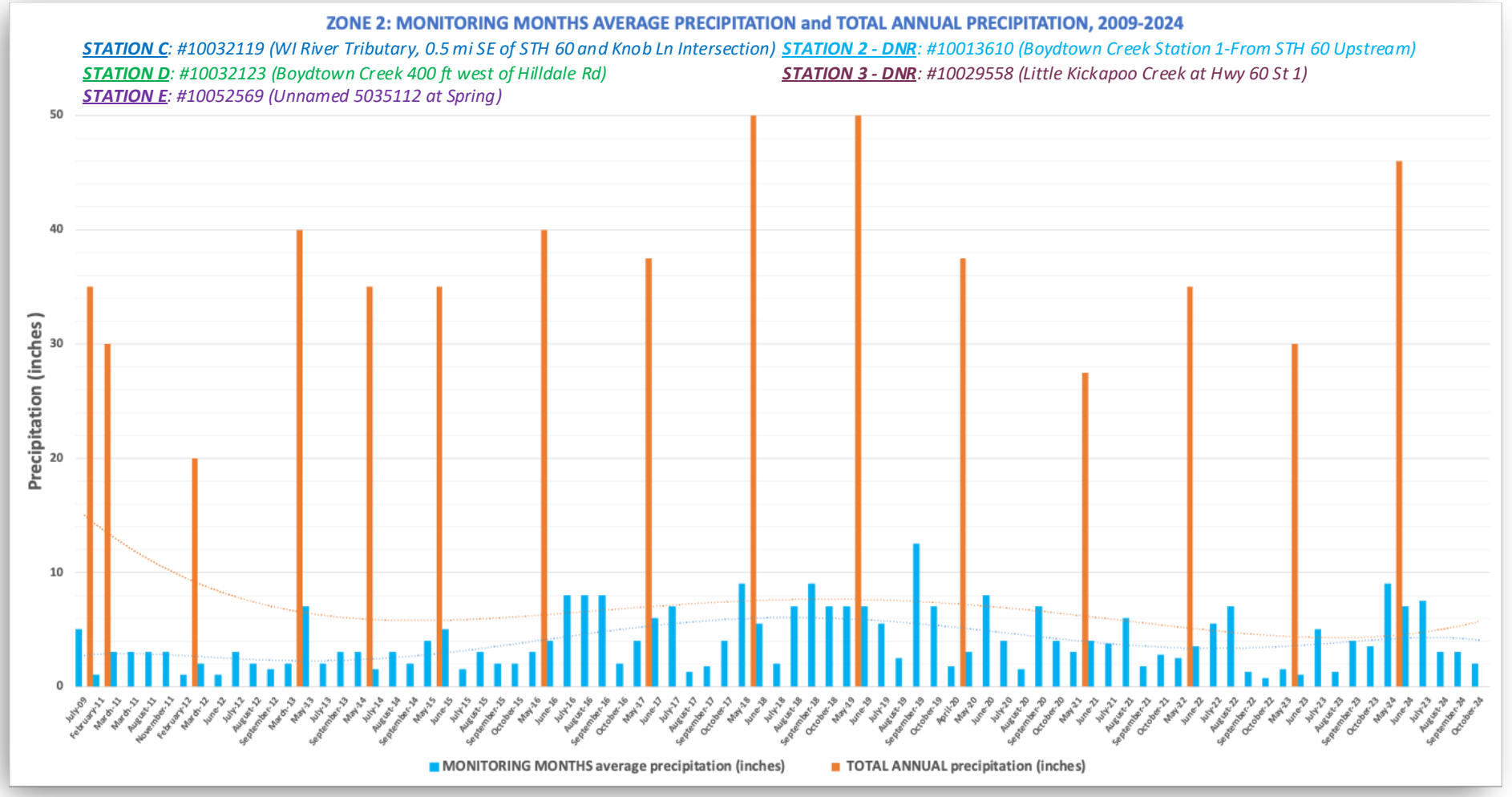
ZONE 2: *E. coli* results (0 up to 5,000 cfu/100mL), 2009 - 2024



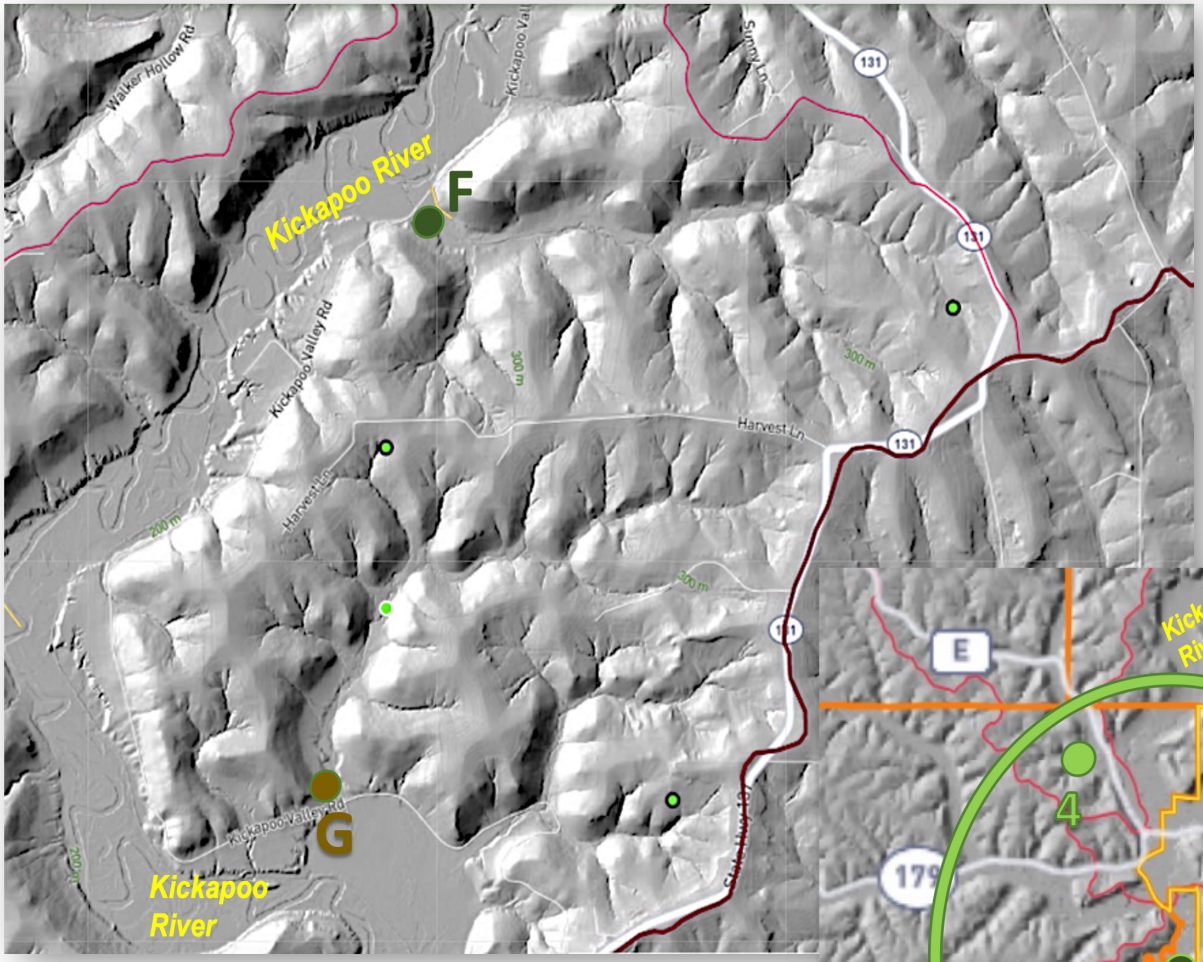
ZONE 2: Total Phosphorus results, 2009 - 2024

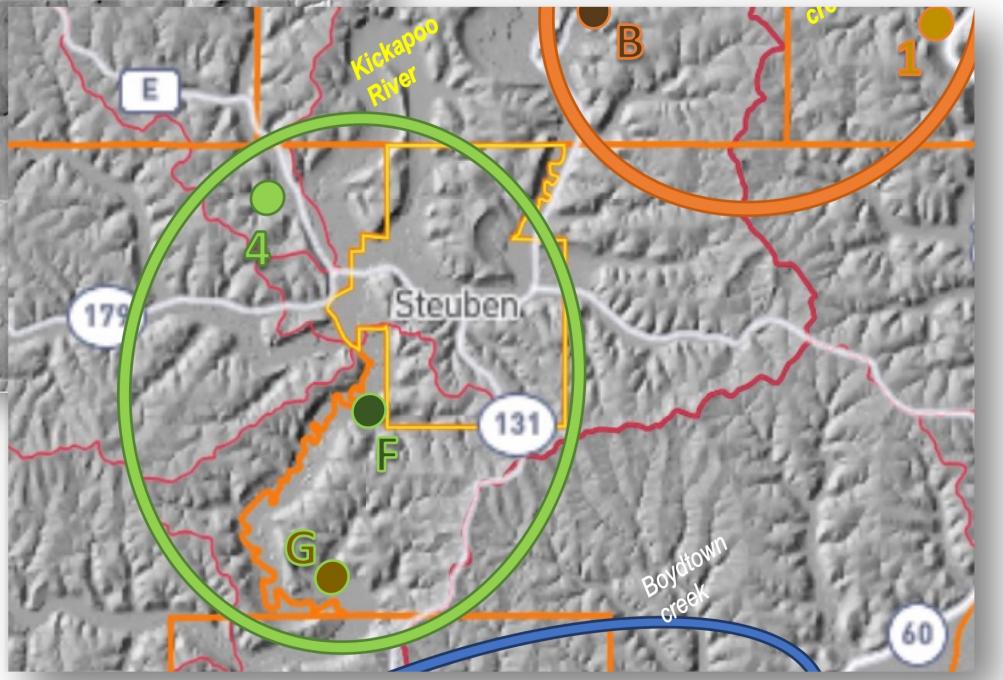


ZONE 2: Monitoring Months Average Precipitation & Total Annual Precipitation (inches), 2009 - 2024



ZONE 3: Site location maps

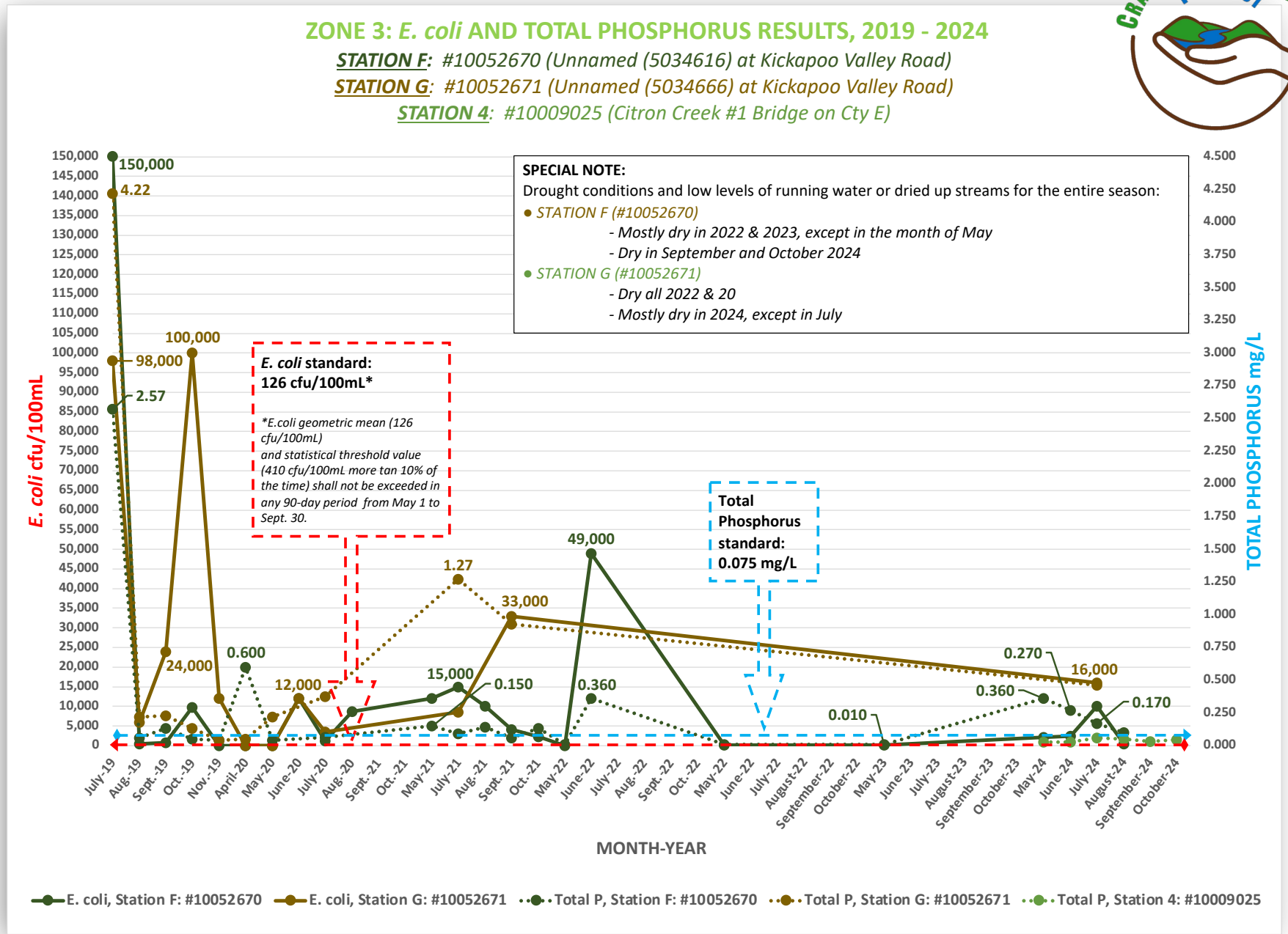




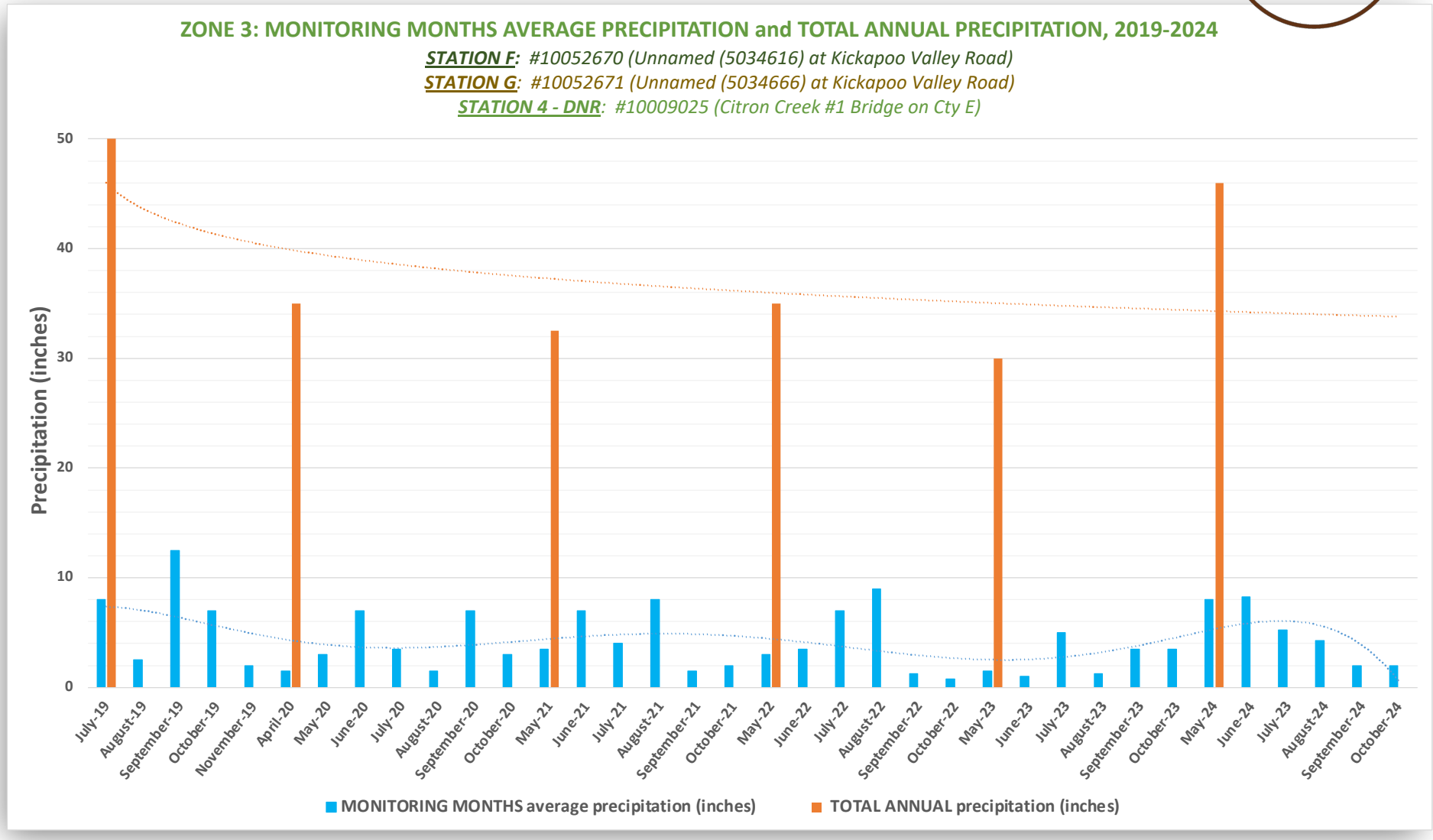
- Watershed boundary
- Sub-watershed boundary
- Possible sinkhole*
- Probable sinkhole*

** As identified by CSP's Karst Landscapes and Groundwater Susceptibility Survey of Crawford Co.*

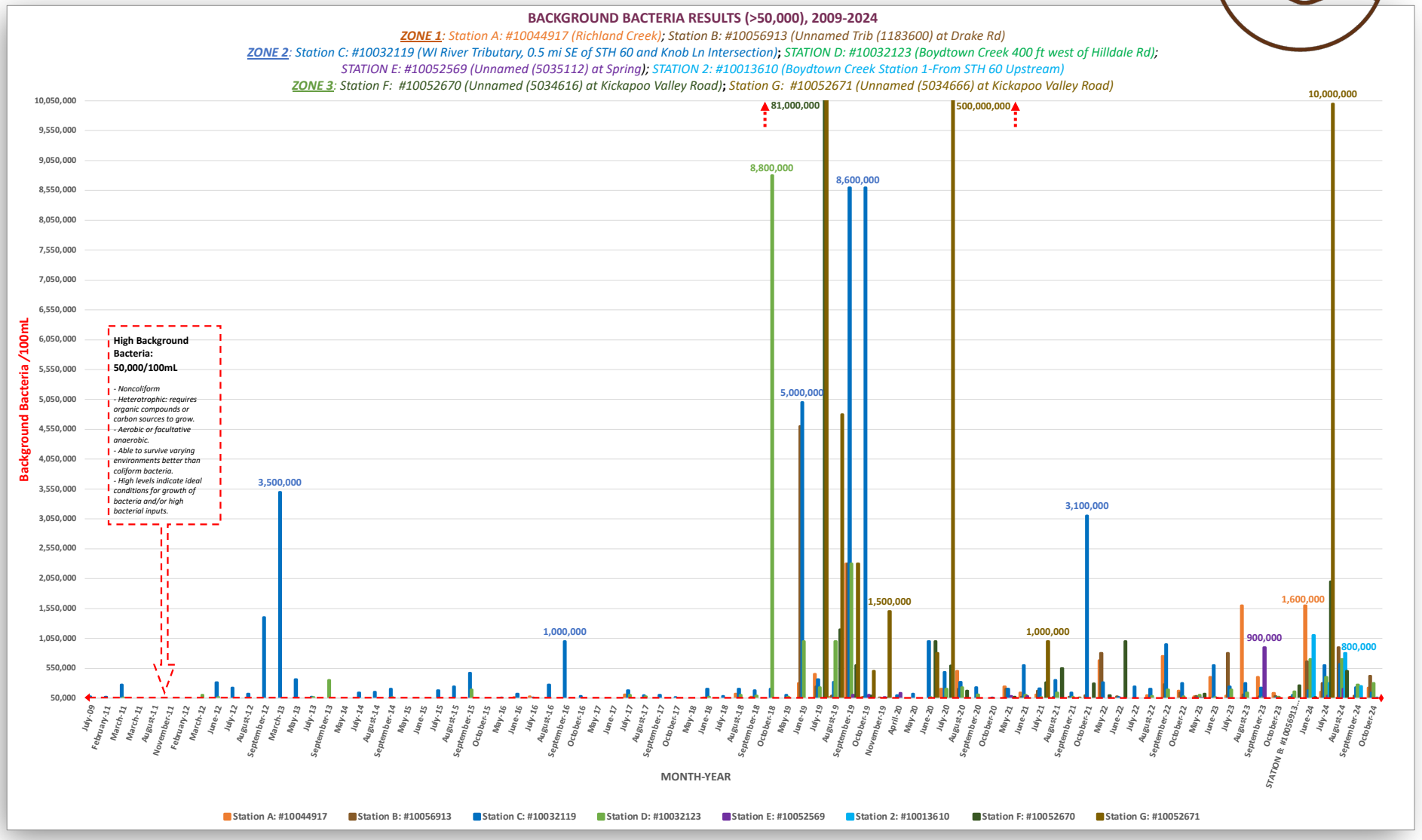
ZONE 3: *E. coli* and **Total Phosphorus** results, 2019 - 2024



ZONE 3: Monitoring Months Average Precipitation & Total Annual Precipitation (inches), 2019 - 2024



ZONES 1-3: Background Bacteria results (>50,000/100mL), 2009 - 2024



ZONES 1&2: *Staphylococcus Aureus* (& **MRSA** when present and/or tested for), 2009 - 2024

***Staphylococcus aureus* RESULTS (and MRSA when present and/or tested for), 2009-2024**

ZONE 1: *Station A: #10044917 (Richland Creek); Station B: #10056913 (Unnamed Trib (1183600) at Drake Rd)*

ZONE 2: *Station C: #10032119 (WI River Tributary, 0.5 mi SE of STH 60 and Knob Ln Intersection); STATION D: #10032123 (Boydtown Creek 400 ft west of Hilldale Rd); STATION E: #10052569 (Unnamed (5035112) at Spring); STATION 2: #10013610 (Boydtown Creek Station 1-From STH 60 Upstream)*

MRSA present at Station A:
✓ Present in July, August & October, 2020
✓ 100/100mL in September, 2020

No MRSA testing in 2021-2023

MRSA present at Station C:
✓ Present in July, August, September & October, 2020

No MRSA testing in 2021-2023

MRSA present at Station D:
✓ Present in July, August, September & October, 2020

No MRSA testing in 2021-2023

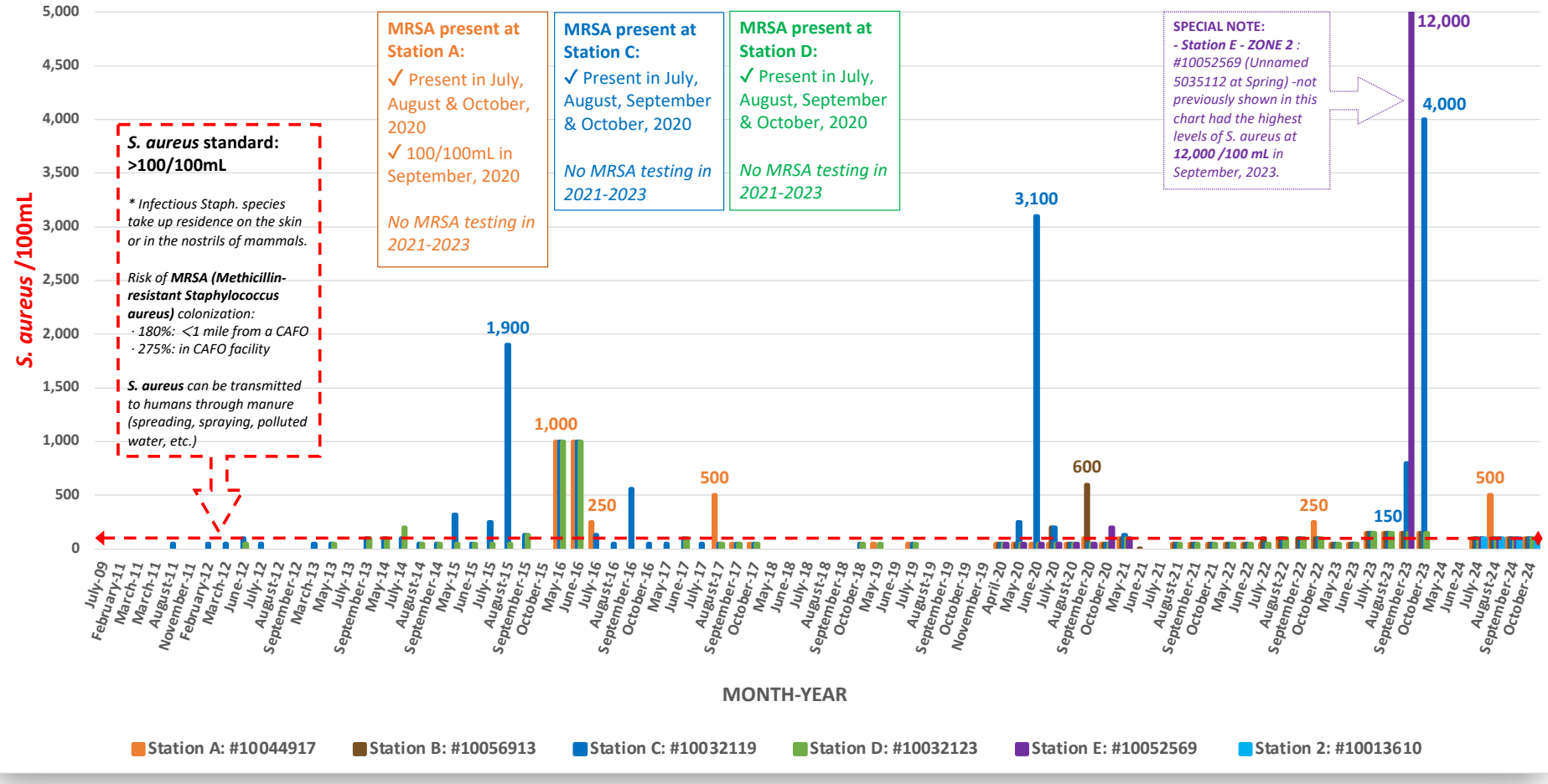
SPECIAL NOTE:
- Station E - ZONE 2 *: #10052569 (Unnamed 5035112 at Spring) -not previously shown in this chart had the highest levels of S. aureus at* ***12,000 /100 mL*** *in September, 2023.*

***S. aureus* standard: >100/100mL**

** Infectious Staph. species take up residence on the skin or in the nostrils of mammals.*

Risk of ***MRSA (Methicillin-resistant Staphylococcus aureus)*** *colonization:*
· 180%: <1 mile from a CAFO
· 275%: in CAFO facility

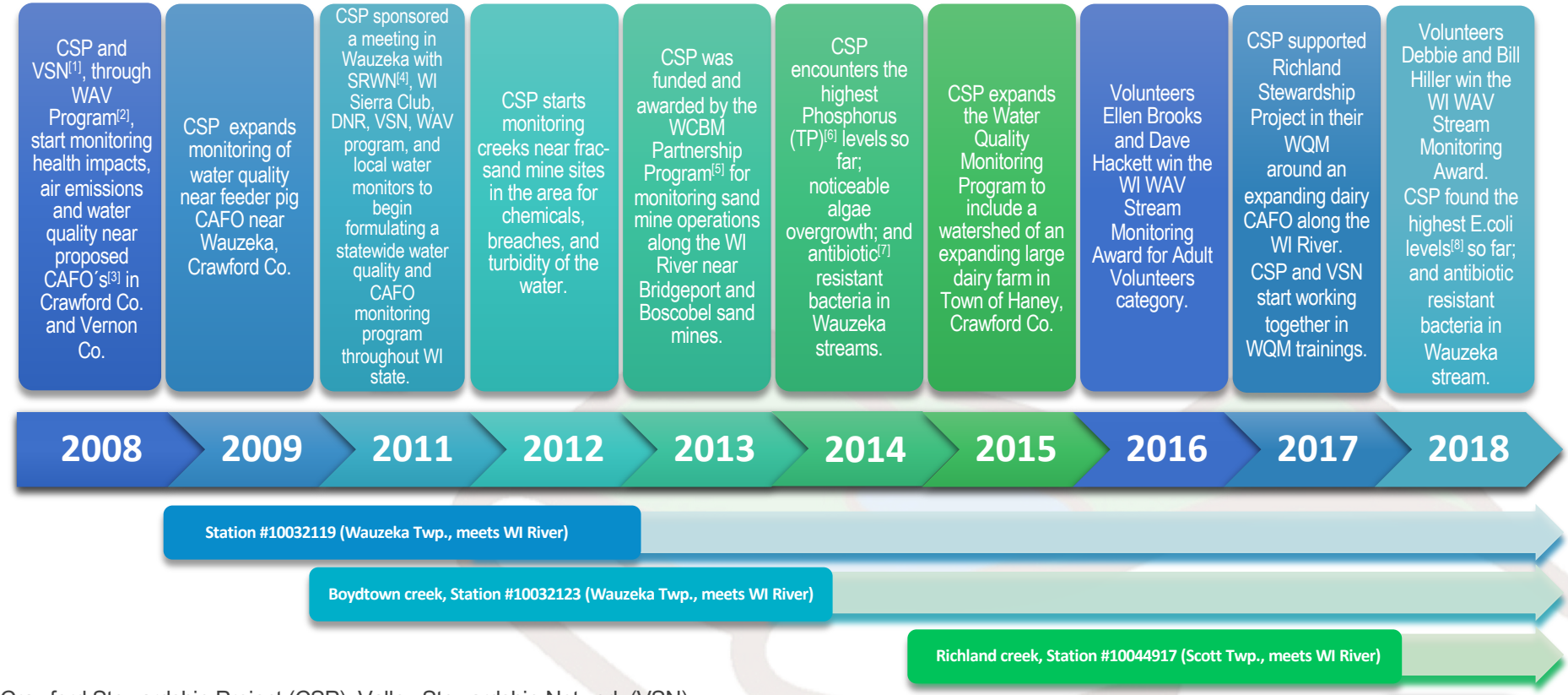
S. aureus *can be transmitted to humans through manure (spreading, spraying, polluted water, etc.)*



SOME REFERENCES

- CSP Surface Water Monitoring Program: https://www.crawfordstewardship.org/surfacewater/
- The Phosphorus Rule: https://dnr.wisconsin.gov/sites/default/files/topic/Wastewater/TP_factsheet4162013.pdf
- Water Condition Lists: https://dnr.wisconsin.gov/topic/SurfaceWater/ConditionLists.html
- Water Condition Viewer: https://dnrmaps.wi.gov/H5/?viewer=Water_Condition_Viewer
- Impaired Water Search: https://apps.dnr.wi.gov/water/impairedSearch.aspx
- CSP Regional Karst Geology Viewer: https://karstology.crawfordstewardship.org/#/0/43.2217/center/-90.9201,43.2222

WATER QUALITY MONITORING (WQM) PROGRAM TIMELINE 2008 - 2018



[1] Crawford Stewardship Project (CSP); Valley Stewardship Network (VSN)

[2] Water Action Volunteers (WAV), coordinated through a partnership between the University of Wisconsin Cooperative Extension and the WI Department of Natural Resources (DNR)

[3] Concentrated animal feeding operation (CAFO)

[4] Sustain Rural Wisconsin Network (SRWN)

[5] Wisconsin Citizen Based Monitoring Partnership Program (WCBM)

[6] Total Phosphorus (TP) = 1.3 mg/L and *E.coli* = 10,000 cfu/100 mL (Station #10032119); ***Total Phosphorus standard: 0.075 mg/L***

[7] Chloramphenicol: an antibiotic banned or restricted in U.S. meat. Can cause plasmatic anemia in humans.

[8] *E. coli* = 82,000 cfu/100 mL (Station #10032123) and 19,000 cfu/100 mL (Station #10044917); ***E. coli standard: 126 cfu/mL***

WATER QUALITY MONITORING (WQM) PROGRAM TIMELINE 2019 - 2023

2019
Four more sites of concern were added into the WQM Program.

Results reached new records of *E. coli* and Phosphorus (TP) levels[9] .

2020
Results reached new records of backgroud bacteria[10], *Staphylococcus aureus* (*S. aureus*) and MRSA (Methicillin-resistant *S. aureus*) levels[11] .

2021
A group of students completes their 1st WQM season at one site next to the North Crawford District School. The Swamp Project People achieves the 1st water quality restoration assessment of Myrtle Lake at Soldiers Grove.

2022
The WI WAV Stream Monitoring Award in the "Adult Volunteer" category was given to CSP volunteers, Kathy (also a former CSP Board member and staff) & Paul Byrne.

2023
Results reached new records of *S. aureus* and Fungi levels[12].

Began monitoring Station 1 (10044131) for TP by request of the WI DNR.

2024
Began monitoring Stations 2 (10013610) as a site of concern; and 3 & 4, (10029558 & 10009025) for TP by request of the WI DNR.

Station #10044131
(Scott Twp., meets WI River)

Station #10013610
(Wauzeka Twp., meets WI River)

Station #10029558
(Wauzeka Twp., meets WI River)

Station #10009025
(Eastman Twp, meet Kickapoo Riv.)

Sites of concern:

A. **Richland creek, Station #10044917 (Scott Twp., meets WI River)**
B. **Shaw Hollow creek, Station # 10056913 (Haney Twp., meets Kickapoo River)**
C. **Station #10032119 (Wauzeka Twp., meets WI River)**
D. **Boydtown creek, Station #10032123 (Wauzeka Twp., meets WI River)**
E. **Spring, Station #10052569 (Wauzeka Twp., meets WI River)**
   2. **Boydtown creek, Station #10013610 (Wauzeka Twp., meets WI River)**
F. **Station #10052670 (Marietta Twp., meets Kickapoo River)**
G. **Station #10052671 (Marietta Twp., meets Kickapoo River)**

[9] *E. coli* = 170,000 = cfu/100 mL (Station #10032123); and, Total Phosphorus (TP) = 4.22 mg/L (Station # 10052671)
[10] Background Bacteria = 500,000,000/100 mL (Station # 10052671); ***High Background Bacteria: 50,000/100mL***
[11] *S. aureus* = 3,100/100 mL (Station #10032119); and, MRSA = 100/100 mL (Station #10044917); ***S. aureus and MRSA standard: <100/100mL***
[12] *S. aureus* = 800/100 mL, and Fungi = >20,000/100 mL (Station #10032119); *S. aureus* = 12,000/100 mL, and Fungi = 36,000/100 mL (Station #10052569)