PETRONILA AND SAN FERNANDO WPP INTRODUCTION

Lucas Gregory – TWRI Assistant Director
Clare Escamilla – TWRI Research Specialist
Ennis Rios – TWRI Research Assistant
September 1, 2021

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Agenda

Petronila and San Fernando Creeks Watershed Planning Meeting

Wednesday, September 1, 2021

American Legion Post 185,

Bishop, TX

1:30 PM – 3:30 PM

1:30 – 1:40 **Welcome and Sign-In**

Texas Water Resources Institute

1:40 – 2:15 **Overview of WPP Chapters**

Ennis Rios, Texas Water Resources Institute

Lucas Gregory, Texas Water Resources Institute

2:15 – 2:30 **Review of Water Quality Management Plans**

Brian Koch, Texas State Soil and Water Conservation Board

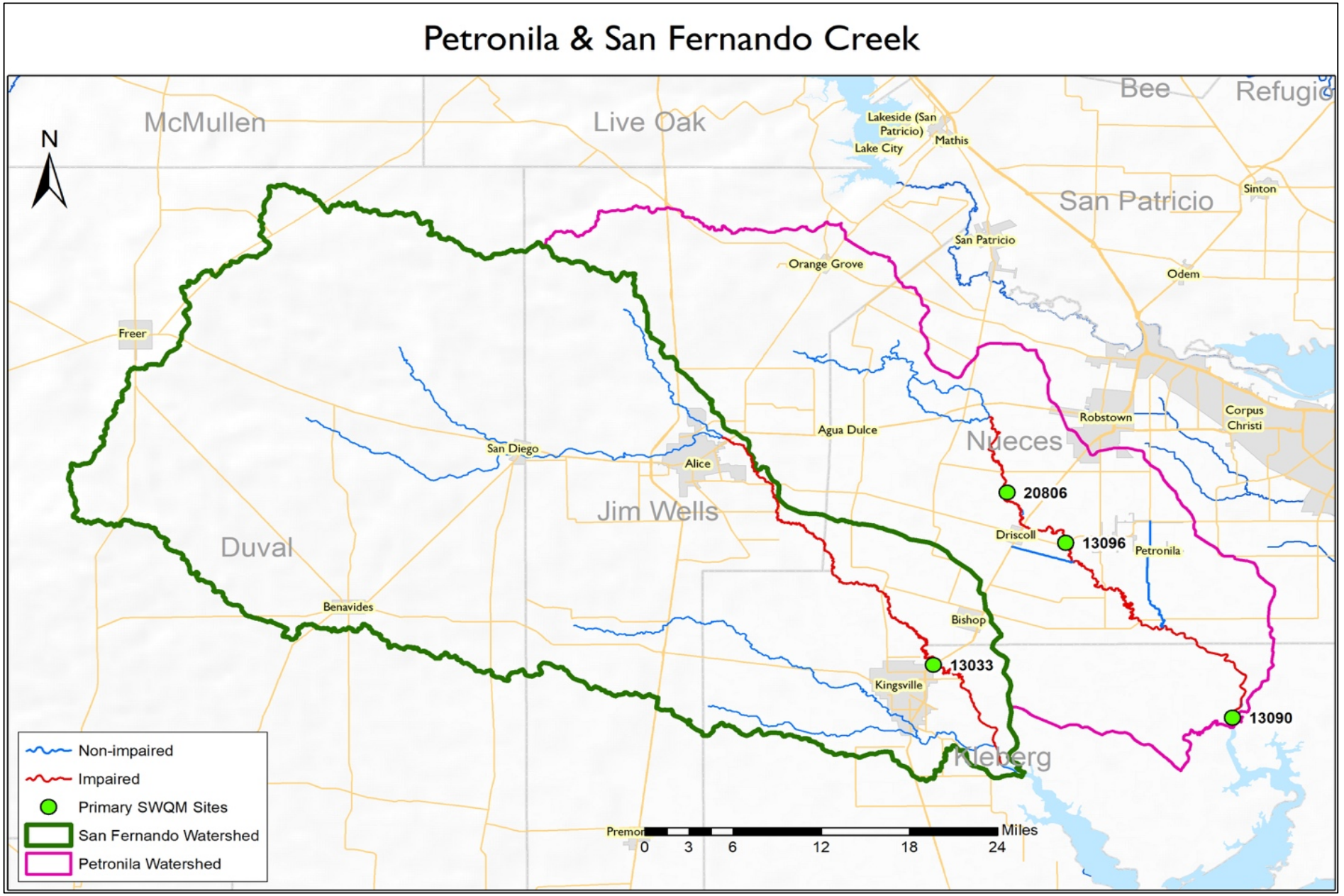
2:30 – 3:15 **Overview of Management Measures from Work Groups**

Lucas Gregory, Texas Water Resources Institute

Clare Escamilla, Texas Water Resources Institute

3:15 – 3:30 **Open Discussion and Questions**

Petronila & San Fernando Creek



CHAPTER 1: INTRODUCTION TO WATERSHED MANAGEMENT

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Watershed Protection Plan

- A holistic stakeholder driven plan that addresses water quality in a watershed rather than political subdivisions
- Addresses all impairments in a watershed
- A mechanism for voluntarily addressing complex water quality problems that cross multiple jurisdictions
- Provides a framework for coordinated implementation of prioritized and integrated protection and restoration strategies
- Integrates ongoing activities, prioritizes implementation projects based on technical merit and benefits to the community

Photo: Ed Rhodes

Watershed Protection Plan (WPP)

9 Key Elements of Successful WPPs

- Identify Causes and Sources
- Estimate Loading Reductions Needed
- Describe Management Measures
- Education and Outreach Component
- Schedule for Implementation
- Define Measurable Milestones
- Source of Financial Assistance and Estimate Costs
- Progress Indicators to Measure Reductions and Adaptive Management
- Monitoring to Evaluate Effectiveness

Adaptive Management and Education & Outreach

- As management measures recommended in a WPP are put into action, water quality and other measures of success will be monitored to make adjustments as needed to the implementation strategy.

- Education and outreach events provide the platform for the delivery of new and/or improved information to stakeholders through the WPP implementation process. Education and outreach efforts are integrated into many of the management measures that are detailed in this WPP.

CHAPTER 2: WATERSHED CHARACTERIZATION

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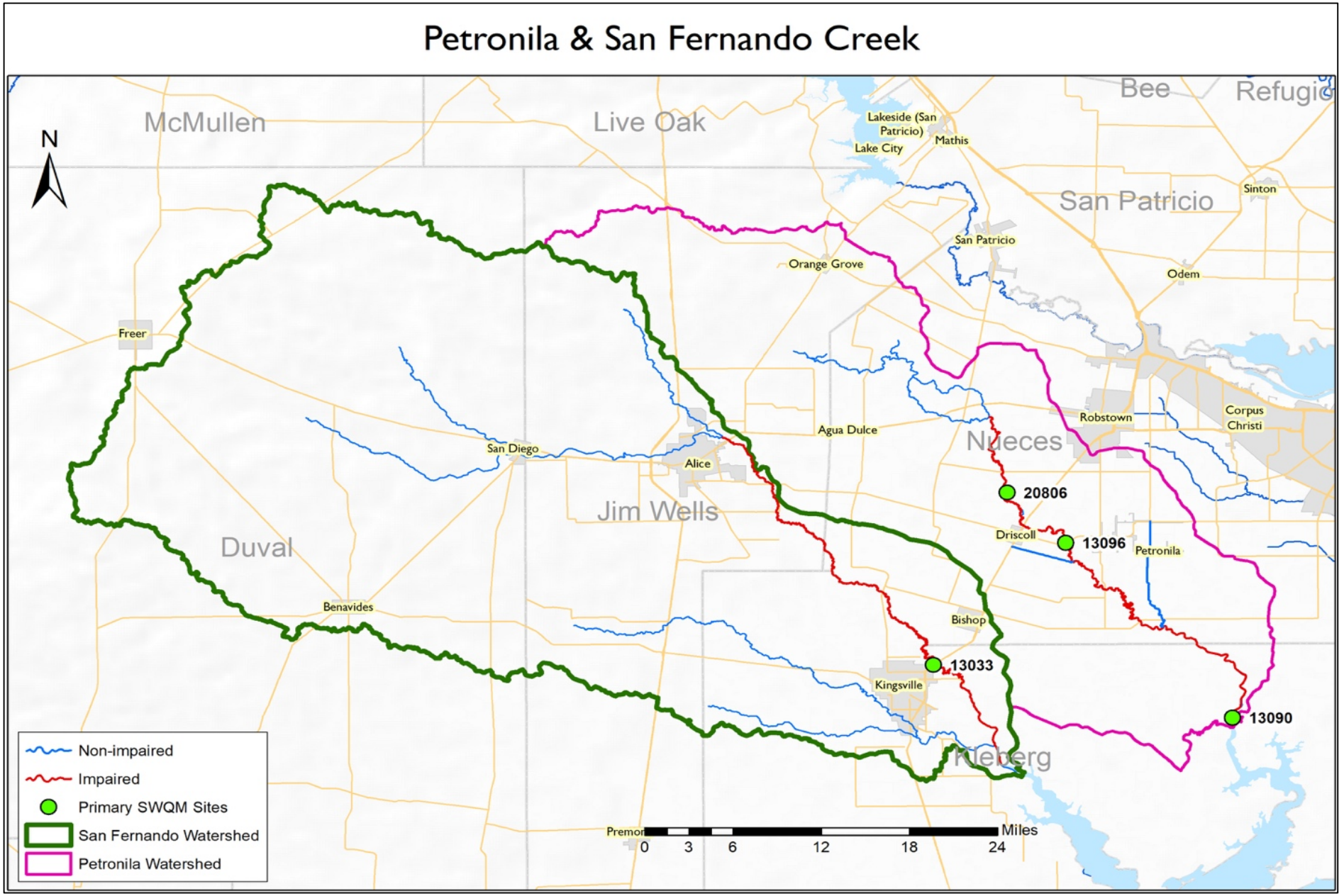
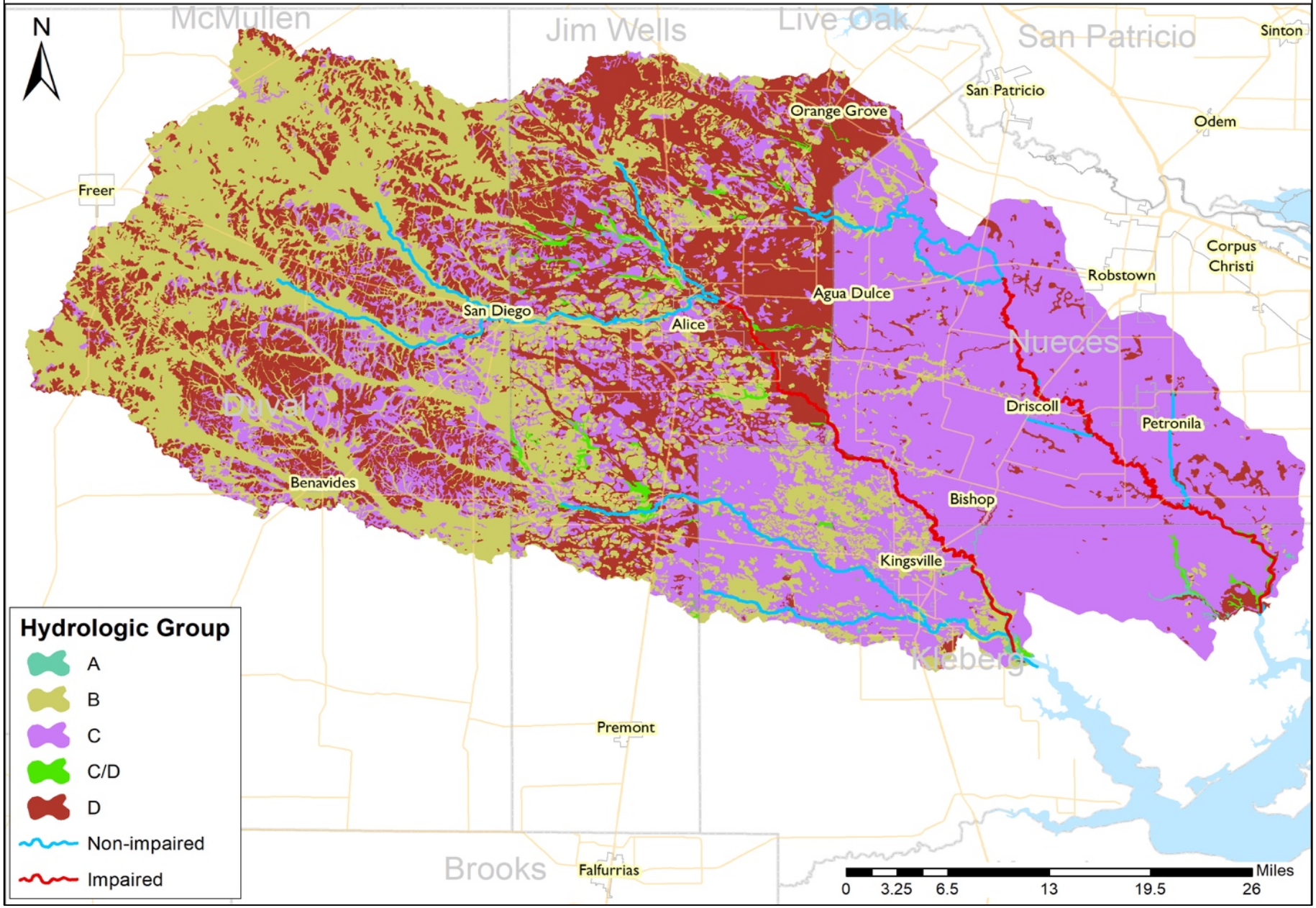
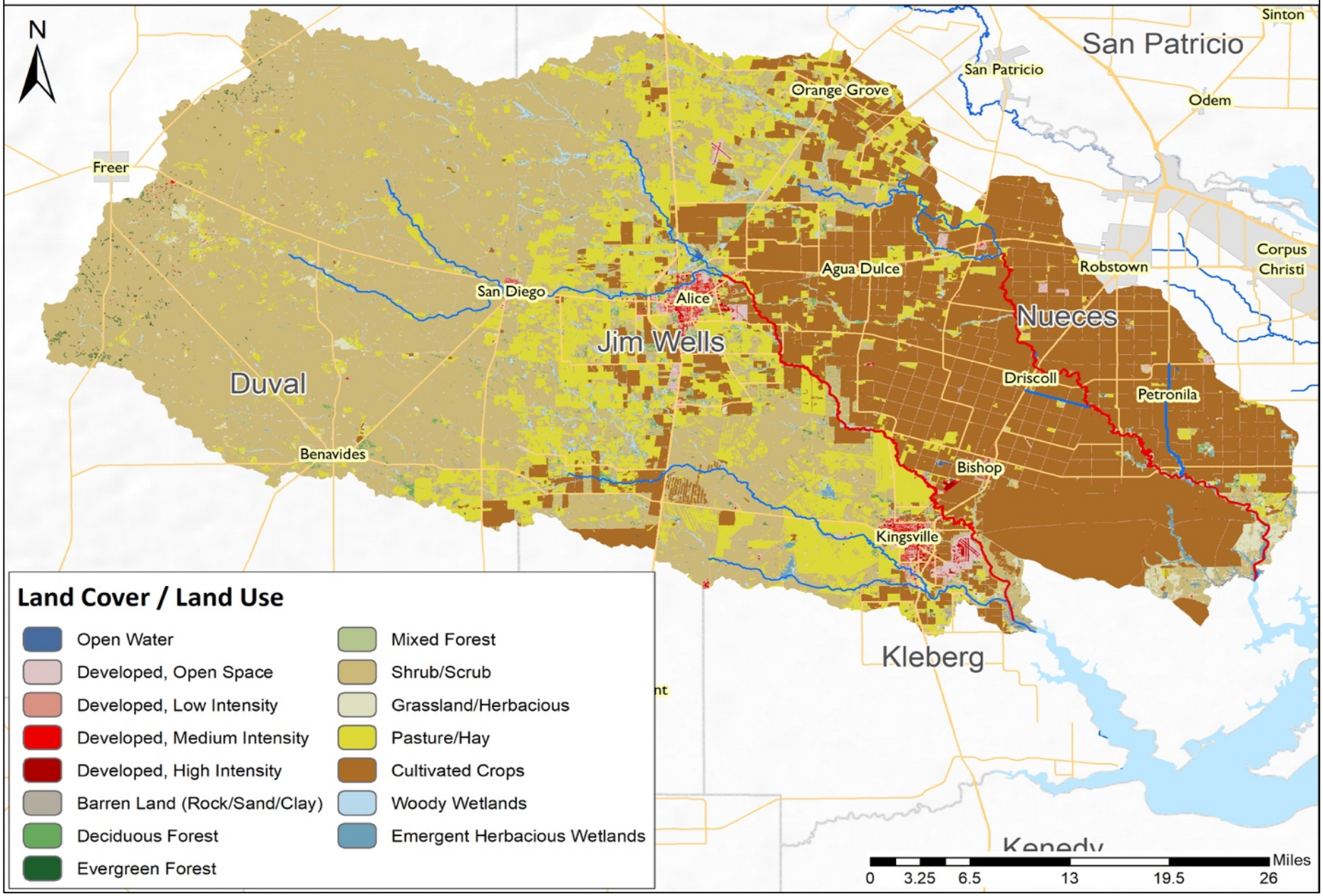


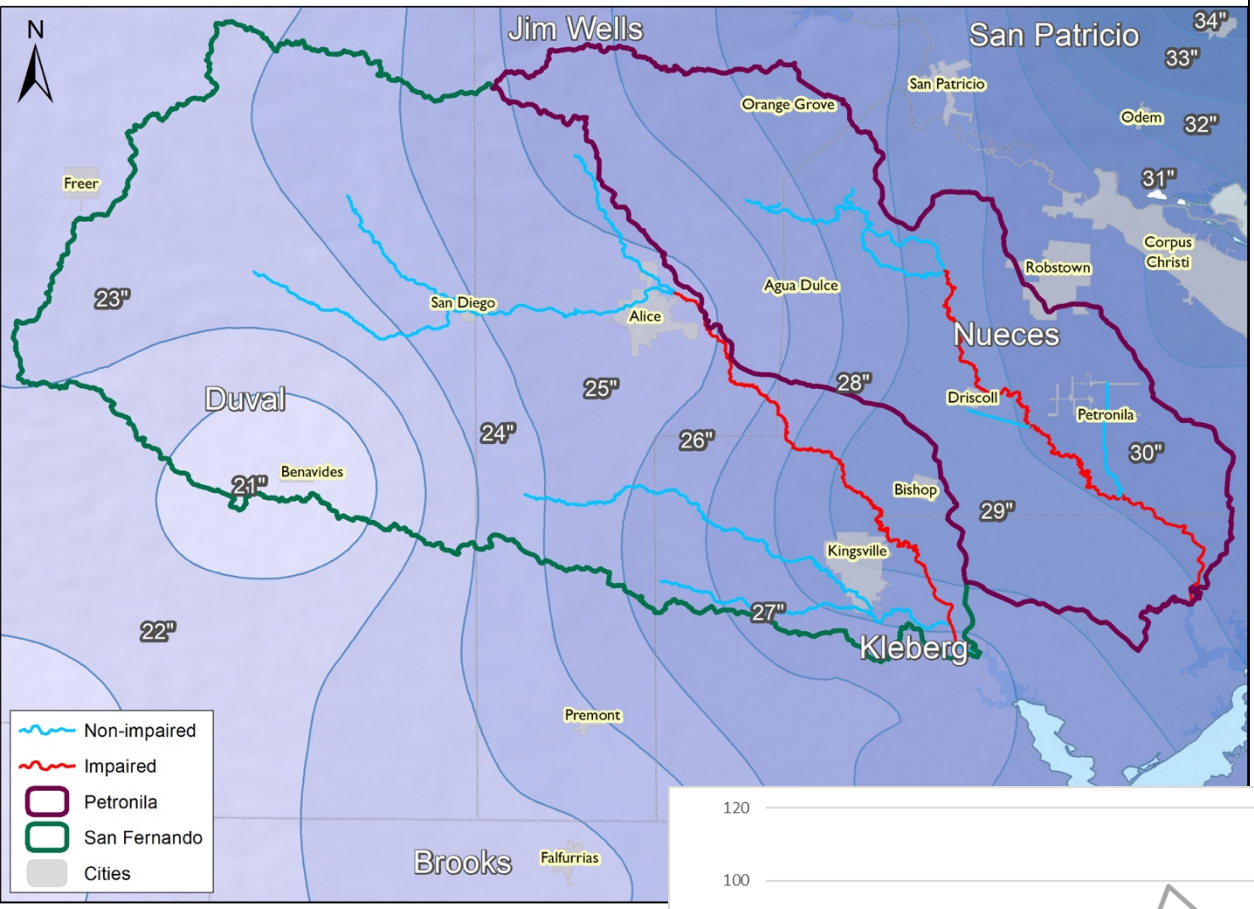
Petronila & San Fernando Creek Soil Hydrologic Group

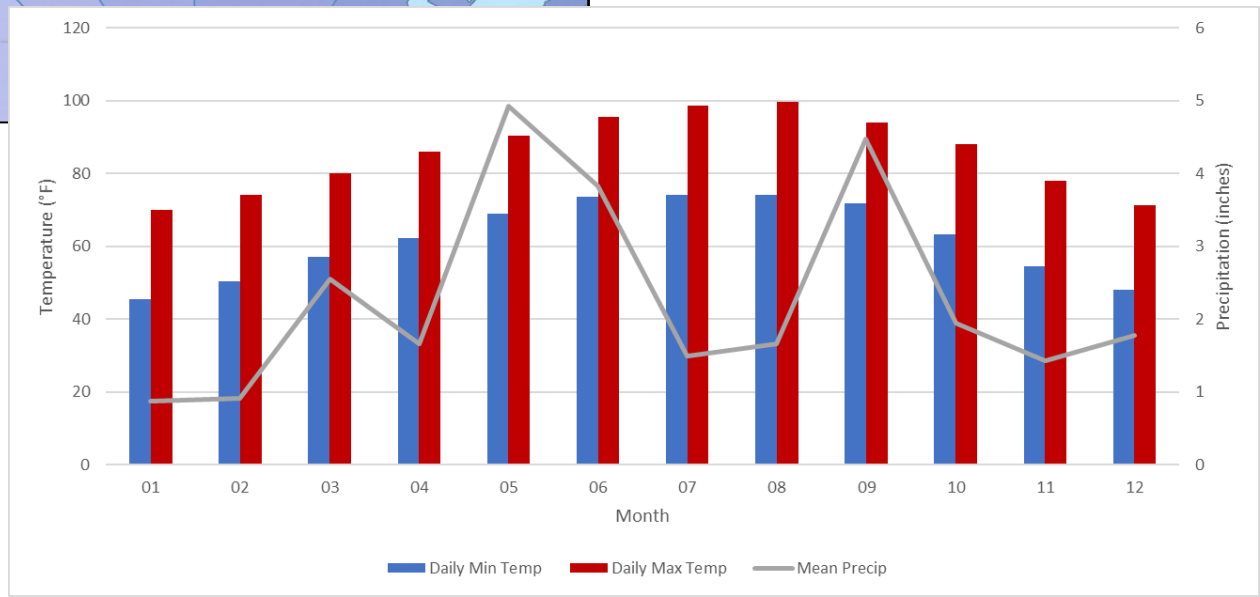


Petronila & San Fernando Creek Land Cover

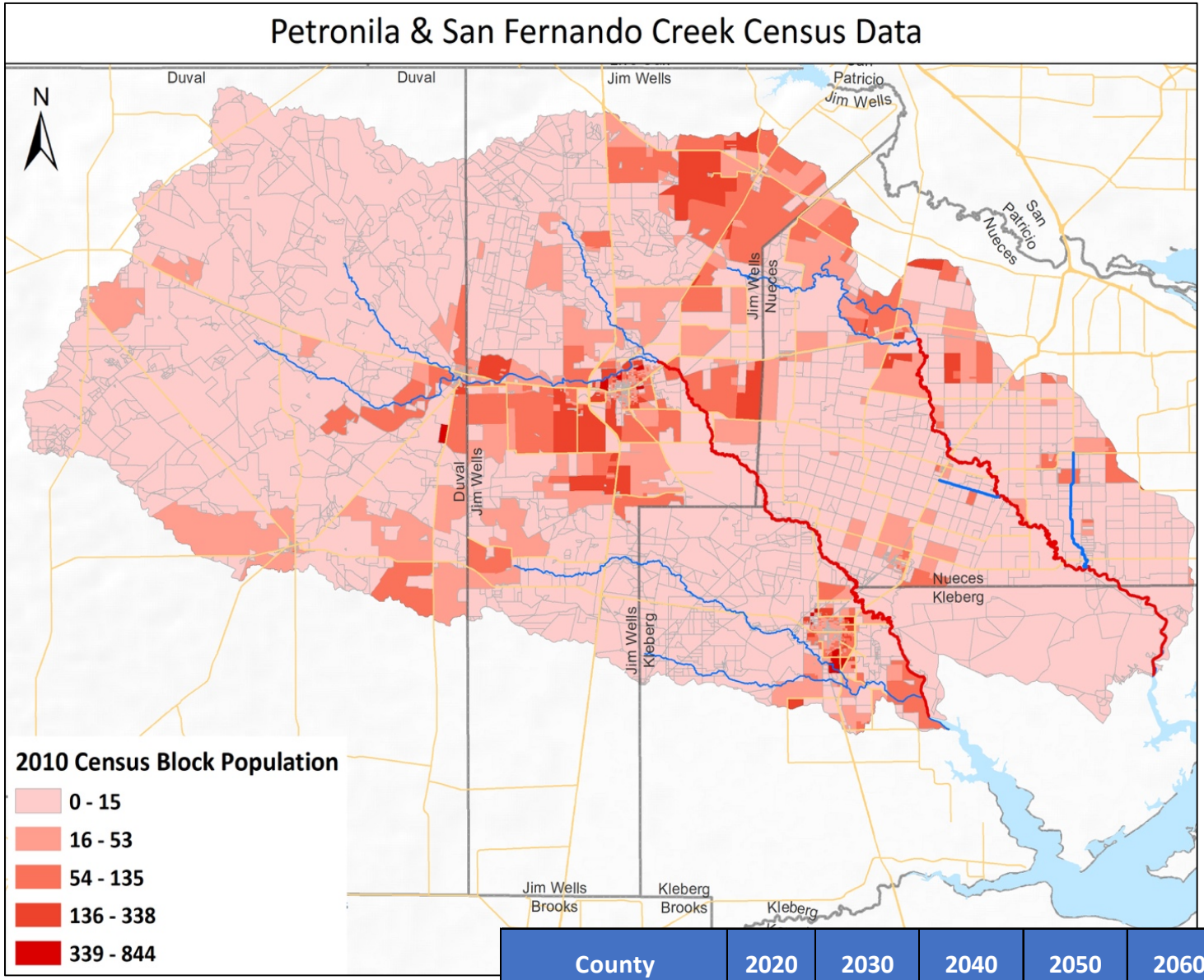


Petronila & San Fernando Average Annual Precipitation





Petronila & San Fernando Creek Census Data



County	2020	2030	2040	2050	2060	2070	Population Increase
Duval	12,715	13,470	14,098	14,644	15,080	15,435	21%
Jim Wells	44,987	48,690	52,052	55,533	58,600	61,410	37%
Kleberg	35,567	38,963	42,202	45,324	48,251	50,989	43%
Nueces	374,157	407,534	428,513	440,797	449,936	465,056	24%
Total in Watershed	467,426	508,657	536,865	556,298	571,867	592,890	27%

CHAPTER 3: WATER QUALITY

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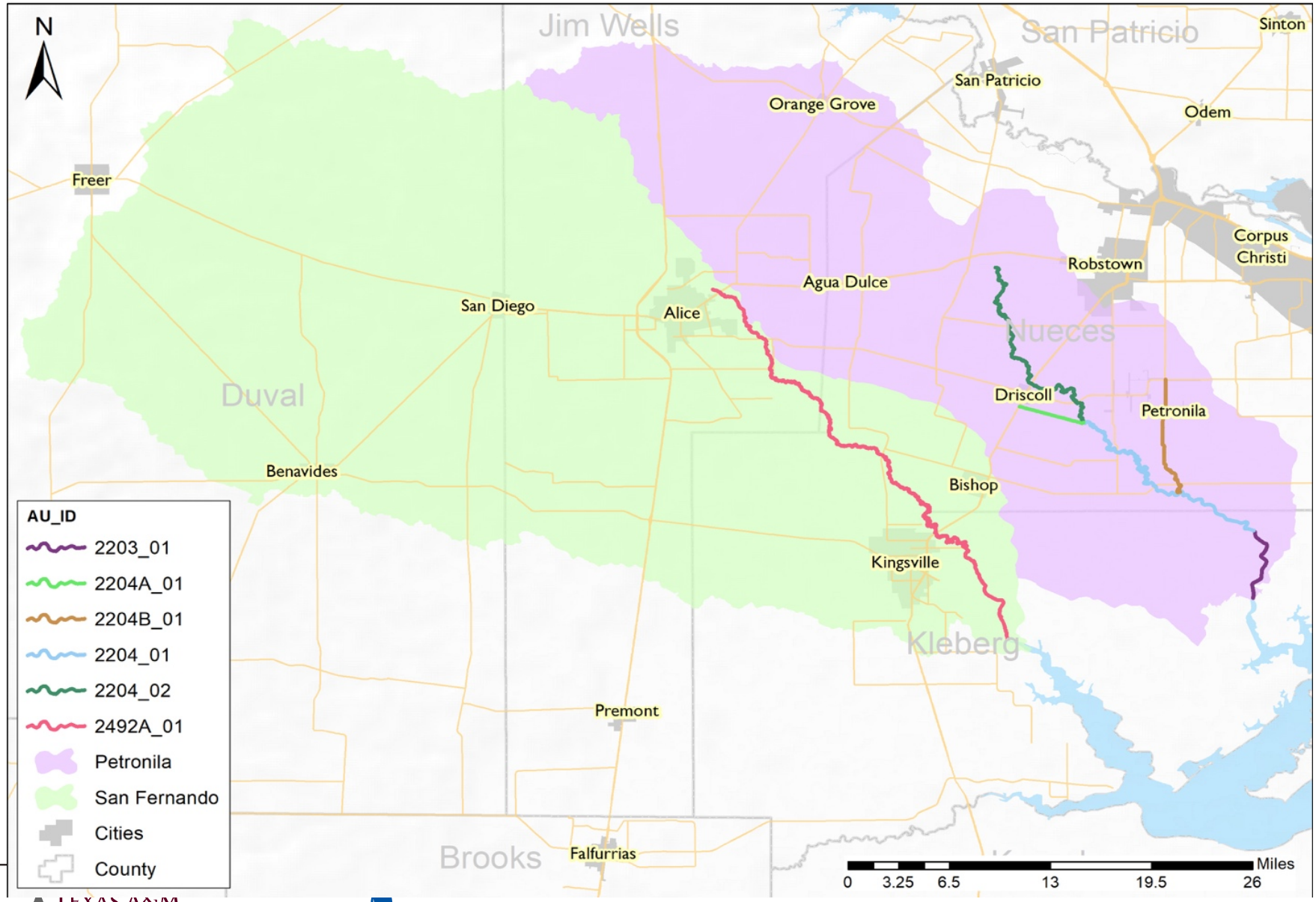
Petronila & San Fernando Creek AUs



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Water Quality Standard

- **Primary Contact Recreation:**
- 126 MPN/100 mL *E. coli* bacteria in freshwater
- 35 MPN/100 mL Enterococcus bacteria in tidal waters
  - Fecal indicator bacteria is used to indicate potential risk for people engaged in primary contact recreation (swimming, diving, and other activities with increased risk of water ingestion) contracting a gastrointestinal illness [1]

Screening Levels

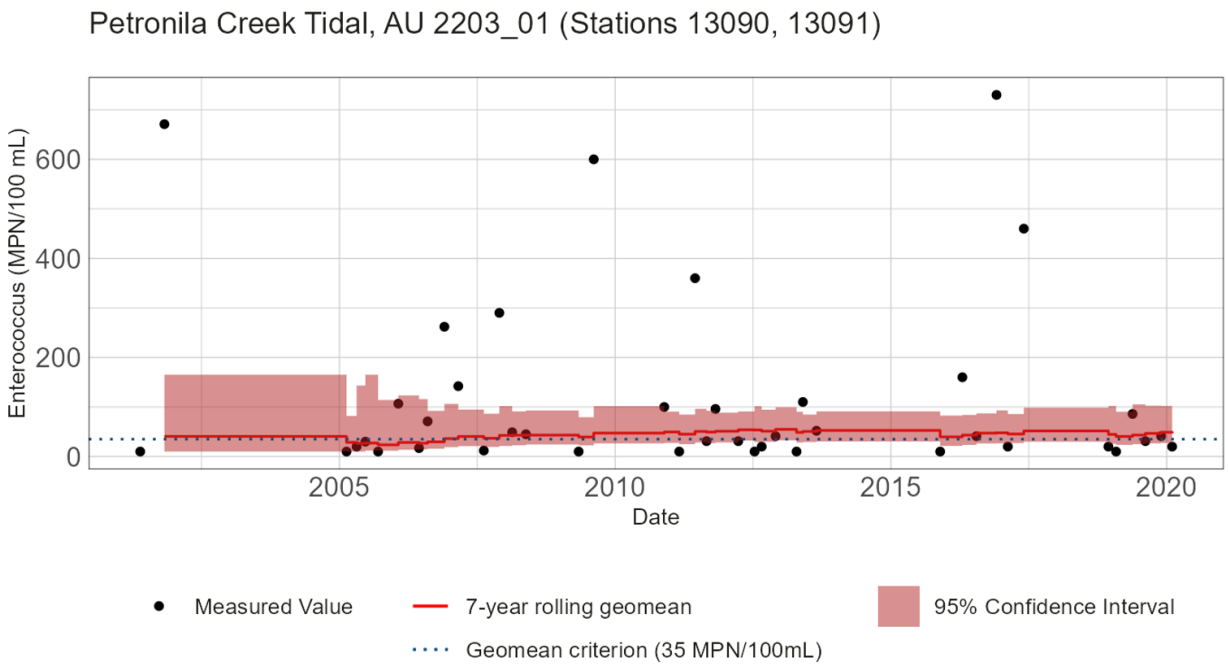
- Chlorophyll-a: 14.1µg/L in surface water streams
  - Measure of algae present in water; too much indicates that excess nutrient loading is causing excess algae growth (some are toxin producing) which can decrease dissolved oxygen

[1] EPA Office of Water. 2012. Recreational Water Quality Criteria. URL: https://www.epa.gov/sites/production/files/2015-10/documents/rwqc2012.pdf

Petronila Creek Tidal

2020 Assessment[1]

- **Contact Recreation**
  - Impaired (Elevated Enterococcus bacteria)
- **General Use**
  - Concern (Chlorophyll-a)



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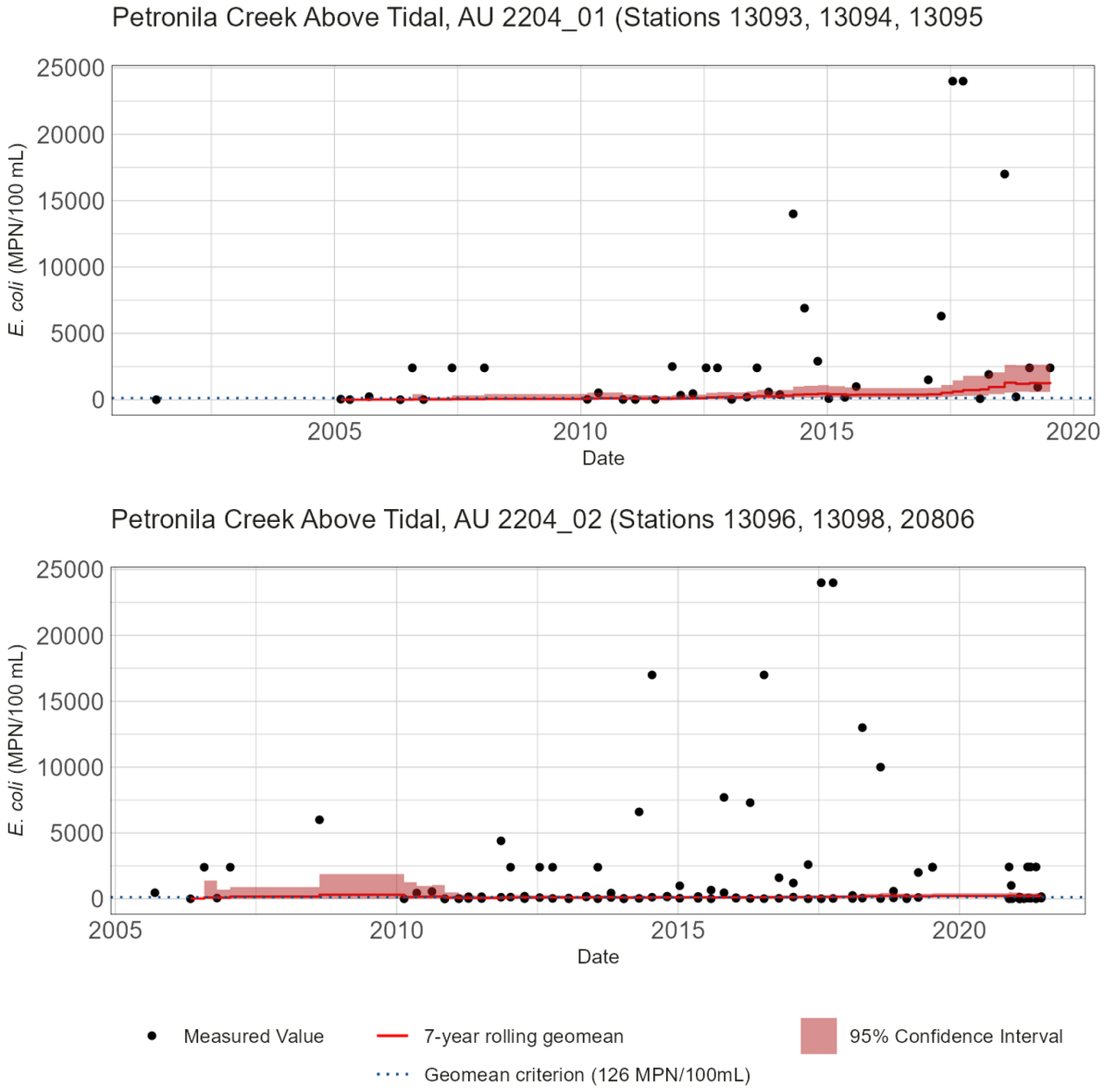
[1] TCEQ. 2020. 2020 Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d) .

Petronila Creek

2020 Assessment[1]

- **Contact Recreation**
  - Impaired (Elevated *E. coli* bacteria)
- **General Use**
  - Concern (Chlorophyll-a)
  - TMDL in place (Chloride, Sulfate, TDS)

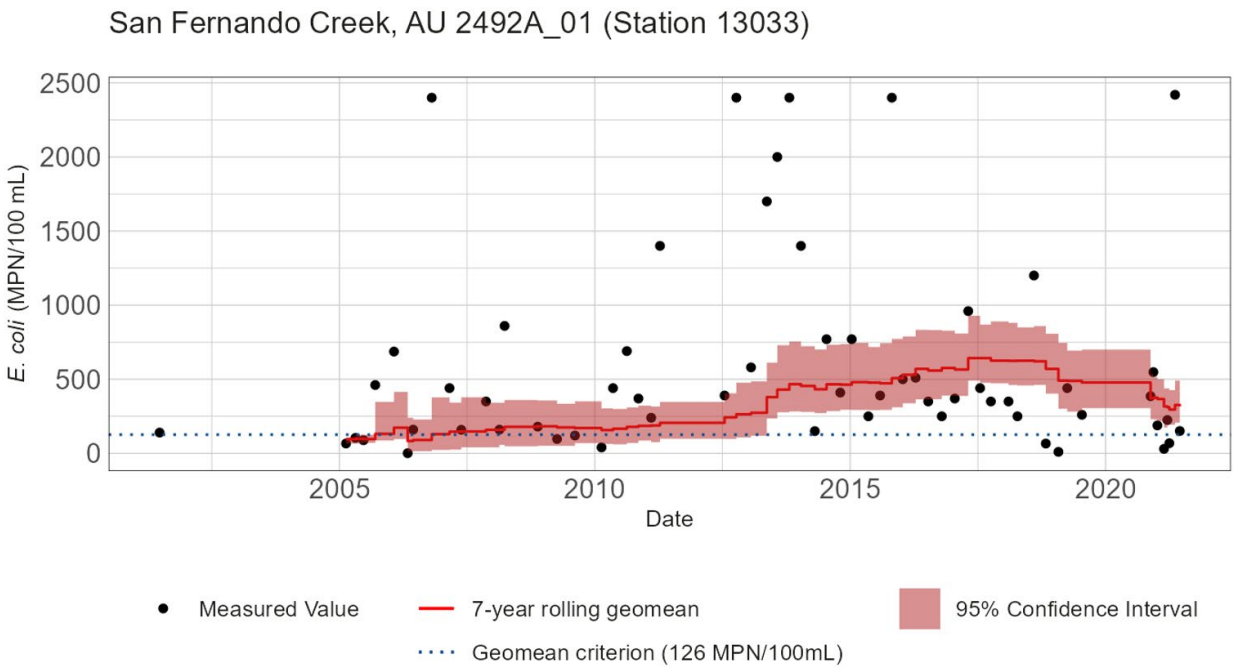


[1] TCEQ. 2020. 2020 Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d) .

San Fernando Creek

2020 Assessment[1]

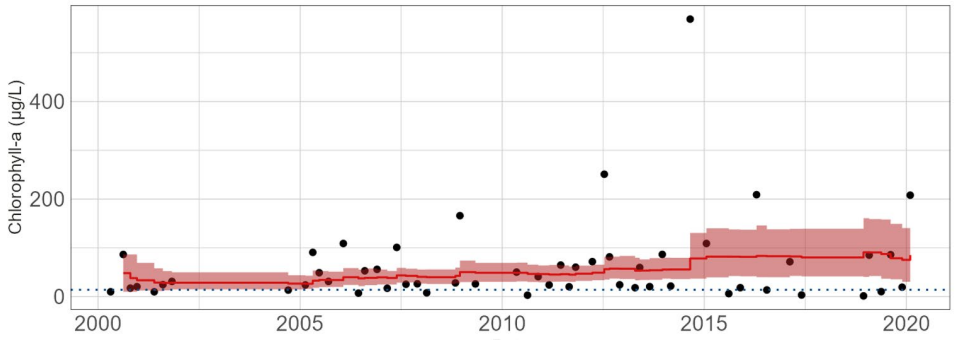
- **Contact Recreation**
  - Impaired (Elevated *E. coli* bacteria)
- **General Use**
  - Concern (Chlorophyll-a, Nitrate, Total Phosphorus)



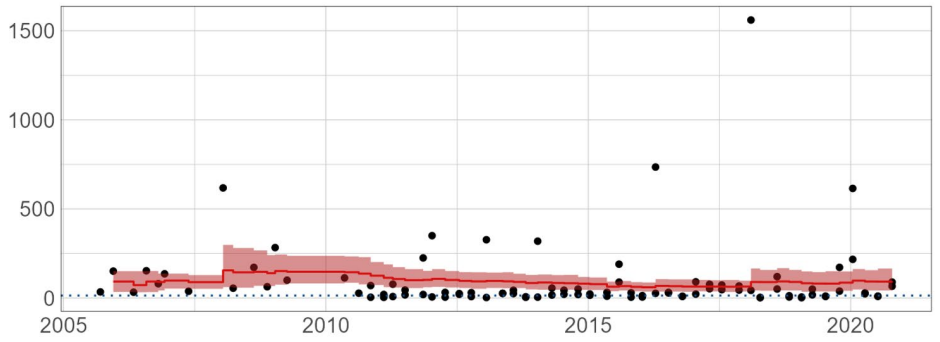
[1] TCEQ. 2020. 2020 Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d)

Chlorophyll-a

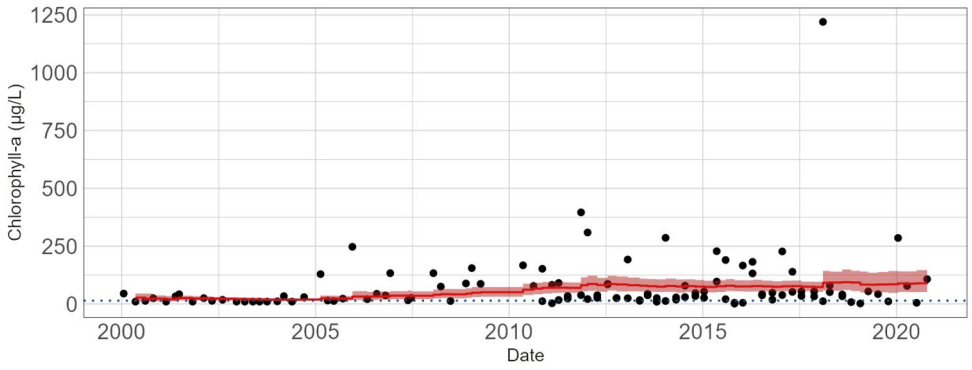
Petronila Creek Tidal, AU 2203_01 (Stations 13090, 13091)



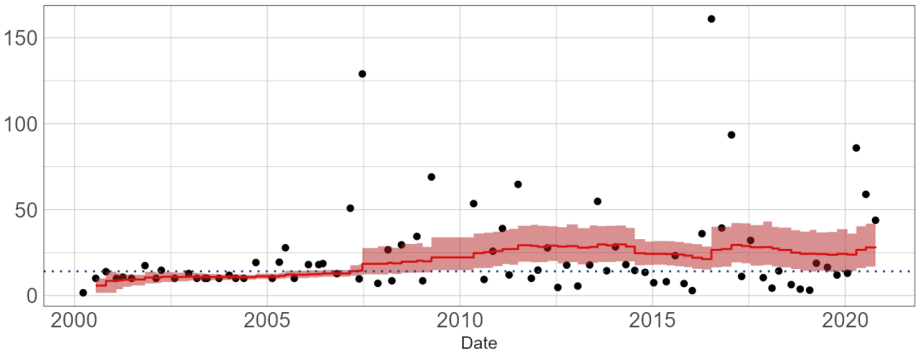
Petronila Creek Above Tidal, AU 2204_02 (Stations 13096, 13098, 20806)

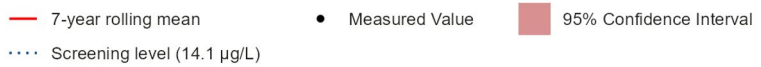


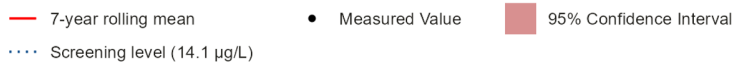
Petronila Creek Above Tidal, AU 2204_01 (Stations 13093, 13094, 13095)



San Fernando Creek, AU 2492A_01 (Station 13033)







WATERSHED POPULATION ESTIMATES

CHAPTERS 4&5 OF WPP

Review of Workgroup Meetings

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Cattle Population Estimates in the Watershed

- Watershed Estimates for Cattle populations
  - Petronila – 8,670
  - San Fernando – 29,544
- Total – 38,214

  - Created a % Land Cover Based Stocking Rate based on Farm Service Agency County Recommendations for each Sub-Watershed
  - Verified that modeled # of head matched closely to 2017 NASS Data

Other Livestock

- 2017 National Agricultural Statistical Survey (NASS) Data

Watershed	Horse	Goat	Sheep
Petronila	437	733	231
San Fernando	711	1,734	526
Total	1,148	2,467	757

Deer

- Deer – Resource Management Unit (RMU) density estimates survey density; used average of most recent 5 years
  - 61.7 ac/deer for Duval and most of Jim Wells Co.
  - 26.1 ac/deer for Kleberg, Nueces and part of Jim Wells Co.
  - Applied to all land covers but barren, developed, open water
  - Applied 10% deer density to cropland to reflect decreased use in crop dominated areas with little cover

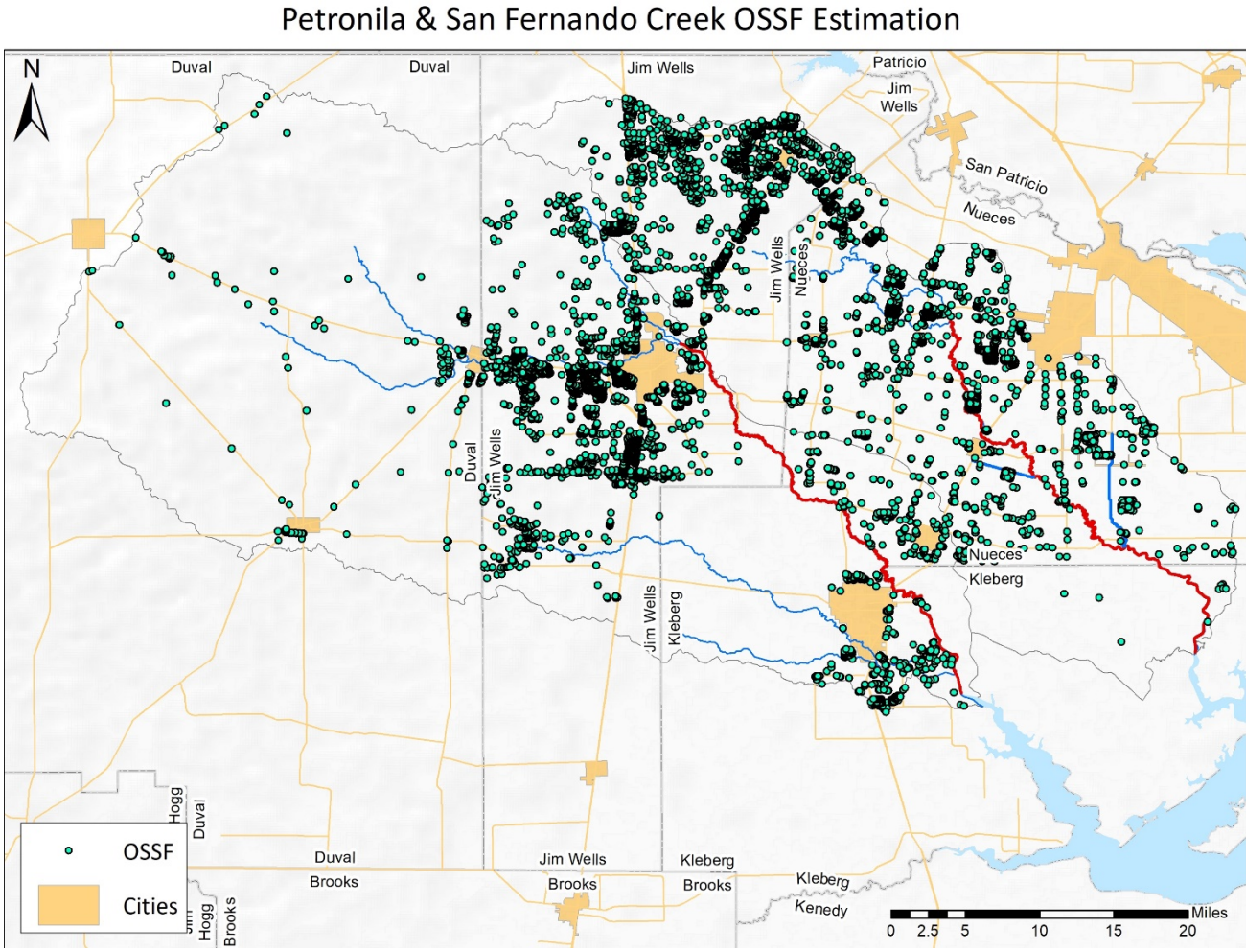
Feral Hogs

- Feral Hogs – Texas A&M Natural Resources Institute Method
  - 39.4 ac/hog applied to all land cover but barren, developed, open water
  - Applied 10% density for cropland

County	Wildlife in Watershed	
	Feral Hogs	Deer
Petronila	3,933	4,071
San Fernando	17,826	13,522
Total	**23,759**	**17,593**

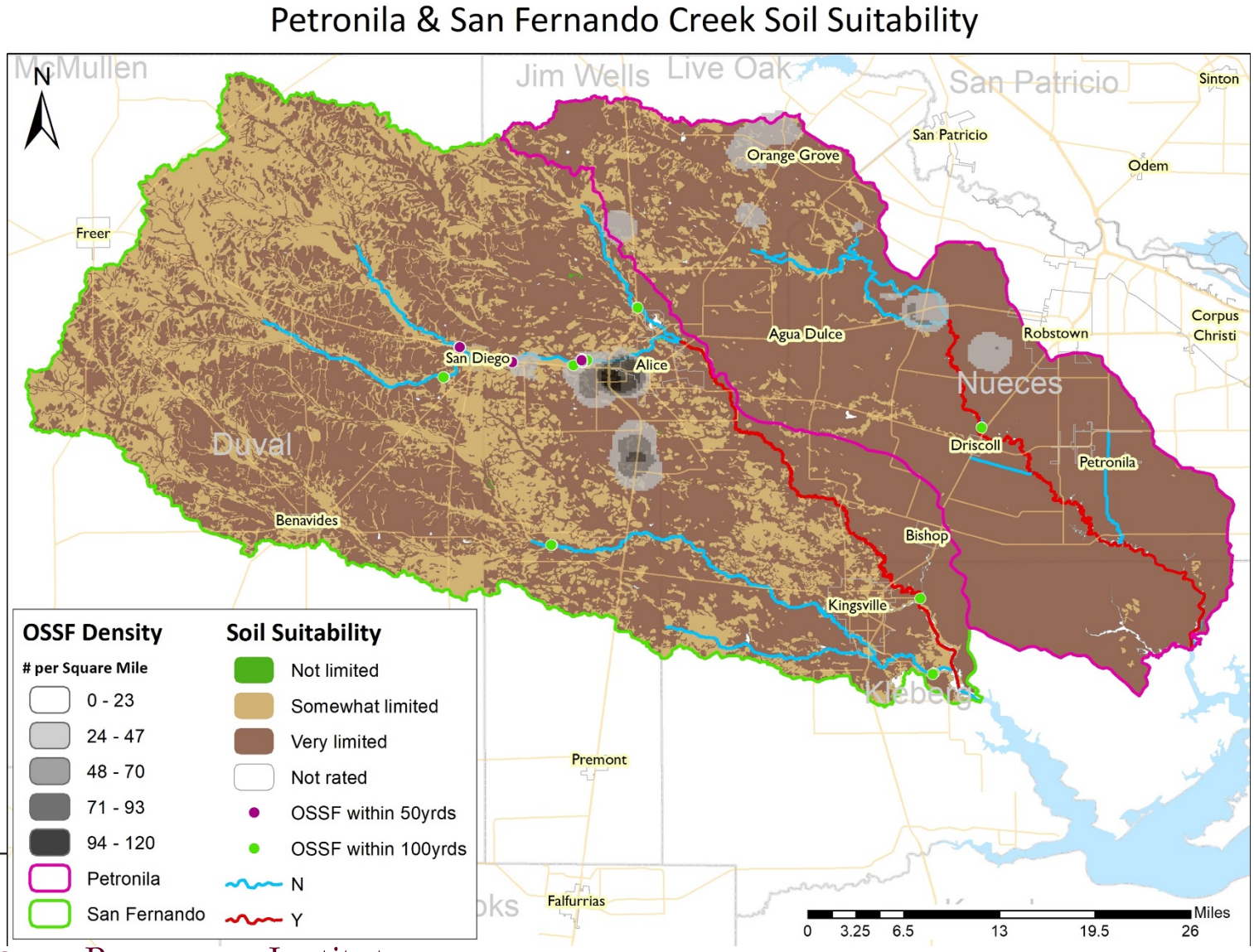
OSSF Point Map

- Estimated using
  - Coastal Zone OSSF dataset
  - 911 address points
- **9,086 OSSFs estimated in watershed**



OSSF Density and Soil Suitability

- 20 OSSFS within 100 yards of creeks (5 within 50 yards)
- 76% of watershed in very limited soils.



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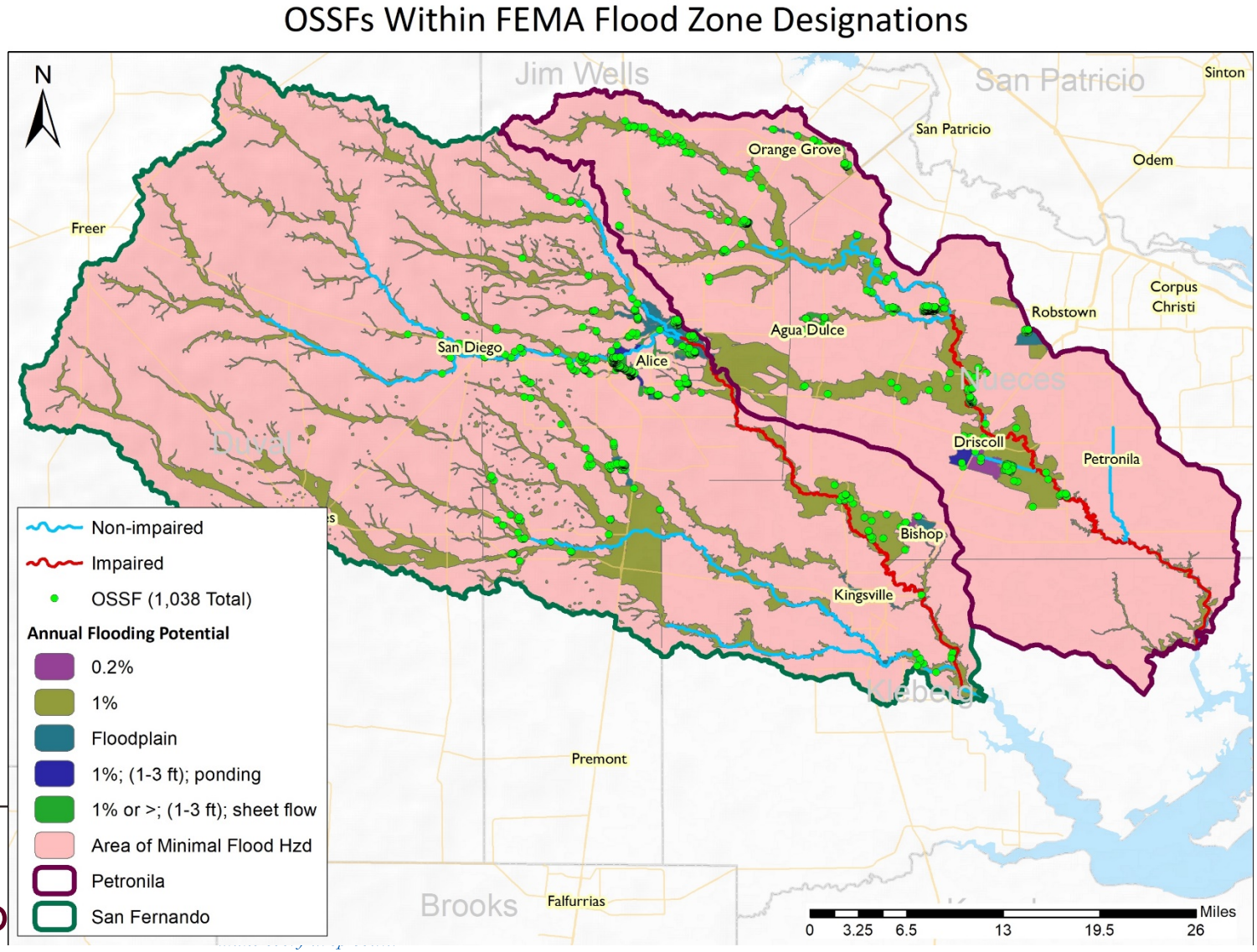
OSSFs in FEMA Flood Zones

1,038 OSSFS within Flood-prone areas

Mapping not consistent across county line



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Dog/Cat Estimates

County	Households	Cat	Dog
Duval	3,339	1,855	1,159
Jim Wells	13,660	7,589	4,743
Kleberg	11,091	6,162	3,851
Nueces	4,830	2,683	1,677
Total	**32,920**	**18,289**	**11,431**

Households from 2010 Census block data. Dog and cat count uses the average number owned per household provided by the American Veterinary Medical Association: 2017-2018 U.S. Pet Ownership Demographics Sourcebook

Name	Received Water Body	Design Flow (MGD)	Recent Average Flow (MGD)	Operation Status	Quarters in NC (5 years) (10/17 - 09/20)*
Duval County Conservation and Reclamation District (Benavides WWTP)	San Fernando Creek	0.25	0.25	Active	0 (or no data reported)
Bishop CISD	Petronila Creek	0.008	0.01	Active	0
City of Bishop WWTP	Caretta Creek	0.32	0.17	Active	12 (8 BOD, 9 E. coli, 1 Total Amonia, 4 TSS)
Ticona Polymers Inc	San Fernando Creek	3.5	2.68	Active	10 (2 BOD, 1 Flow, 1 COD, 1 Selinium, 1 Nickel, 2 TSS)
San Diego MUD 1	San Diego Creek	0.75	0.30	Active	12 (Failure to report)
Agua Dulce WWTP	Agua Dulce Creek	0.16	0.11	Active	3 (Missing Measurements)
Banquete WWTF	Banquete Creek	0.1	0.81	Active	11 (1 BOD, 3 E. coli, 4 Flow, 5 TSS, 1 Reporting)
Orange Grove WWTF	Leon Creek	0.2	0.15	Active	1 (E. coli)
Kingsville III WWTF	Tranquitas Creek	3.0	2.51	Active	7 (3 Copper, 1 Flow, 4 Reporting)
Kingsville I WWTF	Santa Gertrudis Creek	1.0	0.90	Active	7 (1 E. coli, 4 Reporting)
Coastal Bend Detention Center WWTF	Petronila Creek	0.15	0.15	Active	12 (2 Chlorine, 6 Flow, 1 Arsenic, 2 Cadmium, 1 Selinium, 8 Reporting)
US Ecology Texas Inc.	Petronila Creek		0.003	Active	6 (3 Arsenic, 2 pH, 4 Reporting)
Southside WWTF (Alice)	Lattas Creek	2.6	1.75	Active	7 (3 E. coli, 4 Reporting,
Northeast WWTF (Alice)	San Fernando Creek	2.02	0.90	Active	6 (1 BOD, 5 E. coli)
City of Driscoll WWTF	Petronila Creek	0.1	0.04	Active	9 (2 BOD, 2 E. coli, 1 DO, 6 TSS)

Impaired
Non-impaired
Roads
Cities
Counties
Baffin Bay Watershed

Petronila & San Fernando Creek WWTPs

N

Sources:
Outfall Permits - TCEQ
Stream Segments - TCEQ
Counties, Cities, Roads - TNRIS

0 3.75 7.5 15 22.5 30 Miles

Active Permitted WWTP

1: Alice Northeast WWTF
2: Alice Southside WWTF
3: Banquete WWTF
4: Bishop CISD
5: City of Bishop WWTP
6: City of Agua Dulce WWTP
7: Coastal Bend Detention Center WWTF
8: Duval Co Conservation and Reclamation Dist
9: Kingsville I WWTF
10: Kingsville III WWTF
11: Orange Grove WWTF
12: San Diego MUD 1
13: Ticona Polymers Inc
14: US Ecology Texas Inc
15: City of Driscoll

Thank You!

Project websites:
https://twri.tamu.edu/baffinwpp

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