

WATER QUALITY MONITORING: UPPER BLANCO RIVER

Guadalupe Blanco River Authority
Clean Rivers Program Coordinated Monitoring Meeting
April 23, 2023



THE MEADOWS CENTER
FOR WATER AND THE ENVIRONMENT
TEXAS STATE UNIVERSITY



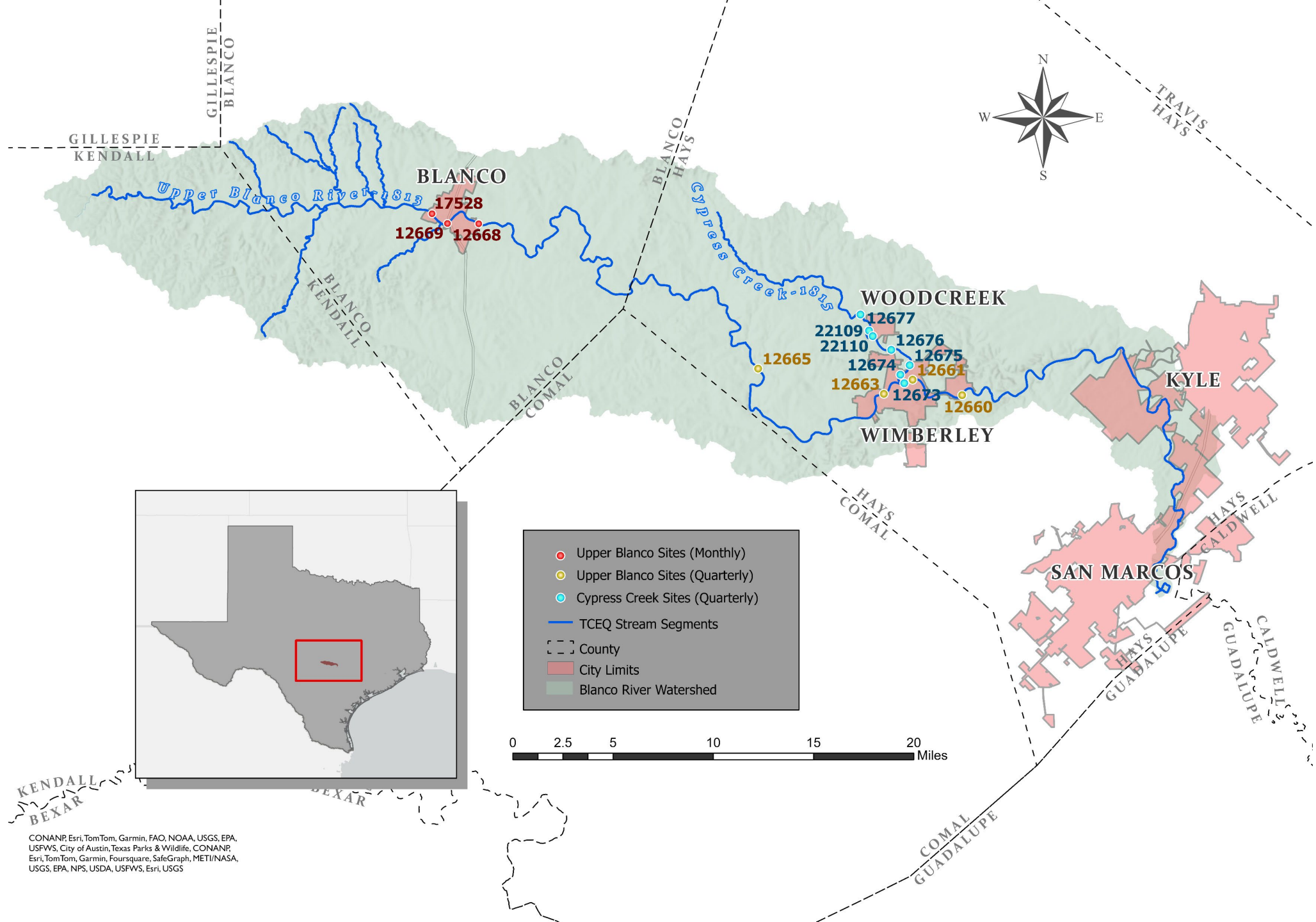
THE
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OVERVIEW

Routine Water Quality Monitoring:

- Upper Blanco River **monthly** monitoring (Segment 1813) at 3 sites
- Upper Blanco River **quarterly** monitoring (Segment 1813) at 4 sites
- Cypress Creek **quarterly** monitoring (Segment 1815) at 6 sites





Upper Blanco River

Monthly Monitoring

Sep 2019 – March 2024

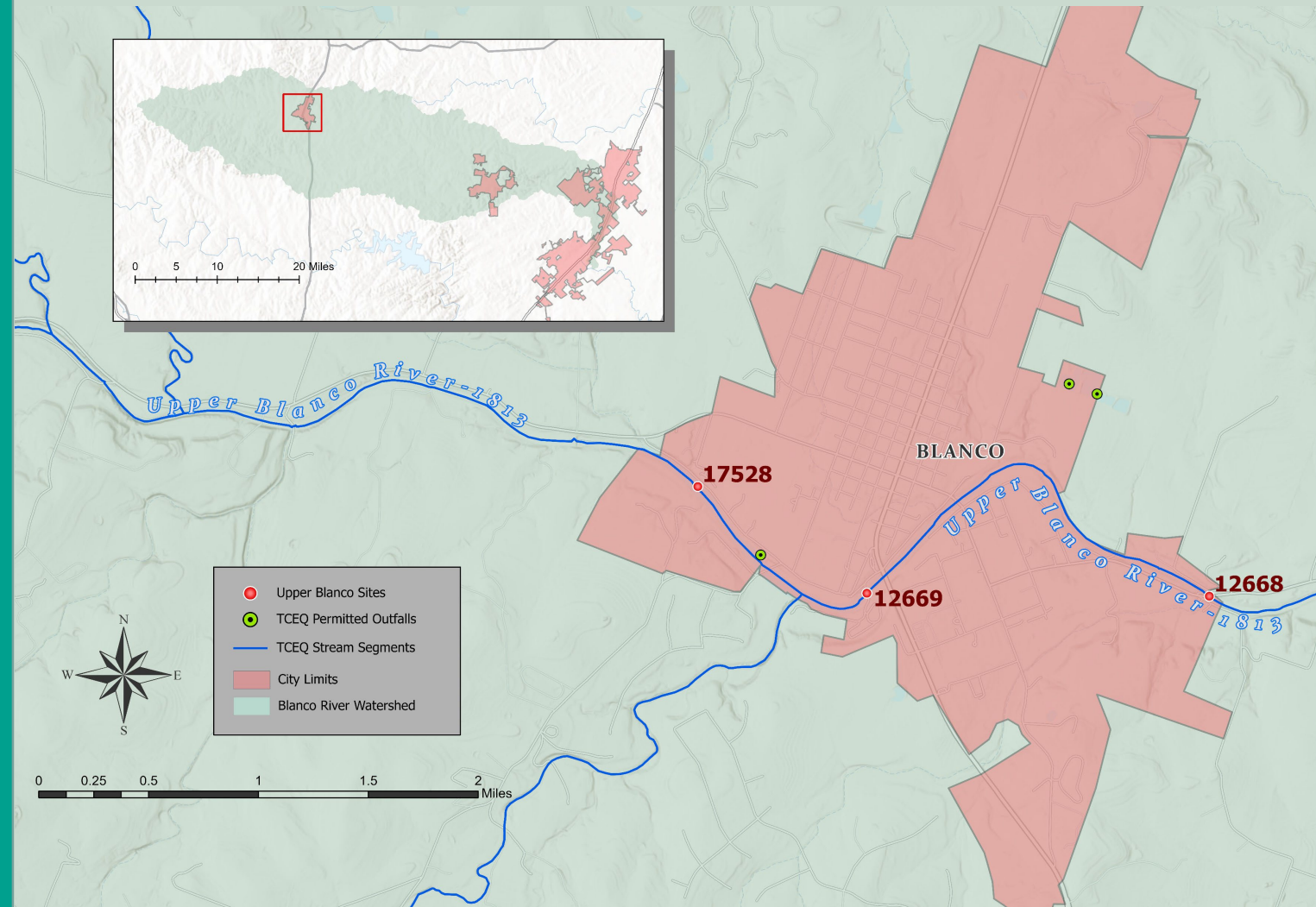
Purpose: To monitor water quality due to concerns resulting from wastewater treatment plant discharge.

Three locations:

- 17528 – Upstream of Pany Dr.
(added in September 2022)
- 12669 – Blanco River @ PR23
- 12668 – Blanco River @ FM165

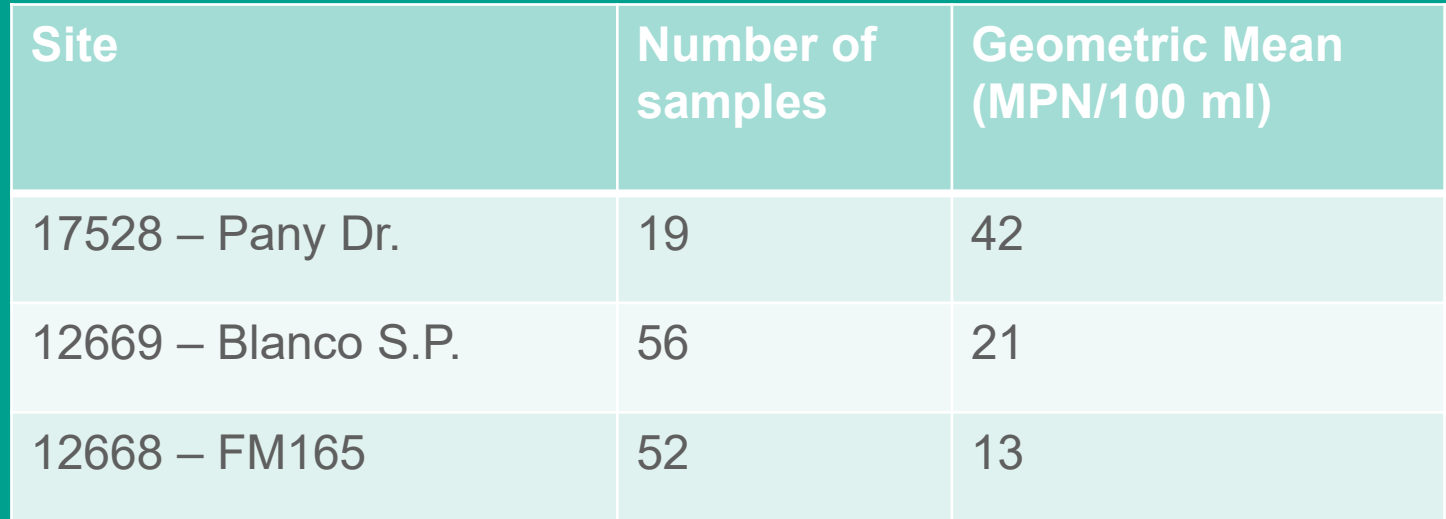
Parameters:

Flow
Field
Conventional
E. coli Bacteria



Monthly Monitoring Results (Sep 2019 – Mar 2024)

- WQS geomean met at all sites
- Some exceedances of single sample criterion



Upper Blanco River

Quarterly Monitoring

Mar 2019 – Mar 2023

Purpose: To collect water quality data for assessment in the Texas Integrated Report.

Four locations:

12665 – Blanco River @ Fischer Store Rd.

12663 – Blanco River @ Pioneer Town

12661 – Blanco River @ RR12

12660 – Blanco River @ CR174

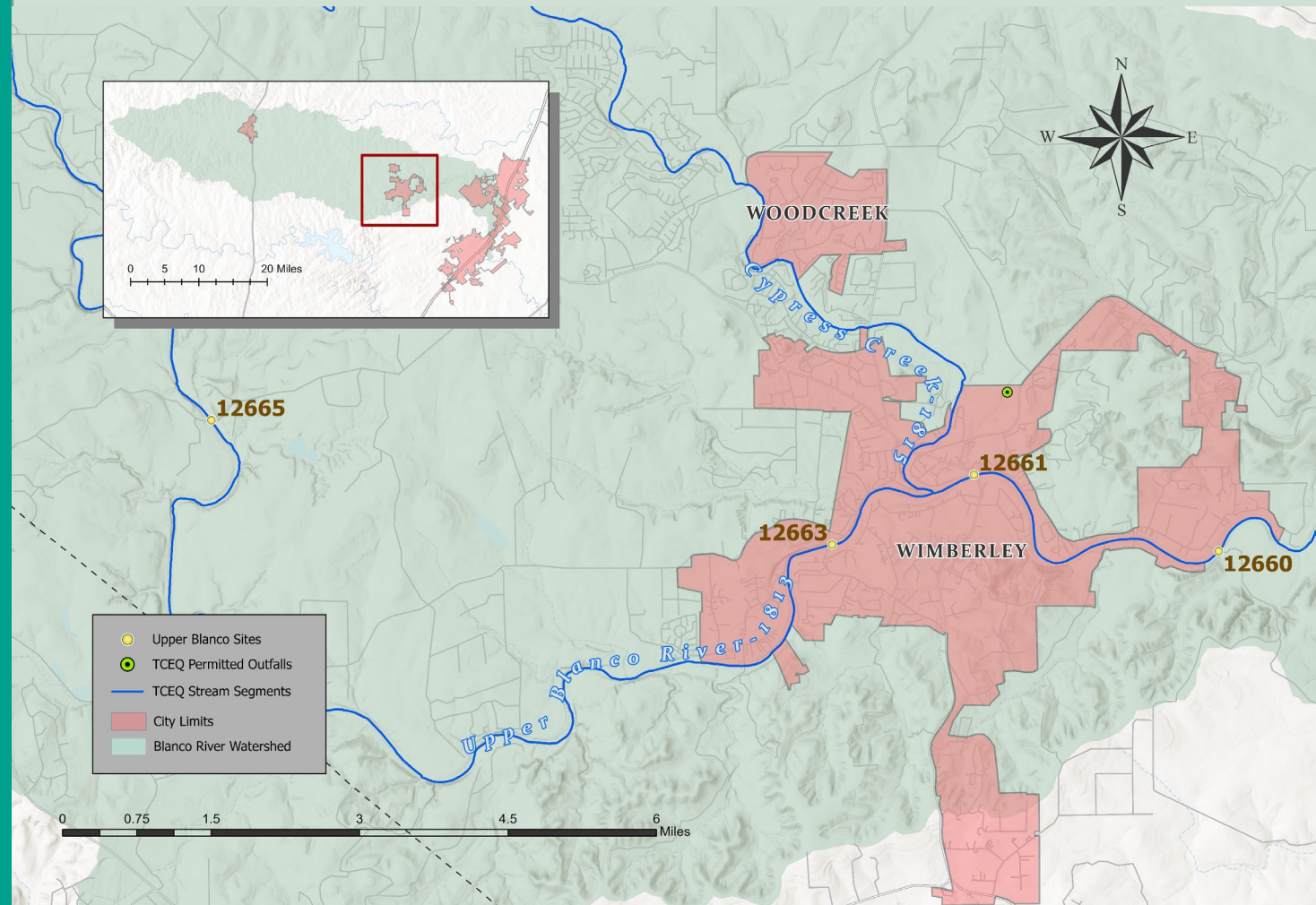
Parameters:

Flow

Field

Conventional

Bacteria

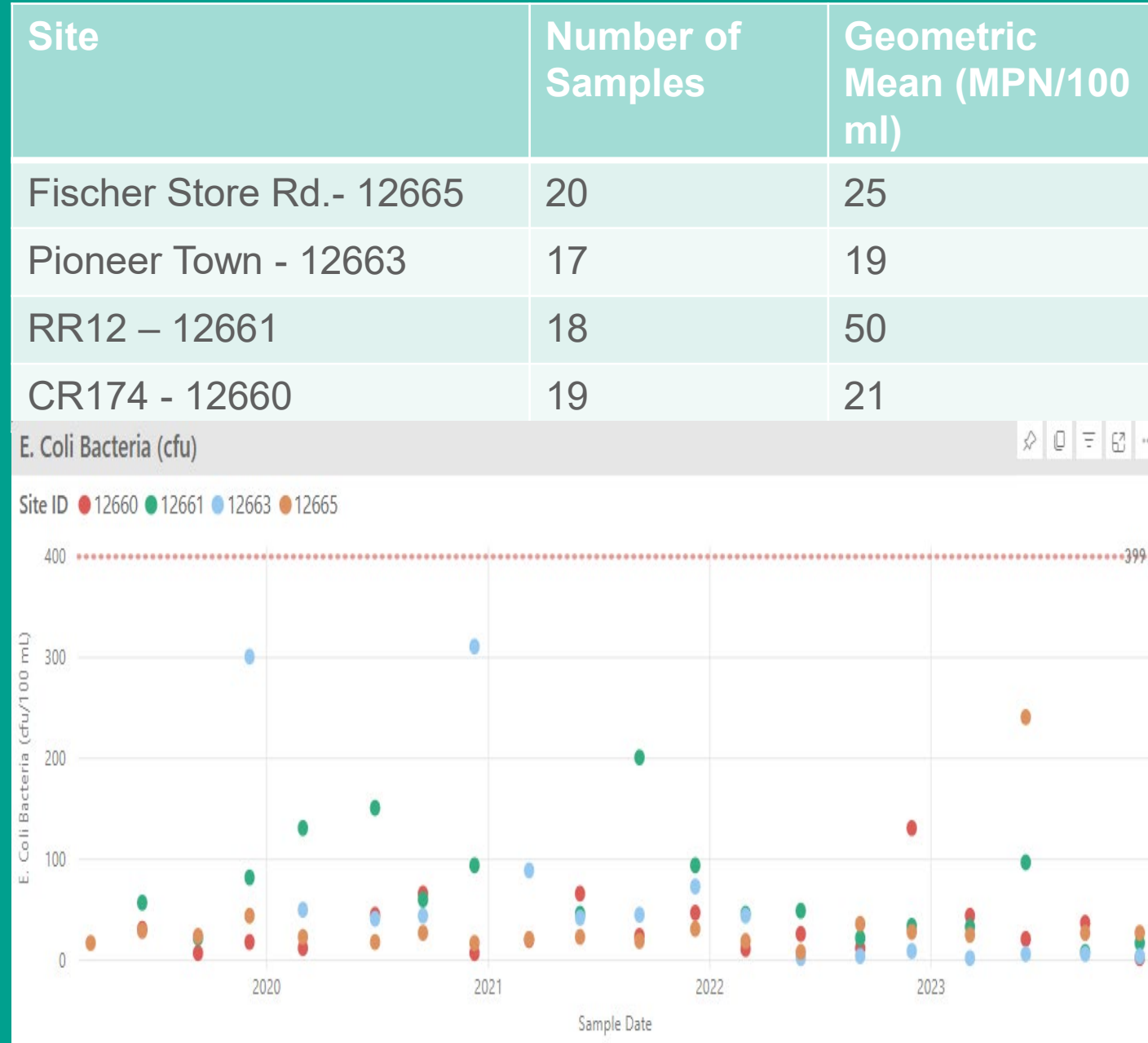


Upper Blanco River

Quarterly Monitoring Results (Mar 2019 – Dec 2023)

E. coli bacteria

- Geomean below WQS (126 MPN/100 mL) at all sites
- All samples/sites had values below the single sample criterion (399 MPN/100 ml)
- Higher geometric mean in urbanized area near RR12 downstream of Cypress Creek confluence



Cypress Creek

Quarterly Monitoring

Purpose: To collect water quality data in support of the WPP.

Six locations:

- 12677 – CC @ Jacob's Well
- 22109 – CC @ Camp Young Judea
- 22110 – CC @ Woodcreek Dr.
- 12676 – CC @ RR12
- 12675 – CC @ Blue Hole*
- 12674 – CC @ FM12 in Wimberley
- 12673 – CC @ Blanco Riv. Confluence*

Parameters:

Field

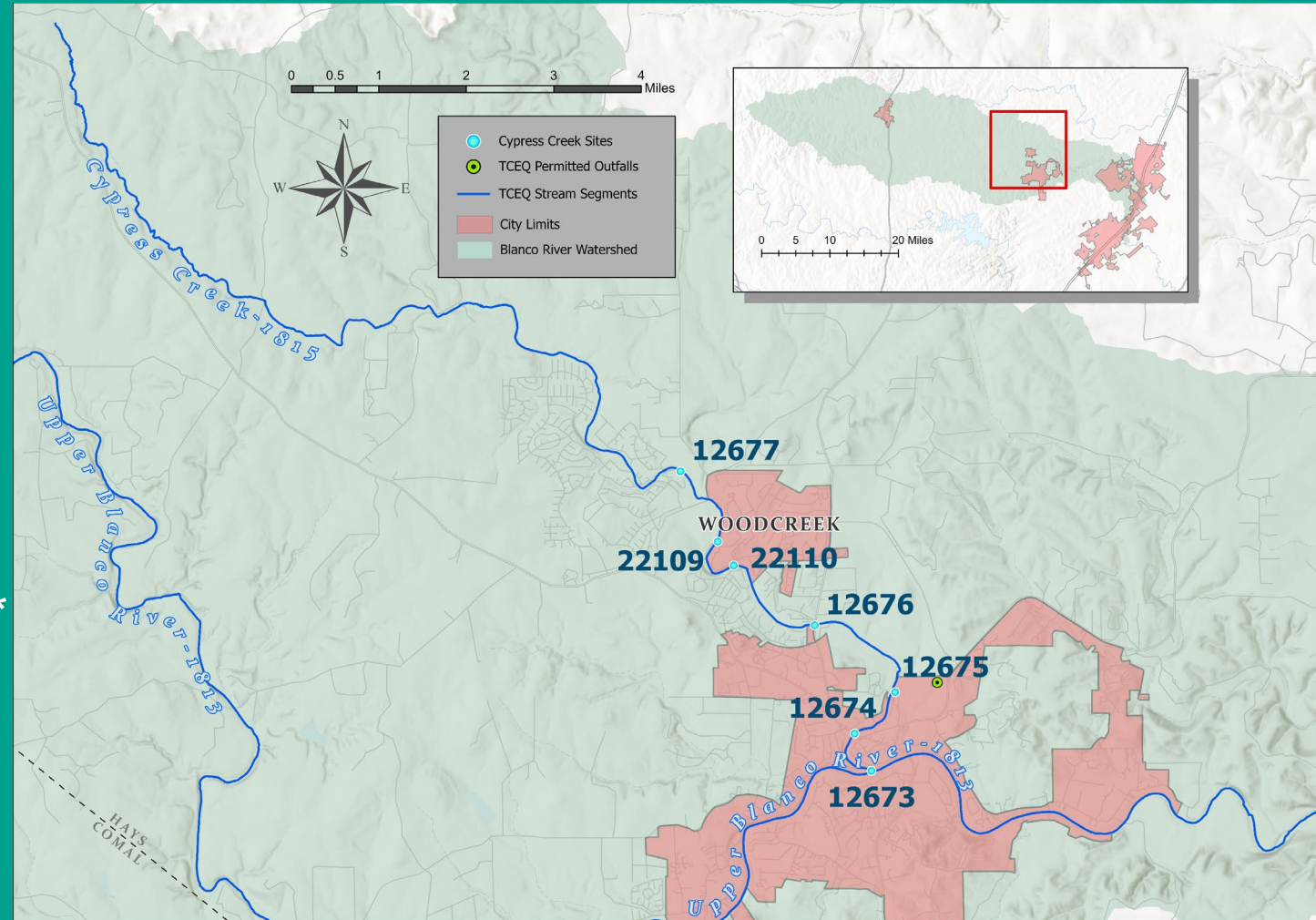
Conventionals

24-hour DO (*)

Flow

E. coli Bacteria

Groundwater wells



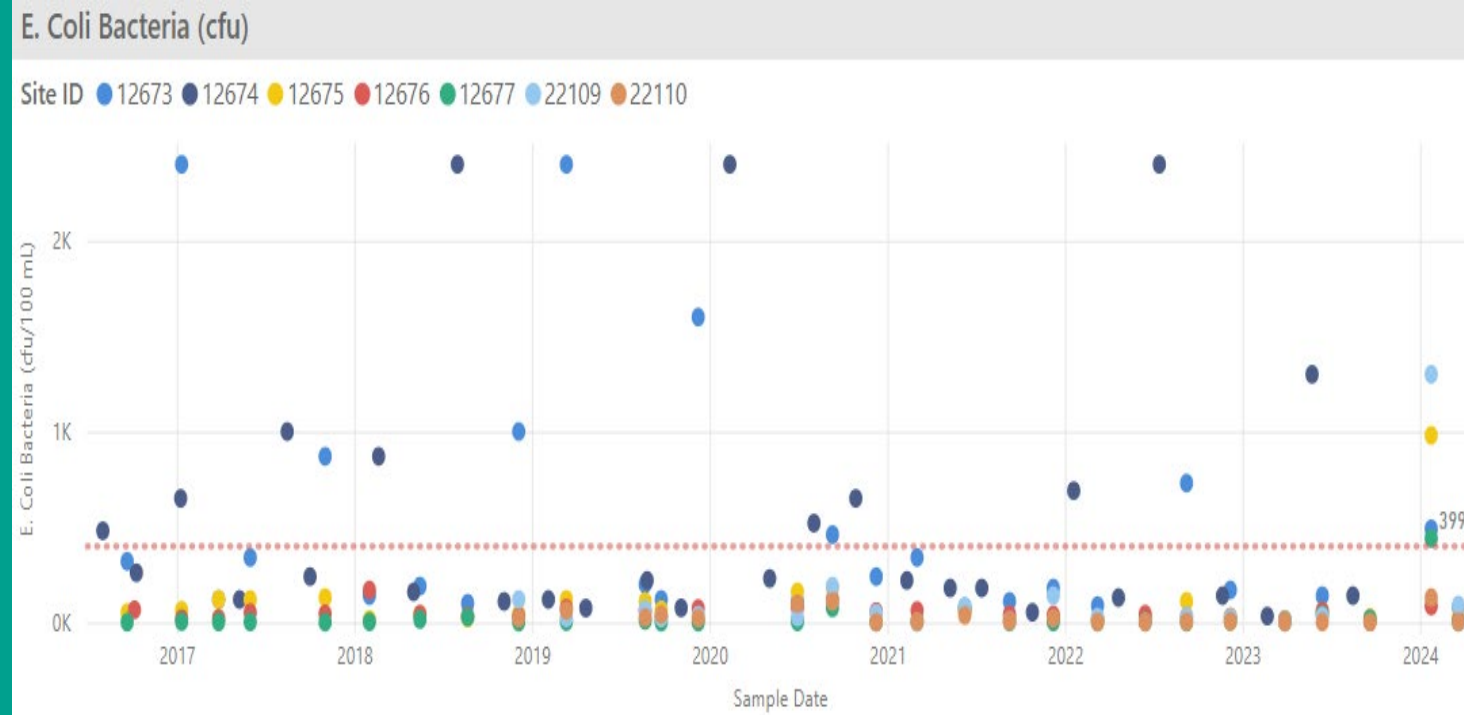
Cypress Creek

Quarterly Monitoring Results (Sep. 2016-Mar 2024)

E. coli (MPN/100 mL)

- Geometric means below WQS (126 MPN/100 mL) at all sites except:
 - RR12 at Wimberley
 - Blanco River Confluence
- Single sample criterion(399 MPN/100 mL) exceeded at:
 - RR12 at Wimberley
 - Blanco River Confluence
 - Blue Hole
 - Jacob's Well

Site	Number of Samples	Geometric Mean (MPN/100 mL)
Jacob's Well - 12677	29	4
Camp Young Judea- 22109	20	31
Woodcreek Dr. - 22110	21	10
RR12 at Cottages - 12676	29	39
Blue Hole - 12675	29	47
RR12 at Wimberley - 12674	29	286*
Blanco River Confluence - 12673	29	218*



Lower Cypress Creek Dye Trace Study

(December 2023)

- **Purpose:** To determine if OSSFs are source of *E. coli* bacteria.
- Fluorescein dye deposited in Ozona Motor Bank OSSF July 12, 2023.
- Conducted background monitoring and post-dye deployment monitoring through October 25, 2023 at 6 sites
- Parameters monitored:
 - Dye in water and on charcoal filters
 - *E. coli* bacteria
 - Field parameters
 - Fluorometric measurements



Lower Cypress Creek Dye Trace Study

(December 2023)

Sample Collection Date	Days since last rainfall (rainfall accumulation in.)	80443	80926	81663	81658	81652	81651
		Upstream RR12	Downstream RR12	Wimberley Spring	Wimberley Stream	Downstream Wimberley Stream	Most Downstream Site
7/5/2023 (Filter deployment only)	3 (0.01)	-	-	-	-	-	-
7/12/2023	6 (0.25)	ND	ND	ND	ND	ND	ND
7/14/2023	8 (0)	ND	ND	ND	-	ND	ND
7/17/2023	11 (0)	POS	ND	ND	ND	ND	ND
7/19/2023	12(0)	ND	POS*	ND	-	ND	POS
7/26/2023	3 (0.01)	ND	POS	ND	-	ND	ND
8/2/2023	10 (0)	ND	-	ND	-	ND	ND
8/9/2023	17 (0)	-	-	ND	-	ND	ND
8/16/2023	24 (0)	ND	-	ND	-	ND	ND
8/23/2023	1 (0.11)	ND	-	ND	ND	ND	ND
9/20/2023	4 (0.29)	ND	ND	ND	ND	ND	ND
10/3/2020 (Filter deployment only)	8 (0.17)	-	-	-	-	-	-
10/10/2023	5 (1.29)	POS	ND	ND	ND	-	ND

Lower Cypress Creek Dye Trace Study

(December 2023)

Parameter	80443 CC - Upstream RR12	80926 CC- Downstream RR12	81663 Wimberley Spring	81658 Wimberley Stream	81652 CC - Downstream Wimberley Stream	81651 CC - Most Downstream Site
Number of Measurements	10	3	10	1	9	10
E. coli (CFU/100 ml)	40 (499)	1501 (1,033)	573 (2,966)	1500 (0)	19 (472)	39 (5,649)
Dissolved Oxygen (mg/l)	3.0±1 (2.7)	4.4±1.8 (3.2)	2.5±1.1 (3.3)	3.2 (0)	2.0±0.7 (1.9)	2.7±1.5 (4.0)
Specific Conductance (µS/cm)	784±170 (645)	764±50 (95)	791±188 (734)	370 (0)	813±209 (910)	733±219 (983)
*Total Dissolved Solids (mg/l)	510±111 (419)	496±32 (62)	514±122 (477)	241 (0)	529±136 (592)	477±142 (639)
pH (s.u.)	7.6±0.2 (0.6)	7.9±0.1 (0.2)	7.1±0.3 (0.8)	7.5 (0)	7.4±0.2 (0.7)	7.5±0.2 (0.8)
Water Temperature (°C)	25.5±2.8 (8)	26.5±1.0 (2)	24.5±1.7 (6.3)	23.1 (0)	24.4±1.8 (5.2)	24.5±2.3 (7.9)
Air Temperature (°C)	25.7±2.8 (7)	26.5±2.4 (6)	25.2±2.7 (7)	26.5±2.1 (5)	24.8±2.3 (6)	24±1.6 (5)
Fluorometry Exposure Experiment Ratios <1.5	33% (4:12)	50% (2:4)	25% (3:12)	0% (0:1)	50% (6:12)	58% (7:12)

Summary

Upper Blanco River – Monthly Monitoring

- Low/no flows (< 10 cfs) since July 2022
- TDS exceeds WQS under low/no flow conditions
- Water temperature standard exceeded Aug 2023
- Dissolved oxygen < 6.0 mg/L April 2023
- pH measurements at or > 9.0 s.u.
- Reported WWTP discharges affect nutrients
- FM165 shows signs of nutrient enrichment
- E. coli single sample criterion exceeded but geometric means met WQS

Summary

Upper Blanco River – Quarterly Monitoring

- Low flows since Sep 2022
- E. coli bacteria are slightly higher in more urbanized areas
- Dissolved oxygen values appear stable
- TDS values approaching WQS at Fischer Store Rd.

Cypress Creek

- Dissolved oxygen values concern (grab and 24-hour)
- E. coli bacteria values exceed WQS geomean downstream of RR12
- Sources of bacteria during the dry conditions exhibited during the dye trace study were predominantly from bat colony and nonpoint source runoff

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