



SAN ANTONIO
RIVER AUTHORITY

Leaders in Watershed Solutions

Mid/Lower Cibolo Creek Monitoring

January 18, 2018

INSPIRING ACTIONS FOR HEALTHY CREEKS & RIVERS

Segment vs. Assessment Unit

- Basin – 19
- Segment – 13 segments, 01-13
- Assessment Unit (AU) – between 1 and 9 per segment



Segment vs. AU



Mid Cibolo Creek – 1913_03



Lower Cibolo Creek – 1902_03



Segment Definitions

- Mid Cibolo Creek
 - 100 meters downstream IH-10 in Bexar County to RR bridge W of Bracken in Comal County
 - 3 AU's
- Lower Cibolo Creek
 - SAR confluence to 100 meters downstream IH-10 in Bexar County
 - 5 AU's

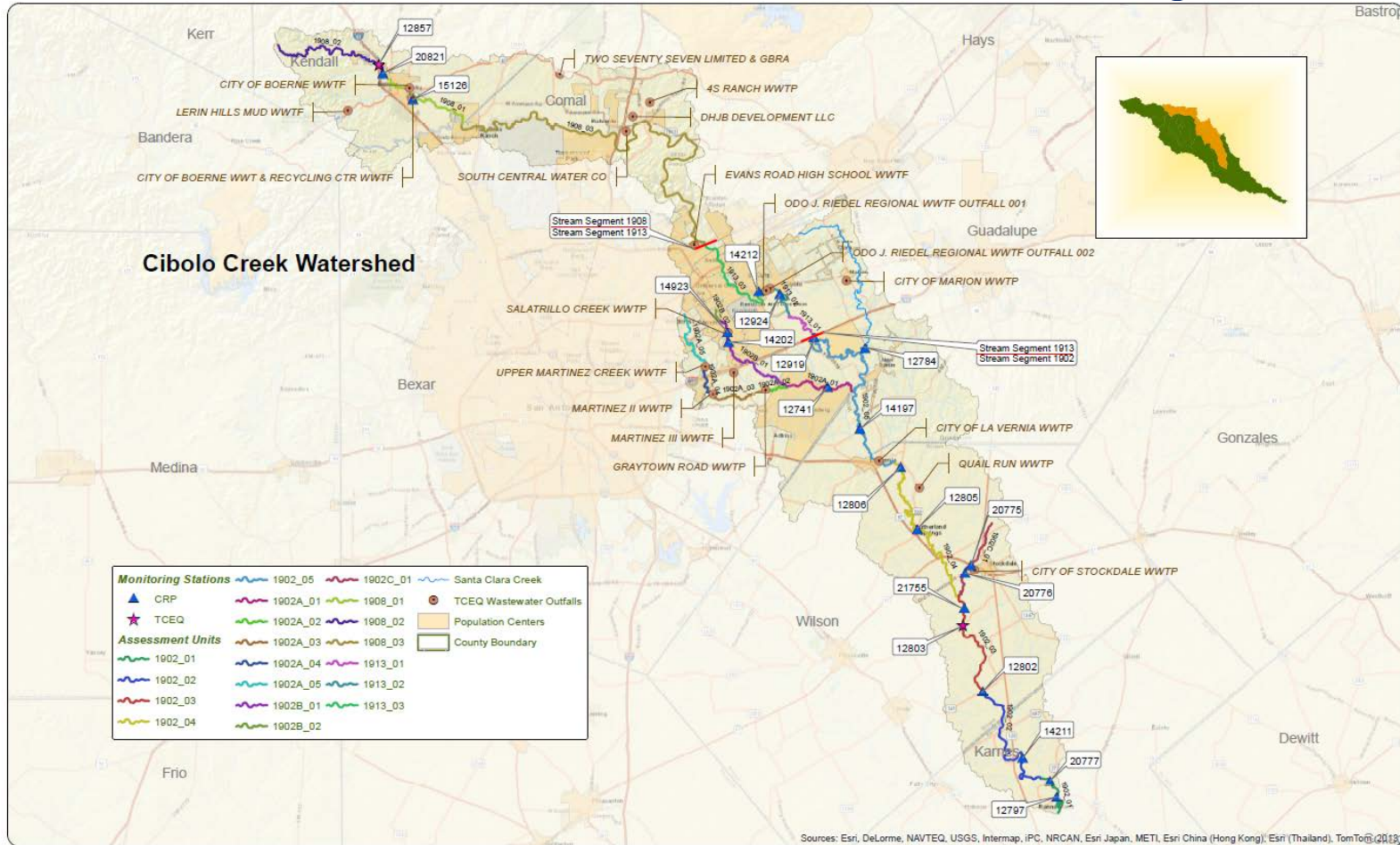


2017 Surface Water Quality Standards Revision

- Mid Cibolo Creek (typically dry)
 - FM 78 in Bexar/Guadalupe to Balcones Creek confluence in Kendall/Bexar
- Lower Cibolo Creek
 - SAR confluence to FM 78 in Bexar/Guadalupe



Routine Water Quality



Routine Water Quality

- Field Parameters – DO, temp, pH & conductivity
- Field Observations – recreation, wildlife, weather, etc.
- Conventional – nitrate, nitrite, sulfate, phosphate, TKN, TSS, *E. coli*, etc.
- Nutrients – Chlorophyll-a & Pheophytin



Mid Cibolo Creek

AU	Station ID	Station Description	<i>E. Coli</i> Geomean
1913_03	TCEQ_14212	Cibolo Creek Upstream CCMA WWTP	93.11
1913_02	TCEQ_12924	Cibolo Creek at Schaefer Rd	69.88
1913_01	TCEQ_12919	Cibolo Creek 40 m Downstream IH-10	116.01

***E. Coli* Primary Contact Recreation Criteria – 126 cfu/100 mL**

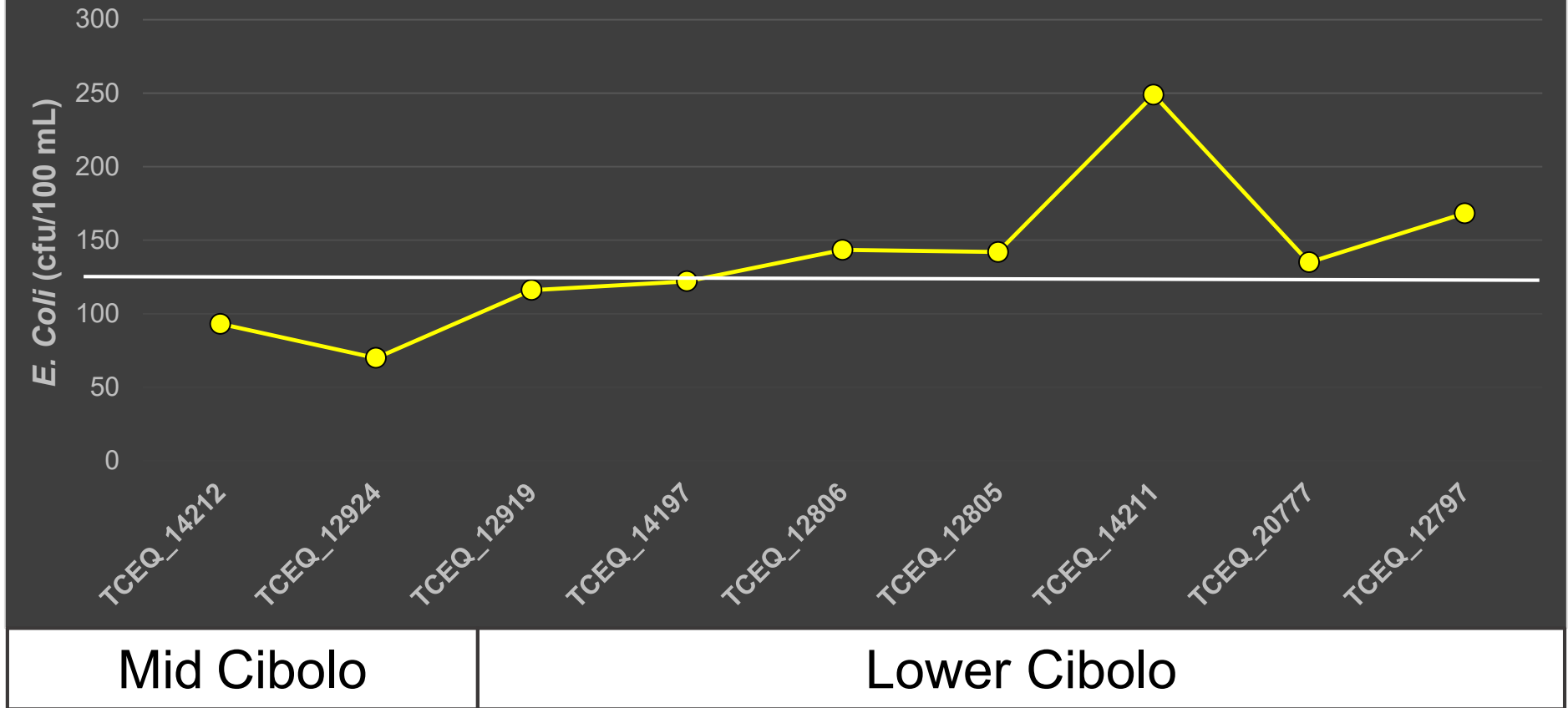


Lower Cibolo Creek

Assessment Unit	Station ID	Station Description	<i>E. Coli</i> Geomean
1902_05	TCEQ_14197	Cibolo Creek at Scull Crossing	122.04
1902_04	TCEQ_12806	Cibolo Creek at CR 337	143.36
1902_04	TCEQ_12805	Cibolo Creek at FM 539	141.89
1902_02	TCEQ_14211	Cibolo Creek at CR 389	248.87
1902_01	TCEQ_20777	Cibolo Creek at FM 2724	134.95
1902_01	TCEQ_12797	Cibolo Creek at FM 81	168.24



E. Coli Geomean



Upstream  Downstream



Lower Cibolo Creek Tributaries

Assessment Unit	Station ID	Station Description	<i>E. Coli</i> Geomean
1902A_01	TCEQ_12741	Martinez Creek on North Gable Rd	497.96
1902B_01	TCEQ_14202	Salatrillo Creek at Autumn Run	296.91
1902B_01*	TCEQ_14923	SARA Salatrillo WWTP ¹	5.93
1902C_01	TCEQ_20775	Clifton Branch at SH 97	220.31
1902C_01	TCEQ_20776	Clifton Branch at CR 401	134.63
1902*	TCEQ_12784	Santa Clara Creek Northwest of New Berlin ²	233.46

1 – Not an instream sample, taken directly from WWTP discharge

2 – Began sampling in 2016, proposed discharge permit for new WWTP



Mid Cibolo Creek

AU	Station ID	Station Description	Nitrate Average (mg/L)
1913_03	TCEQ_14212	Cibolo Creek Upstream CCMA WWTP	0.867
1913_02	TCEQ_12924	Cibolo Creek at Schaefer Rd	12.979
1913_01	TCEQ_12919	Cibolo Creek 40 m Downstream IH-10	9.501

Nitrate Screening Level – 1.95 mg/L

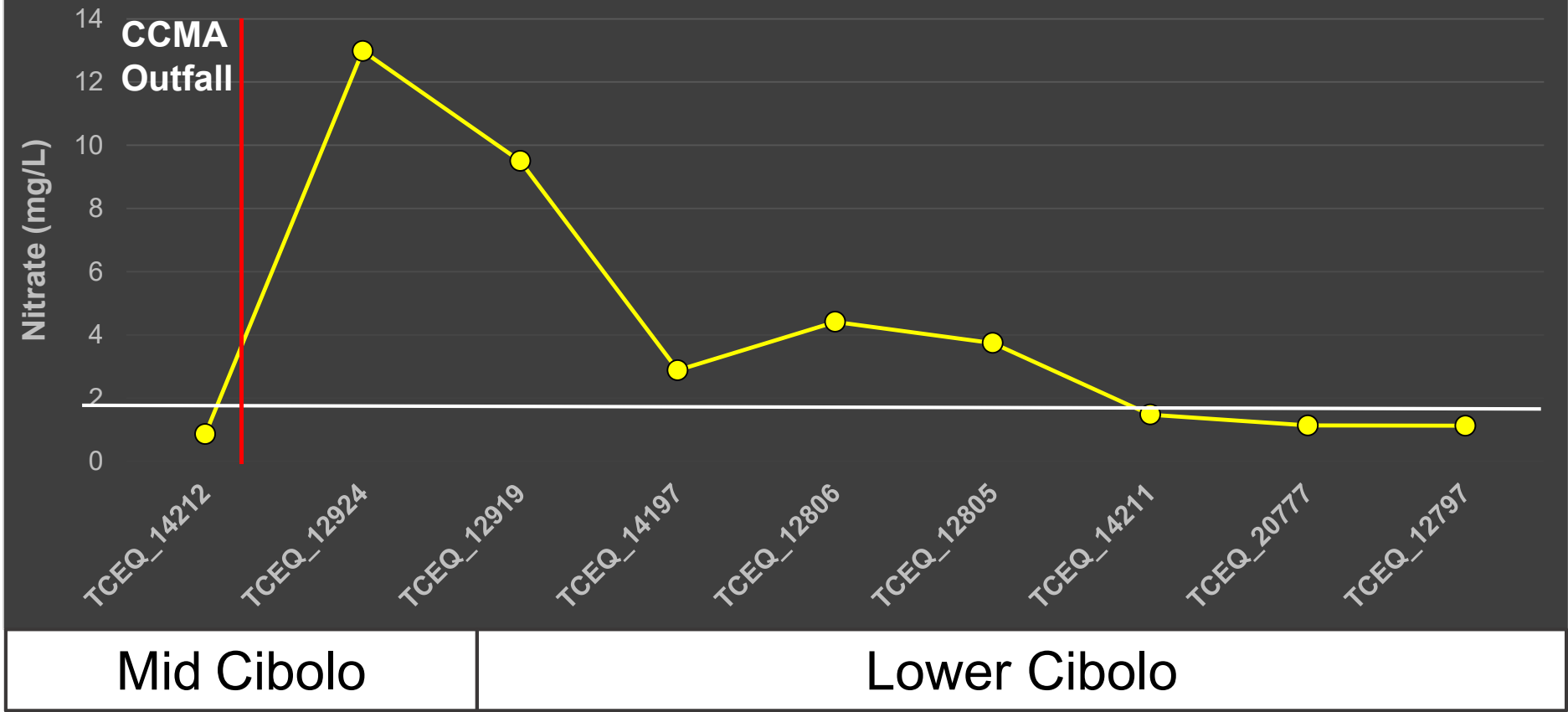


Lower Cibolo Creek

Assessment Unit	Station ID	Station Description	Nitrate Average (mg/L)
1902_05	TCEQ_14197	Cibolo Creek at Scull Crossing	2.887
1902_04	TCEQ_12806	Cibolo Creek at CR 337	4.417
1902_04	TCEQ_12805	Cibolo Creek at FM 539	3.746
1902_02	TCEQ_14211	Cibolo Creek at CR 389	1.482
1902_01	TCEQ_20777	Cibolo Creek at FM 2724	1.141
1902_01	TCEQ_12797	Cibolo Creek at FM 81	1.130



Nitrate Average



Upstream Downstream



Lower Cibolo Creek Tributaries

Assessment Unit	Station ID	Station Description	Nitrate Average (mg/L)
1902A_01	TCEQ_12741	Martinez Creek on North Gable Rd	1.241
1902B_01	TCEQ_14202	Salatrillo Creek at Autumn Run	3.257
1902B_01*	TCEQ_14923	SARA Salatrillo WWTP ¹	1.524
1902C_01	TCEQ_20775	Clifton Branch at SH 97	0.051
1902C_01	TCEQ_20776	Clifton Branch at CR 401	0.287
1902*	TCEQ_12784	Santa Clara Creek Northwest of New Berlin ²	1.555

1 – Not an instream sample, taken directly from WWTP discharge

2 – Began sampling in 2016, proposed discharge permit for new WWTP



Stormwater

- Automated samplers at three stations:
 - Cibolo Creek at IH-10 (TCEQ_12919) – 3 samples
 - Cibolo Creek at CR 337 (TCEQ_12806) – 2 samples
 - Cibolo Creek at FM 2724 (TCEQ_20777) – 2 samples



Stormwater



Sampling trigger of 1.5'
Minimum 0.5" of precipitation



**Cibolo Creek at CR 337
Frett Property**



Stormwater

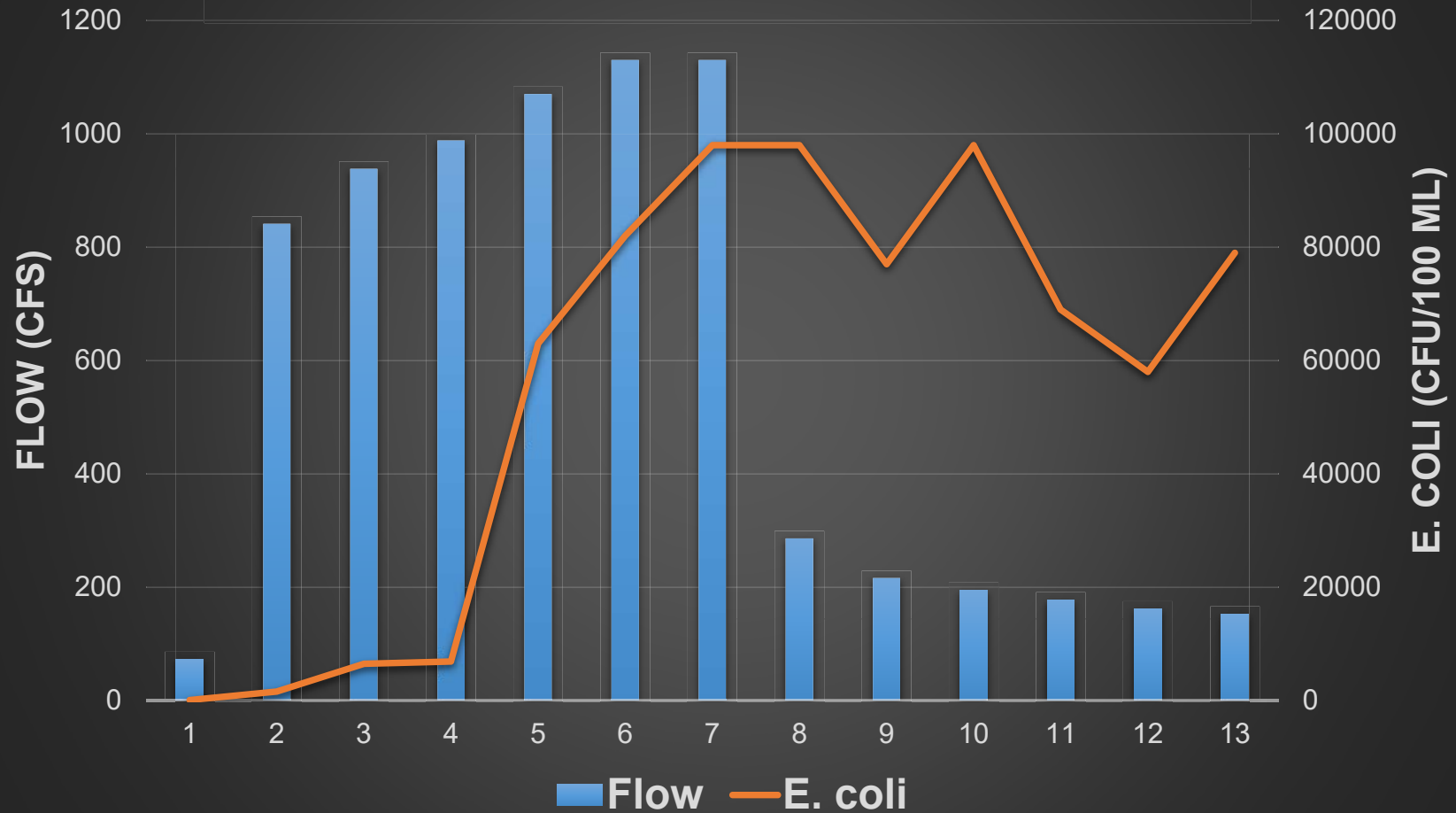
- Field Parameters
- Ammonia, nitrate, nitrite, phosphate, TKN, TSS, *E. coli*, etc.
- Metals and total hardness
- Precipitation accumulation



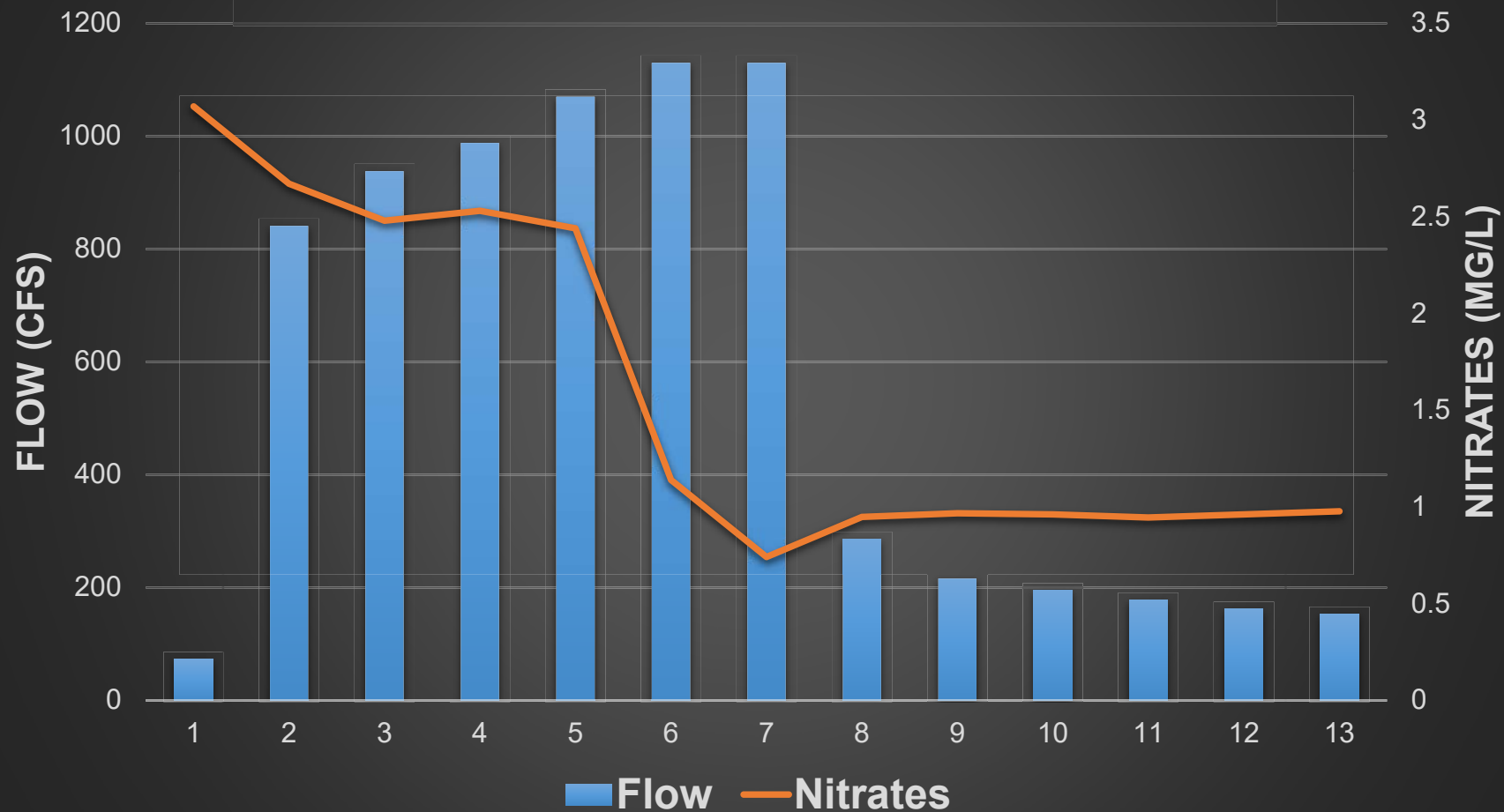
Cibolo Creek at IH-10



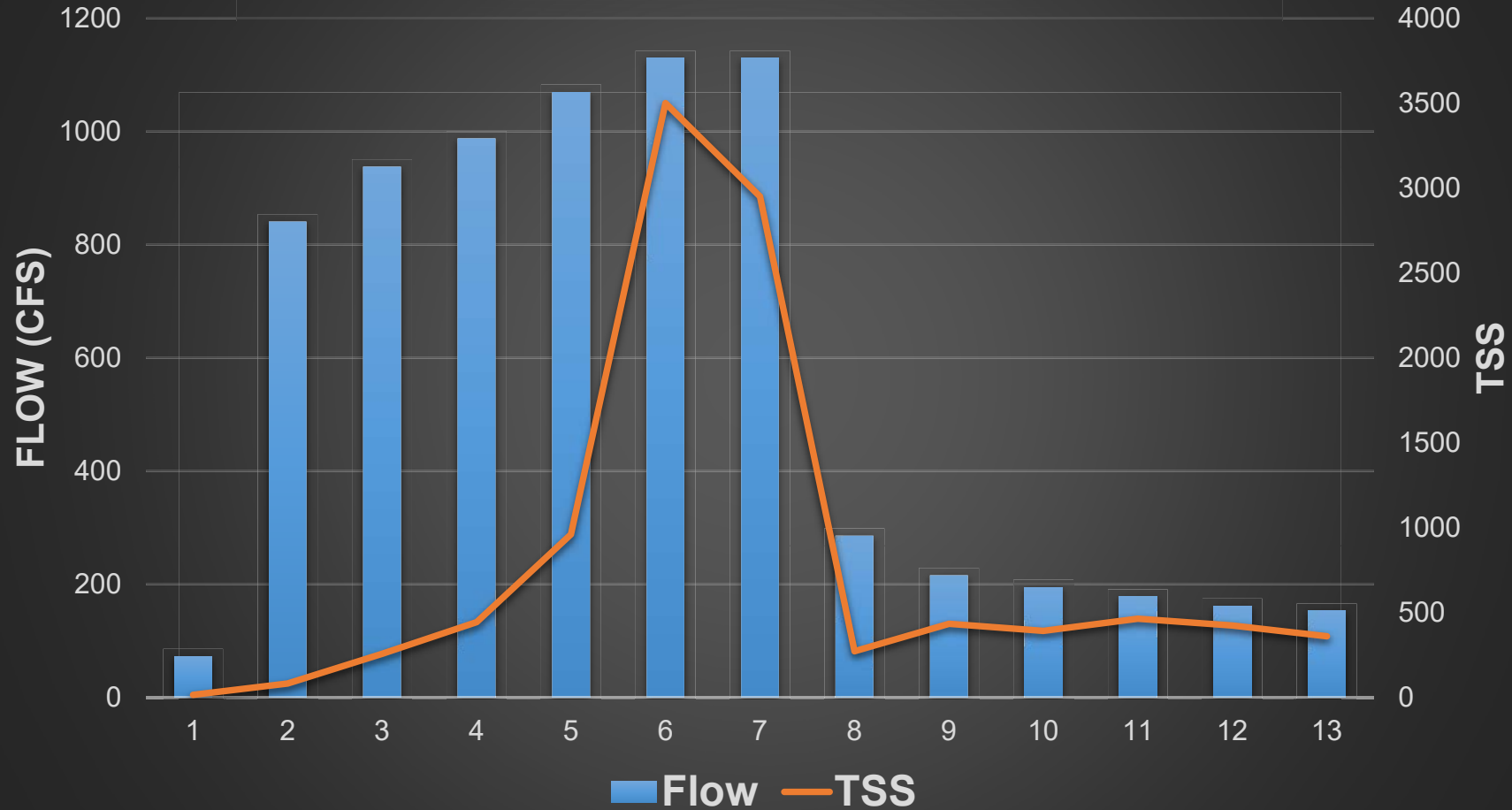
Cibolo Creek at FM 2724 April SW Event



Cibolo Creek at FM 2724 April SW Event



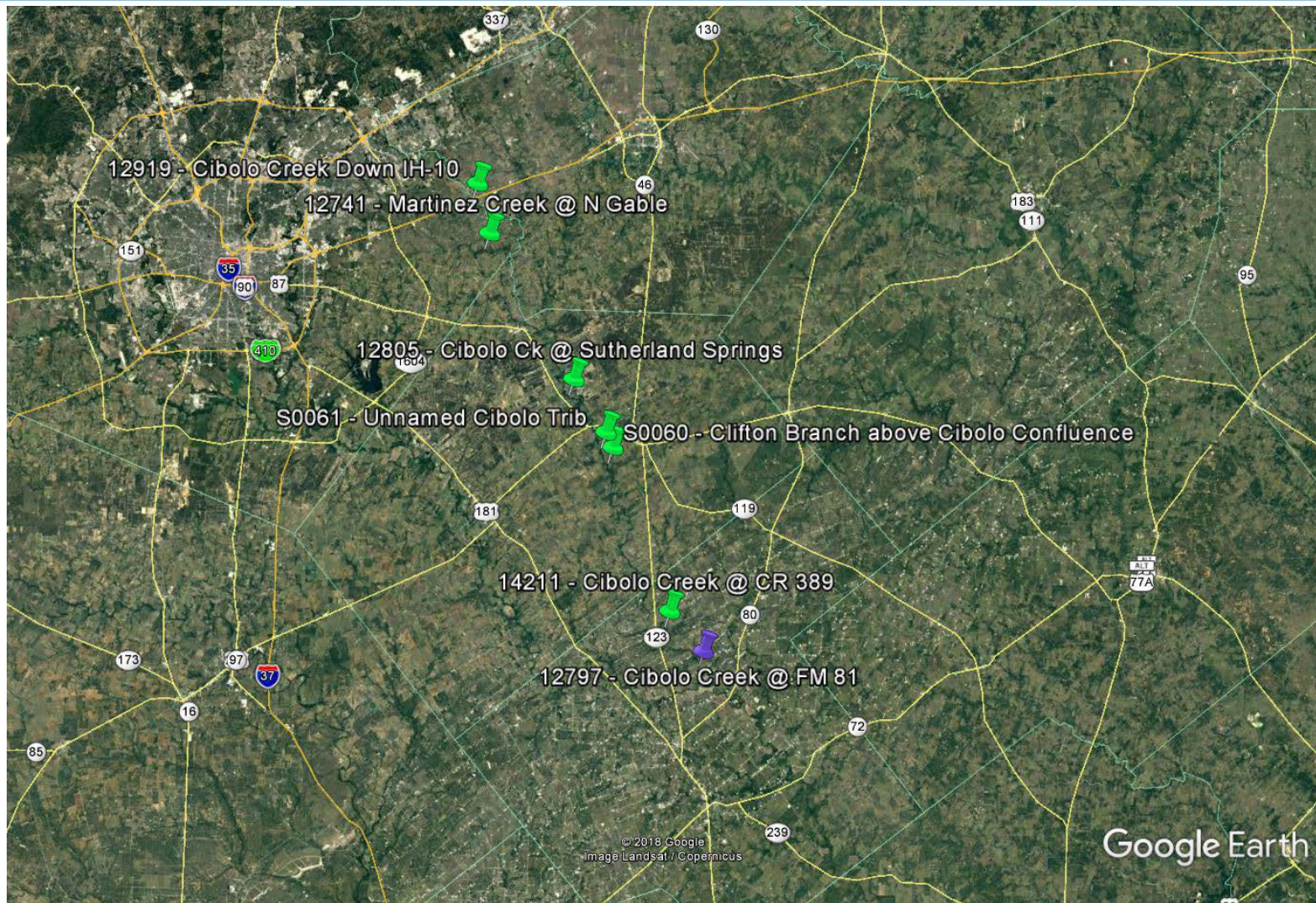
Cibolo Creek at FM 2724 April SW Event



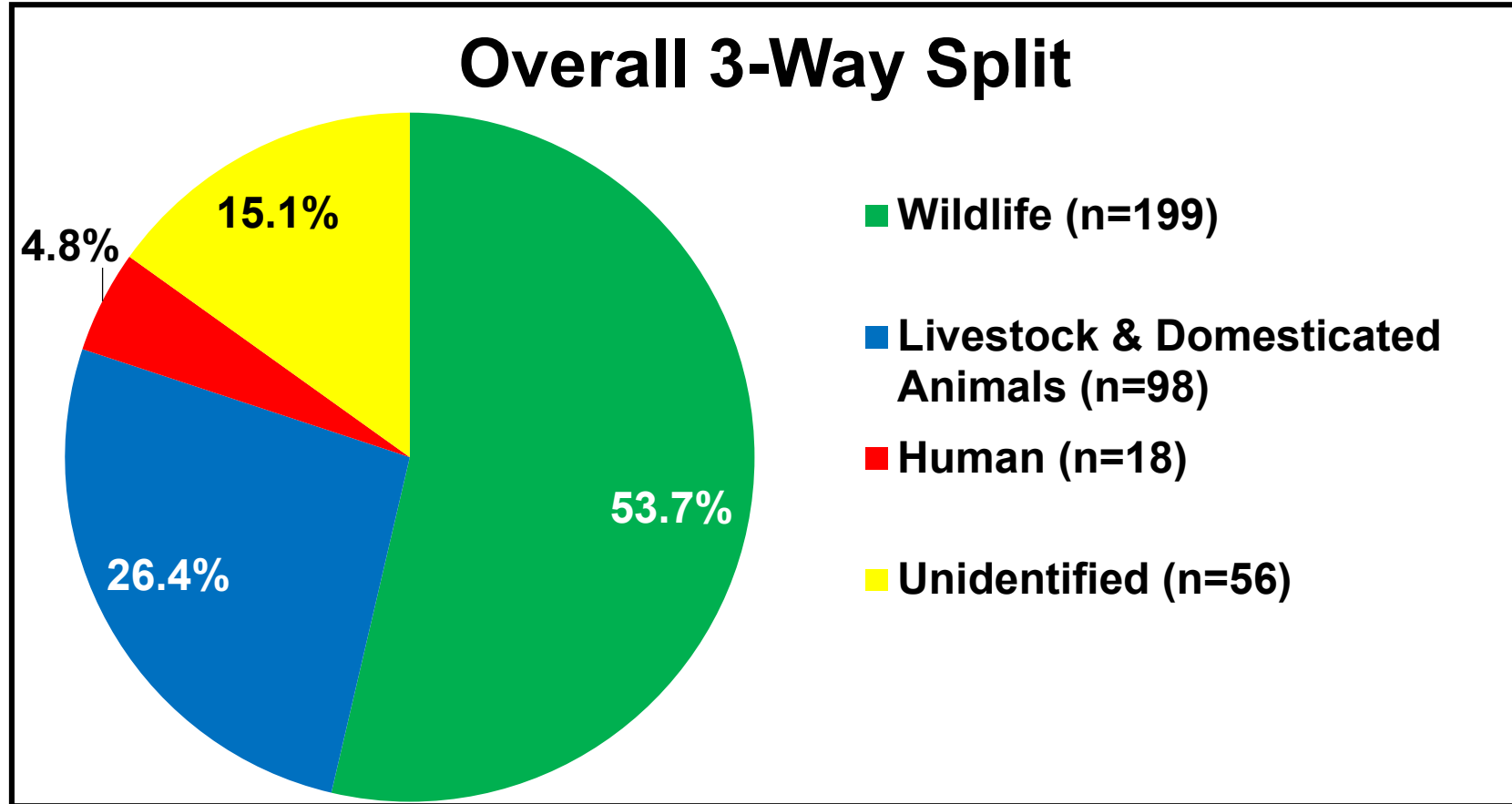
Bacterial Source Tracking

Station ID	Site Description	Seg/AU	County
Phase 1 – Lower San Antonio River & Tributaries			
TCEQ_12797	Cibolo Creek at FM 81	1902_01	Karnes
Phase 2 – Lower Cibolo Creek & Tributaries			
TCEQ_14211	Cibolo Creek at CR 389	1902_02	Karnes
SARA_S0060	Clifton Branch up Cibolo Confluence	1902C_01	Wilson
SARA_S0061	Unnamed Tributary up CR 401	1902	Wilson
TCEQ_12805	Cibolo Creek at FM 539	1902_03	Wilson
TCEQ_12741	Martinez Creek on N Gable Rd	1902A_01	Bexar
TCEQ_12919	Cibolo Creek down IH-10	1913_01	Bexar

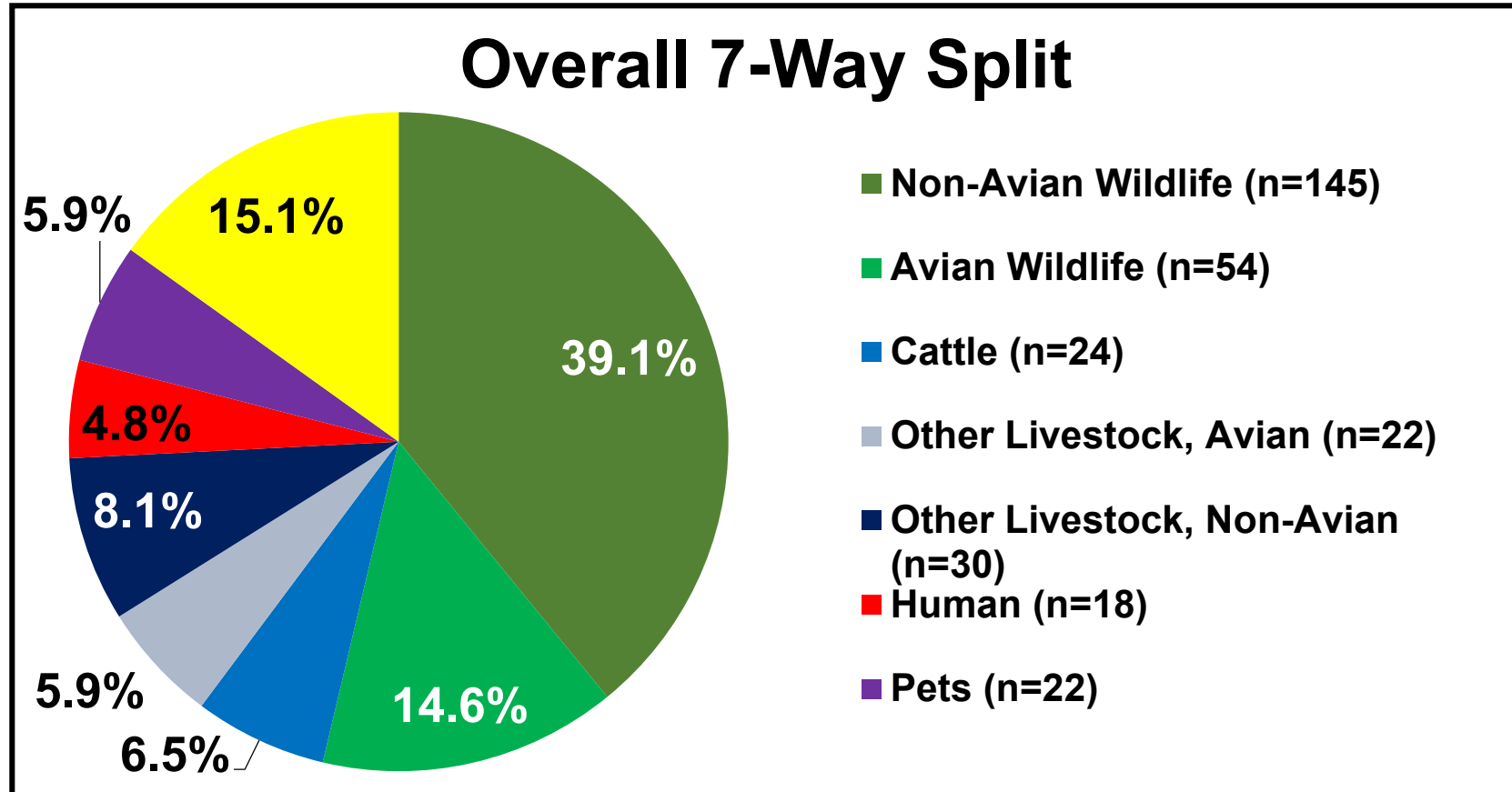




Bacterial Source Tracking

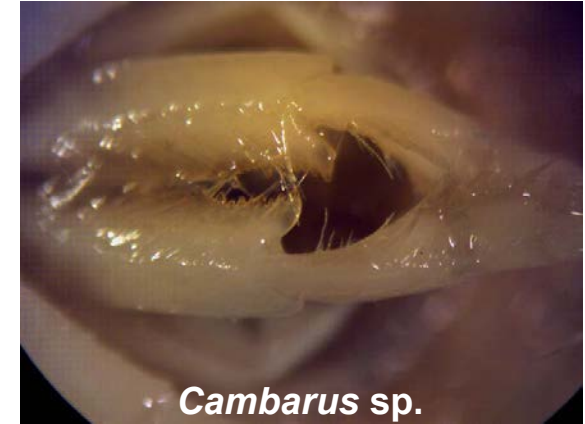


Bacterial Source Tracking



Biological Sampling

- Electrofishing
- Seining
- Benthic macroinvertebrates
- Habitat assessment



Index of Biotic Integrity (IBI)

- | | |
|-------------------------|-----------------------|
| 1. Total Sp. | 7. % Omnivores |
| 2. Native Cyprinids | 8. % Invertivores |
| 3. Benthic Invertivores | 9. % Piscivores |
| 4. Sunfish Sp. | 10. Total Individuals |
| 5. Intolerant Sp. | 11. % Non-natives |
| 6. % Tolerant Sp. | 12. % Diseased |

Scored 1-5, then totaled; used to assess Aquatic Life Use attainment.



Biological Sampling

Seg/AU	Station ID	Site Description	# of Samples	CV Adj. IBI	ALU Achieved
1902_05	TCEQ_14197	Cibolo Creek at Scull Crossing	3	43.85	High
1902_03	TCEQ_21755	Cibolo Creek 2.25 km up FM 537	2	42.34	High
	TCEQ_12802	Cibolo Creek at FM 541	2		
1902_02	TCEQ_14211	Cibolo Creek at CR 389	3	45.17	High



Spotted Bass – *Micropterus punctulatus*

Mimic Shiner – *Notropis volucellus*



Mussels

- Sampling from 10/14 to 8/15
- 81 individuals observed
- Five species observed



Golden Orb – *Quadrula aurea*



Yellow Sandshell – *Lampsilis teres*



Pistolgrip – *Quadrula verrucosa*



Questions?

