

# Tres Palacios Creek Watershed Meeting Overview

*Texas Water Resources Institute*  
*May 11, 2016*



# Topics for Today

- ⦿ Objectives
  - ⦿ Review Chapter 1 and 2
  - ⦿ Gain input for Chapter 3, 4, and 5
- ⦿ Chapter 1 – Watershed Management
- ⦿ Chapter 2 – Watershed Characterization
- ⦿ Chapter 3 – Estimates of Pollutant Source Loads and Needed Load Reductions
- ⦿ Chapter 4 – Strategies for Watershed Protection Plan Implementation
- ⦿ Chapter 5 – Source for Watershed Protection Plan Implementation
  - ⦿ Technical and Financial Assistance

# Introductions

- ◎ Name
- ◎ Entity/group representing/  
landowner/interested citizen, etc.

# Chapter 1 – Watershed Management



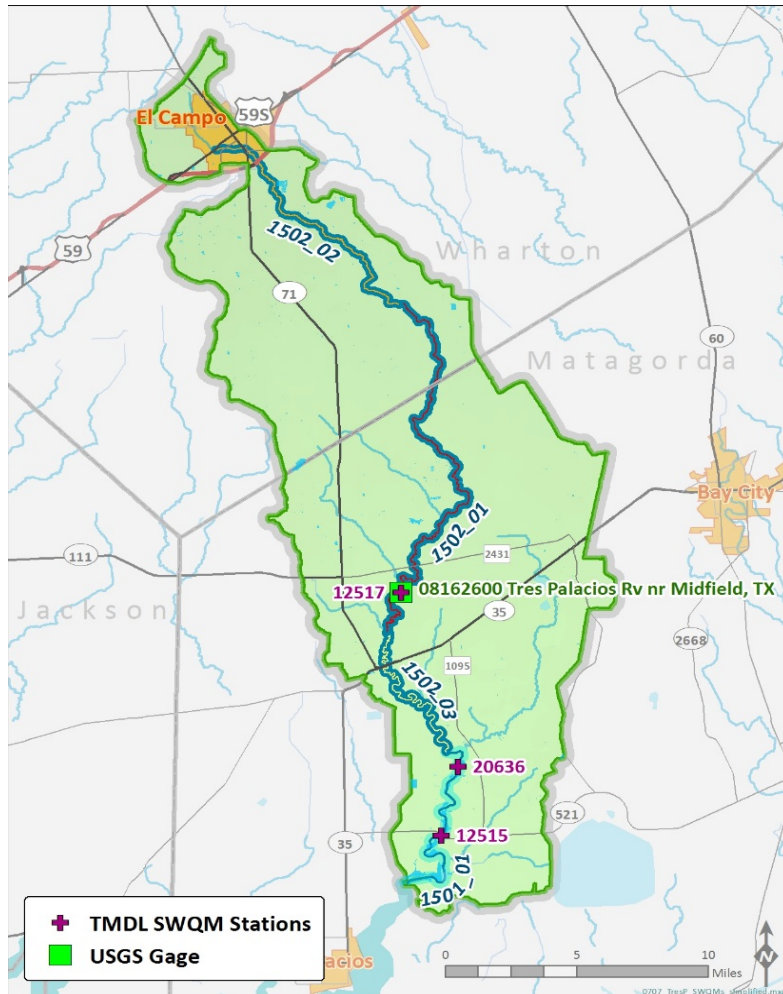
# Chapter 1 – Watershed Management

- ⦿ Definition of a Watershed - Land Use that drains into a common waterway
- ⦿ Watershed and Water Quality
  - ⦿ Point source pollution – pollution discharged from a defined point
  - ⦿ Nonpoint source pollution – pollution coming from a source that does not
- ⦿ Benefits of a watershed approach - involving stakeholders and geographic boundaries rather than political boundaries
- ⦿ Watershed Protection Planning – 9 Element Plan
- ⦿ Adaptive Management – allows for changes to be made

# Chapter 2 – Watershed Characterization

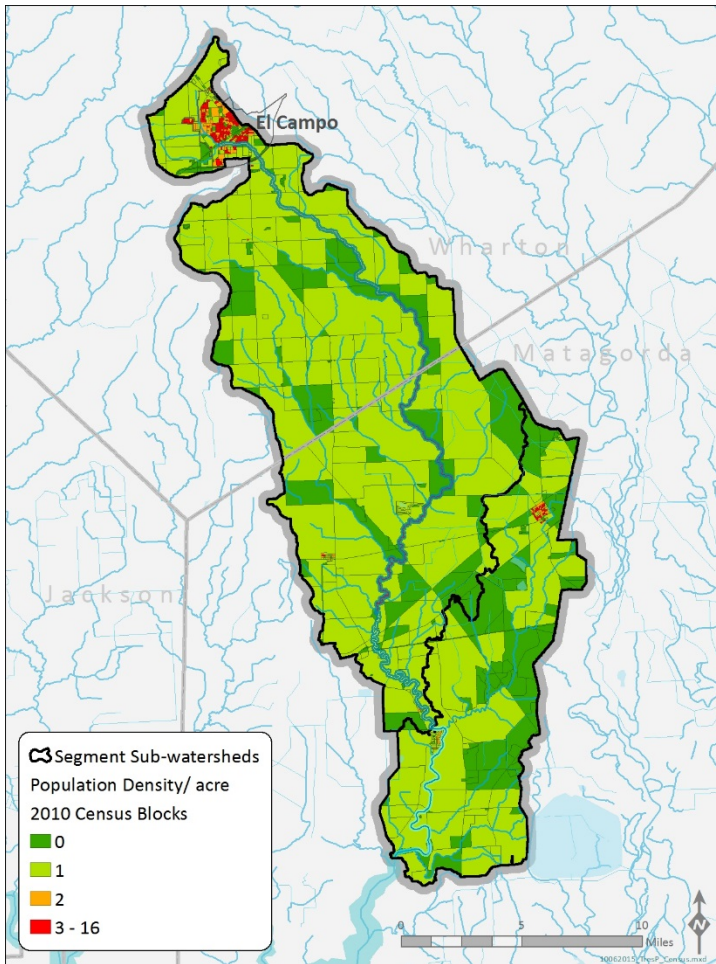


# Tres Palacios Watershed Description



- 171,816 acres (268.5 square miles)
- Creek begins near El Campo in Wharton County
- Tidal segment begins ~0.5 miles upstream of confluence with Wilson Creek and flows ~9 miles into Tres Palacios Bay
- Meets Tres Palacios Bay near Palacios in Matagorda County
- 2 Monitoring Sites in Tidal Section
  - ▲ **20636** – downstream of confluence with Wilson Creek
  - ▲ **12515** – at FM 521

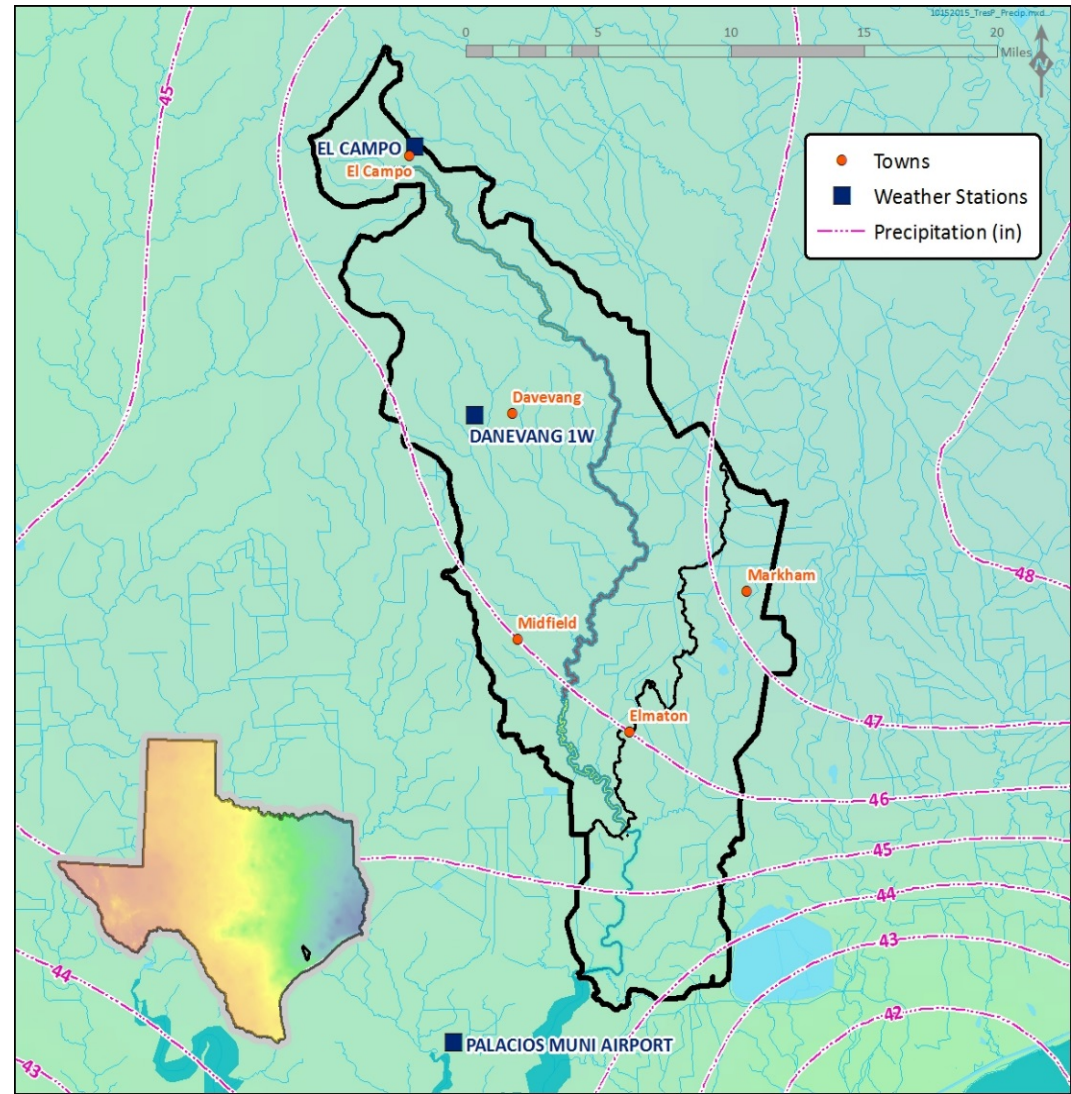
# Total Population



Watershed	Segment	2010 Census Population
Tres Palacios Creek	Tidal (1501)	1,788
	Above Tidal (1502)	12,875
	<b>Total</b>	<b>14,663</b>

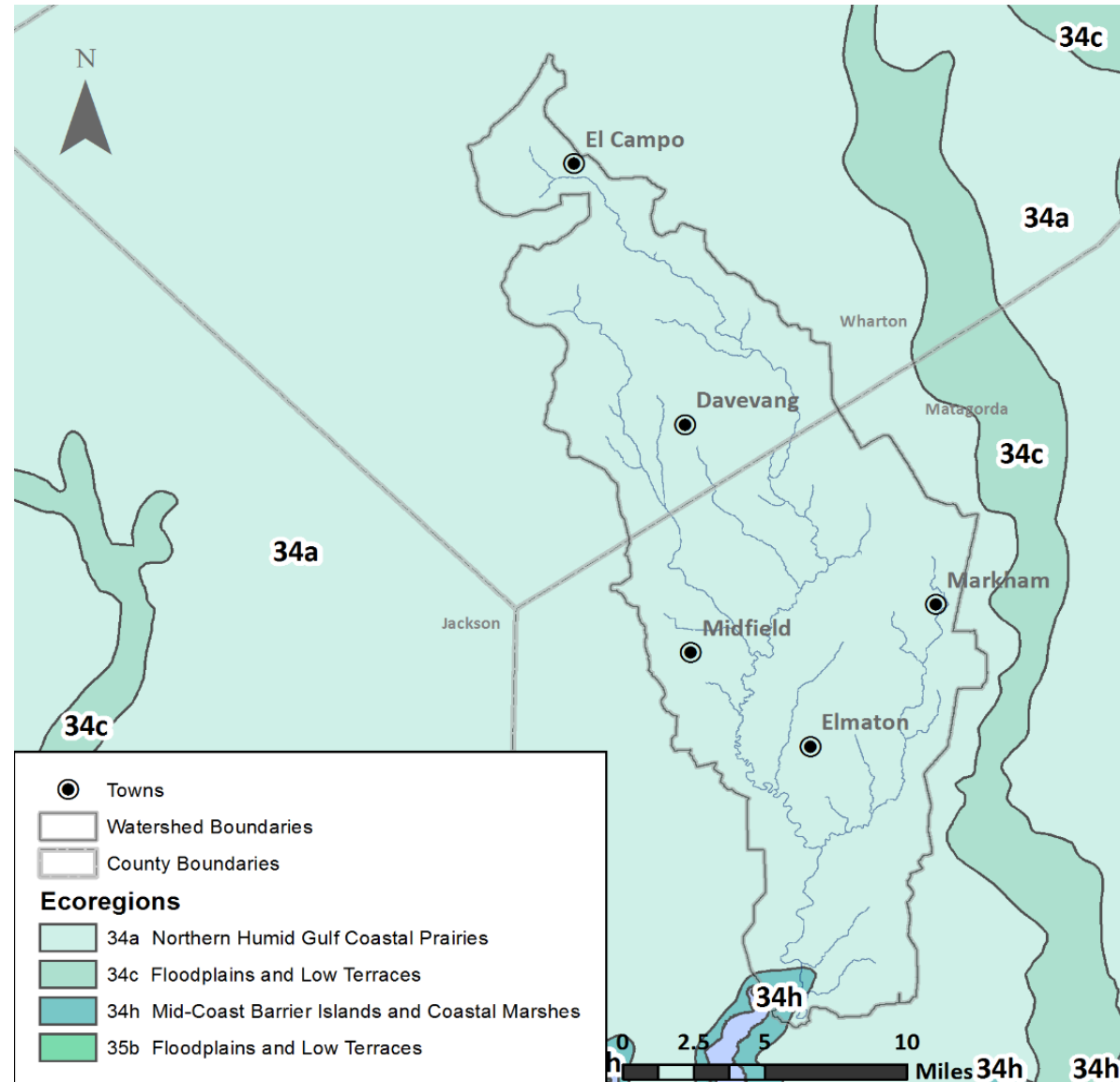
# Climate & Annual Precipitation

- ⦿ Average High Temperatures in August  $\sim 93.5^{\circ}$  F
- ⦿ Average Lows in January are  $\sim 41.5^{\circ}$  F

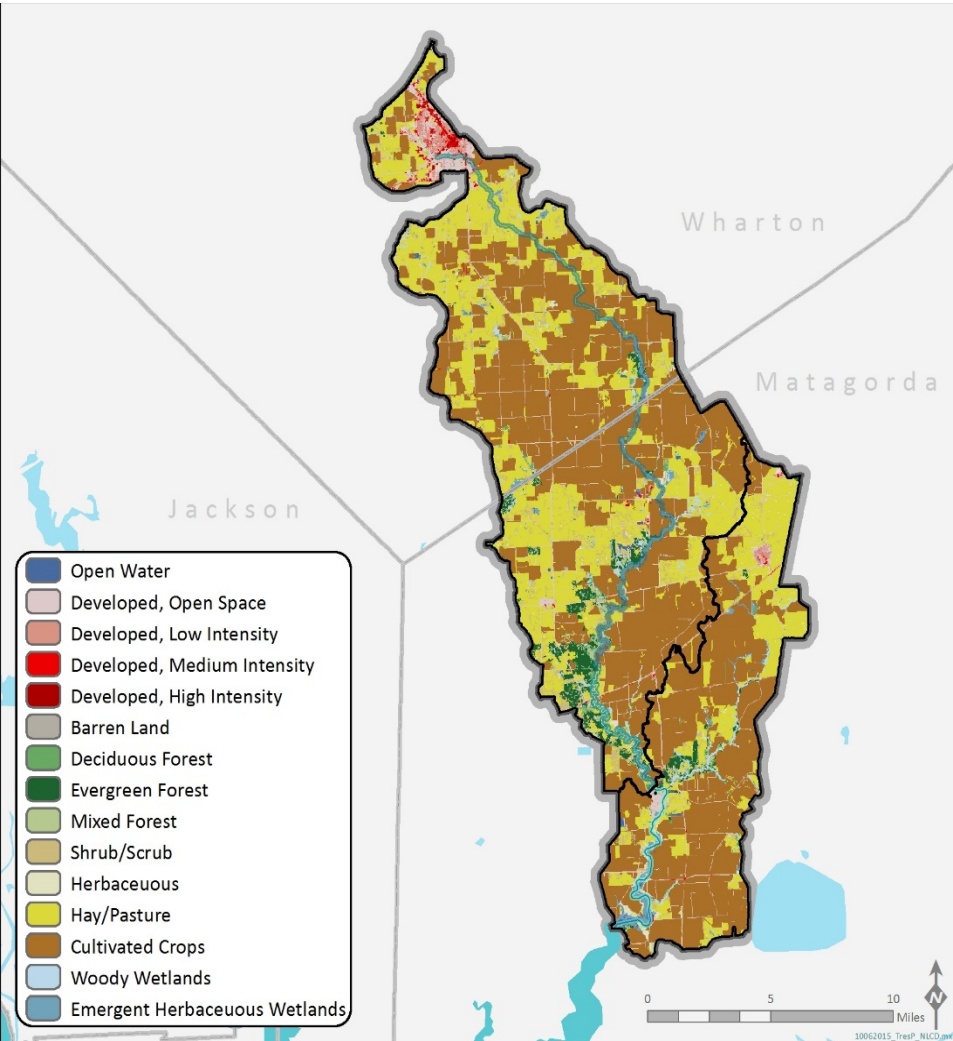


# Ecoregions

- ⦿ Landscape is mostly flat with gently rolling slopes.
- ⦿ Grassland is dominant vegetation.

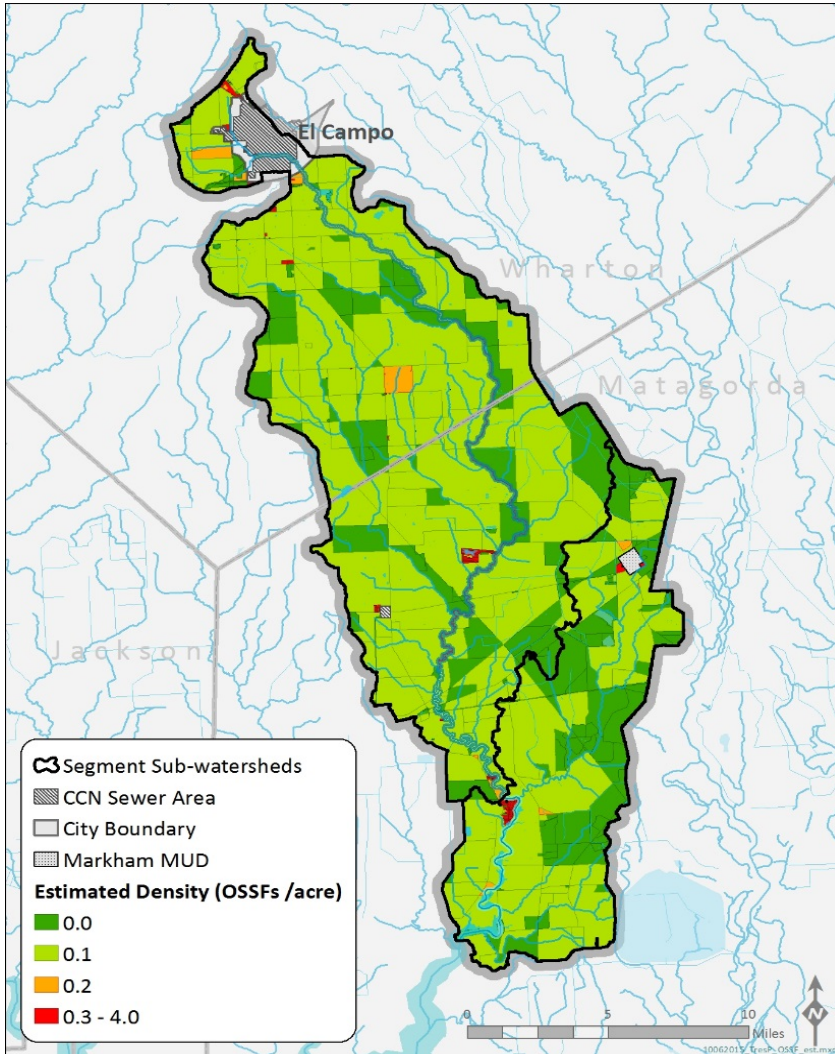


# Land Cover in the Watershed



2011 NLCD Classification	Tres Palacios Creek Tidal (1501)		Tres Palacios Creek Above Tidal (1502)		Tres Palacios Creek Watershed Total	
	mi <sup>2</sup>	% of Total	mi <sup>2</sup>	% of Total	mi <sup>2</sup>	% of Total
Open Water	1.0	1.2%	0.5	0.3%	1.5	0.6%
Developed, Open Space	2.7	3.5%	9.0	4.8%	11.8	4.4%
Developed, Low Intensity	0.8	1.0%	2.2	1.2%	3.0	1.1%
Developed, Medium Intensity	0.1	0.1%	1.0	0.5%	1.1	0.4%
Developed, High Intensity	0.0	0.0%	0.4	0.2%	0.4	0.1%
Barren Land	0.1	0.1%	0.1	0.1%	0.2	0.1%
Deciduous Forest	0.6	0.8%	2.2	1.2%	2.8	1.0%
Evergreen Forest	1.1	1.4%	4.8	2.5%	5.8	2.2%
Mixed Forest	0.5	0.7%	1.8	0.9%	2.3	0.8%
Shrub/Scrub	1.8	2.3%	8.3	4.4%	10.1	3.8%
Herbaceous	1.4	1.7%	1.7	0.9%	3.0	1.1%
Hay/Pasture	18.8	23.9%	59.8	31.5%	78.6	29.3%
Cultivated Crops	47.0	59.8%	93.8	49.4%	140.9	52.5%
Woody Wetlands	1.2	1.5%	3.4	1.8%	4.6	1.7%
Emergent Herbaceous Wetlands	1.5	1.9%	0.9	0.5%	2.4	0.9%
<b>Total</b>	<b>78.6</b>	<b>100%</b>	<b>189.9</b>	<b>100%</b>	<b>268.5</b>	<b>100%</b>

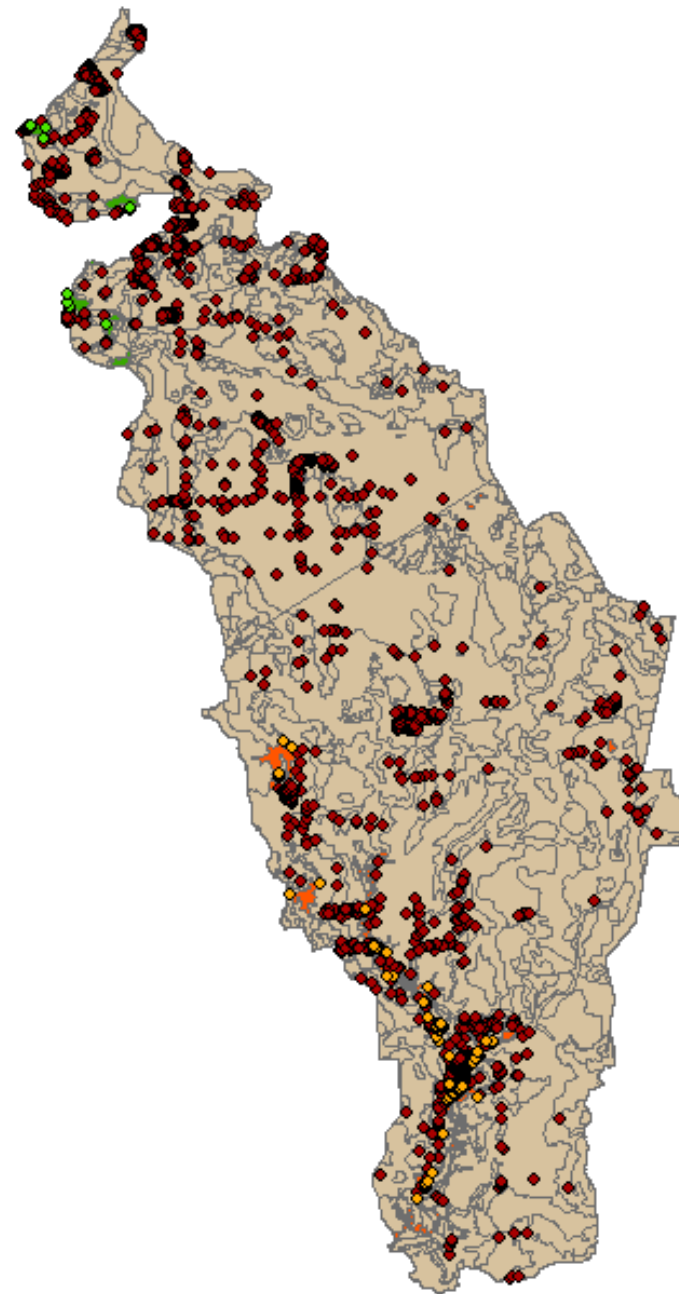
# OSSF Estimates



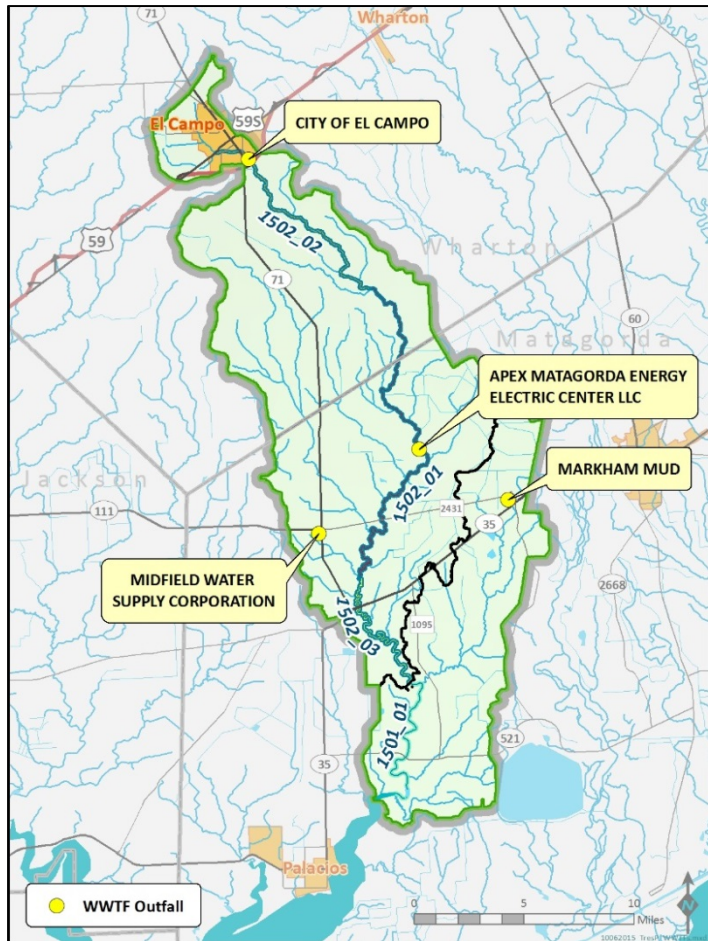
Watershed	Segment	Estimated OSSFs
Tres Palacios Creek	Tidal (1501)	510
	Above Tidal (1502)	1,288
	<b>Total</b>	<b>1,798</b>

# Estimated OSSFs and Soils Map

Soil Type	Failure Rate	Number of OSSFs	Percent of OSSFs
not limited	5%	11	0.69%
somewhat limited	10%	66	4.16%
very limited	15%	1,511	95.52%
<b>Total</b>	<b>N/A</b>	<b>1,588</b>	<b>100%</b>

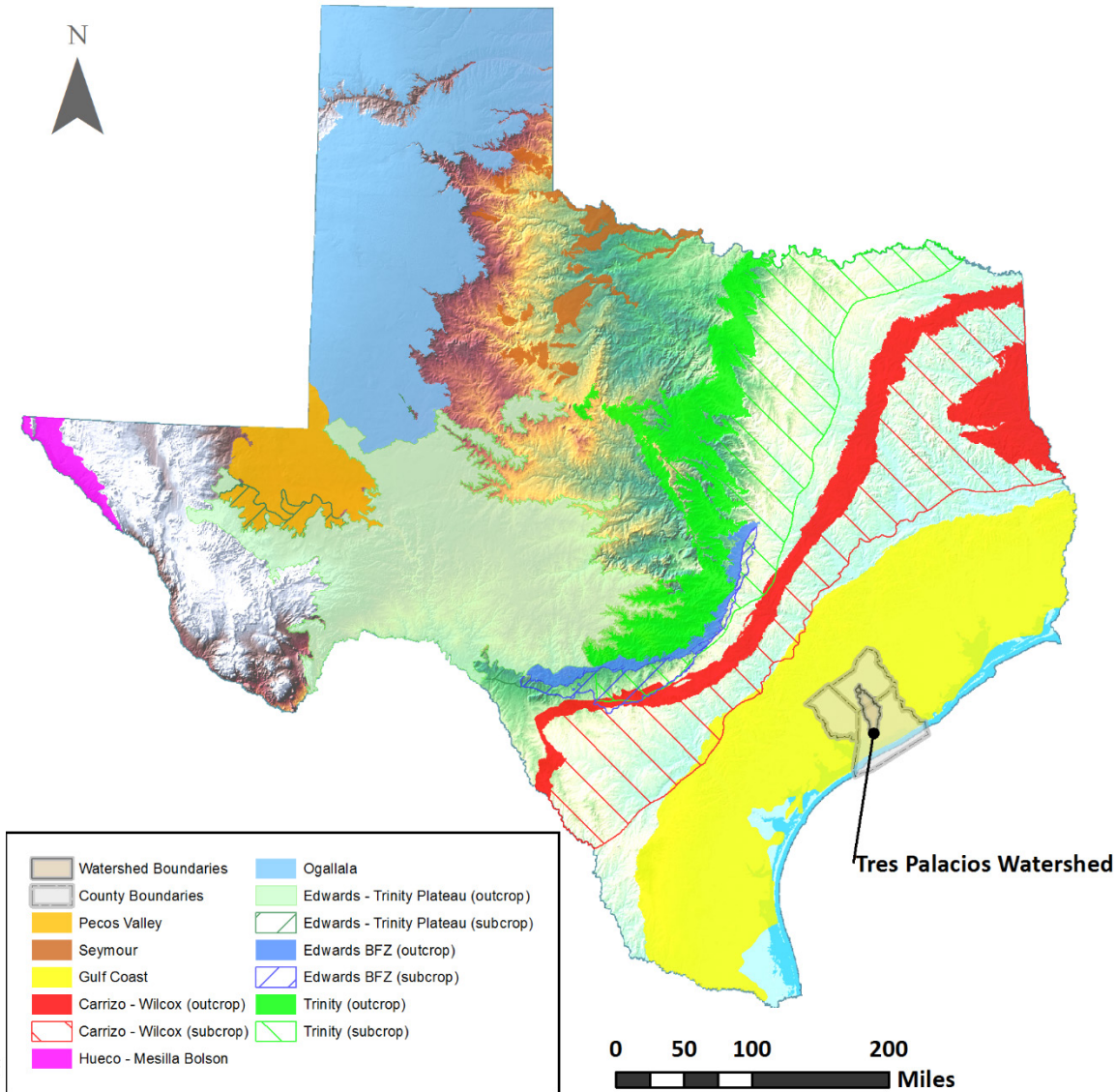


# WWTFs within Tres Palacios Watershed

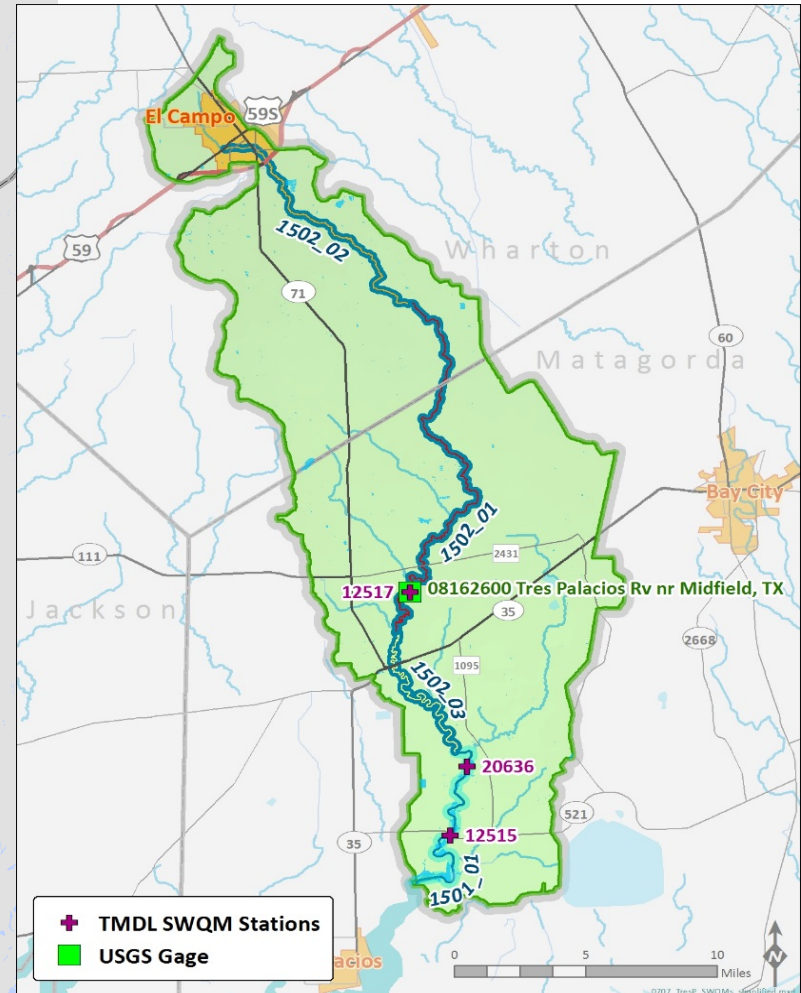
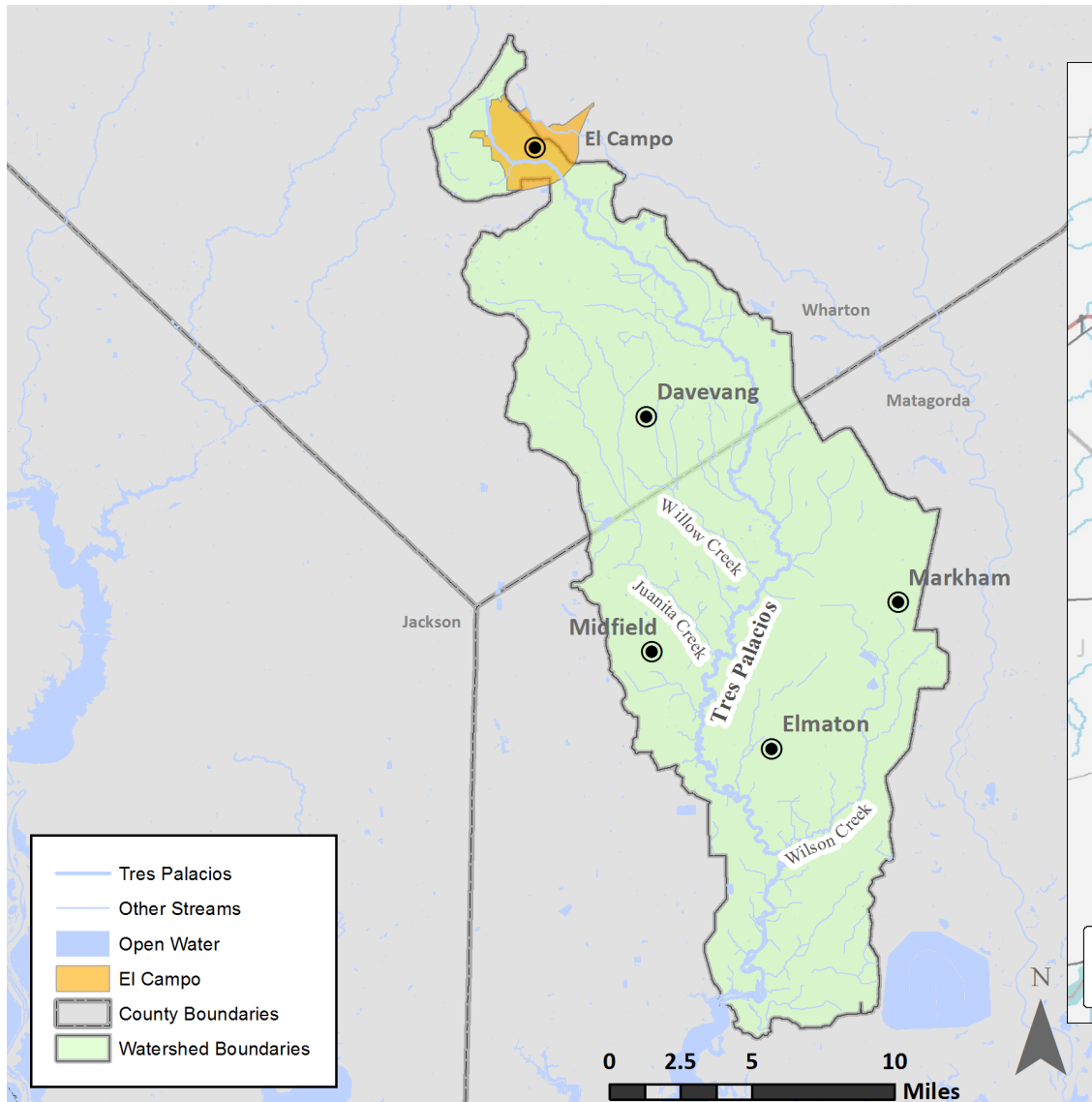


TPDES Permit No.	Facility	Held By	AU	Receiving Waters	Discharge Type	Permitted Discharge <sup>a</sup> (MGD)	Recent Discharge (MGD)
WQ0005009000	Apex Matagorda Energy Center	Apex Matagorda Energy Center, LLC	1502_01	Tres Palacios Creek Above Tidal	wastes from a compressed air energy storage facility	0.223 (daily avg)	0.079 <sup>b</sup>
WQ0010844001	City of El Campo Wastewater Treatment Facility	City of El Campo	1502_02	Tres Palacios Creek Above Tidal	treated domestic wastewater	2.628 (annual avg)	1.015 <sup>b</sup>
WQ0013091001	Midfield Wastewater Treatment Facility	Midfield Water Supply Corporation	1502_03	an unnamed tributary; thence to Wallace Creek; thence to Tres Palacios Creek Above Tidal	treated domestic wastewater	0.03 (daily avg)	0.016 <sup>b</sup>
WQ0015075001	Markham MUD Wastewater Treatment Facility	Markham Municipal Utility District	1501_01	an unnamed ditch; thence to Wilson Creek; thence to Tres Palacios Creek Tidal	treated domestic wastewater	0.3 (daily avg)	0.045 <sup>c</sup>

# Groundwater Resources



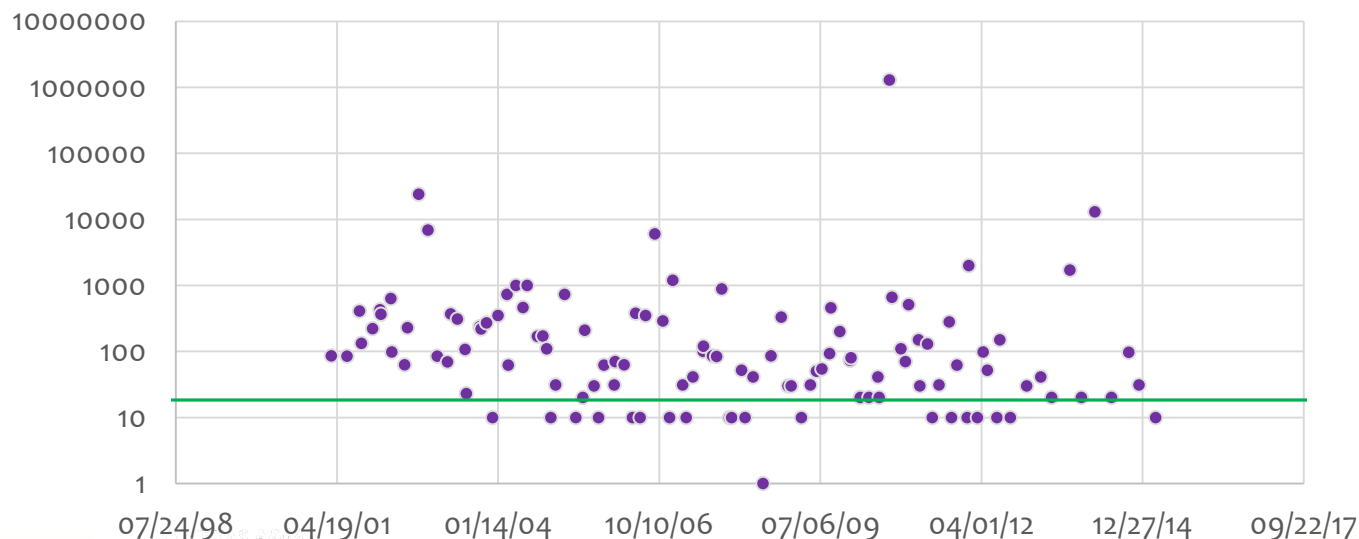
# Surface Water



# Bacteria

Data used for:	Parameter	ASMT Start Date	ASMT End Date	# of samples	Geometric Mean	Criteria	Designated Use
Assessment	Enterococcus	12/1/2005	11/30/2012	64	67.19	35.00	Recreation
All Data	Enterococcus	3/14/2001	3/17/2015	115	92.42	35.00	Recreation

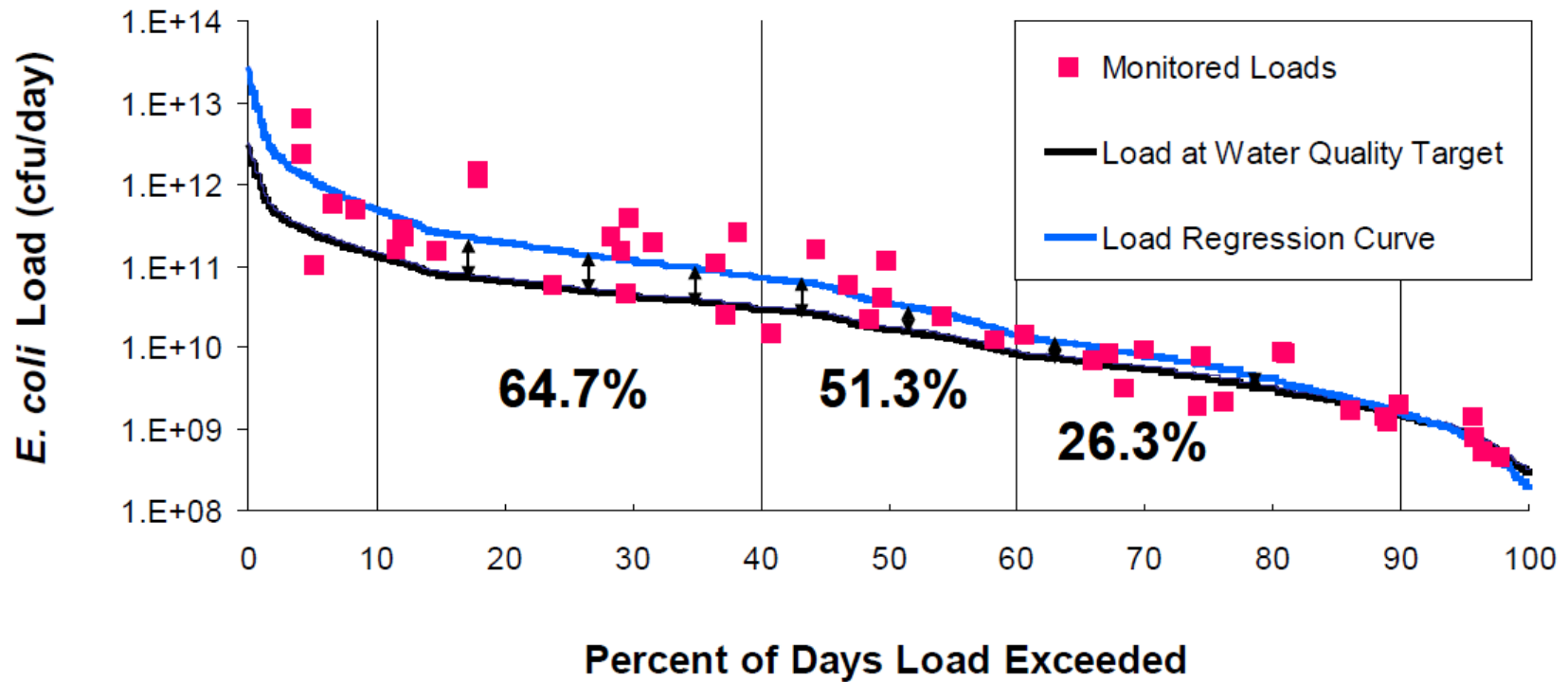
Bacteria Levels



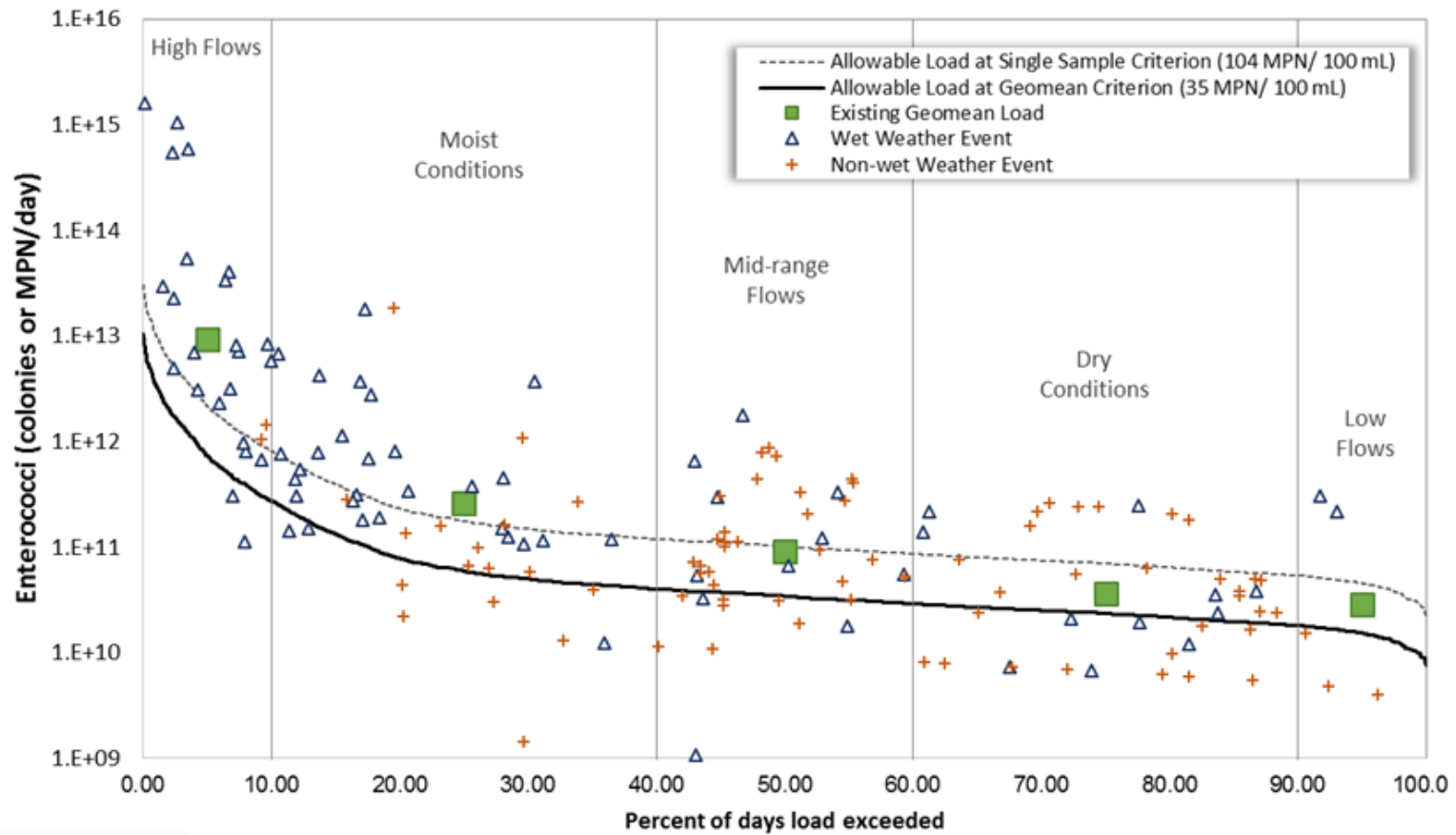
# Chapter 3 – Estimates of Pollutant Source Loads and Needed Load Reductions



# Loading Reductions

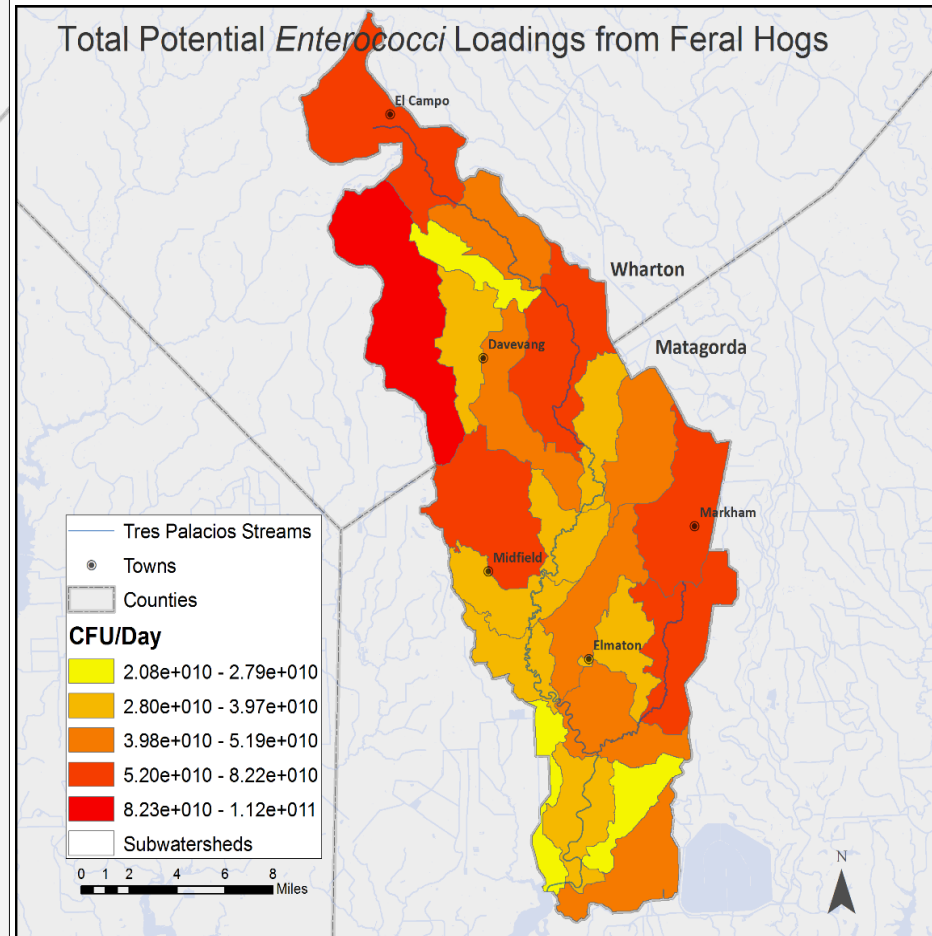
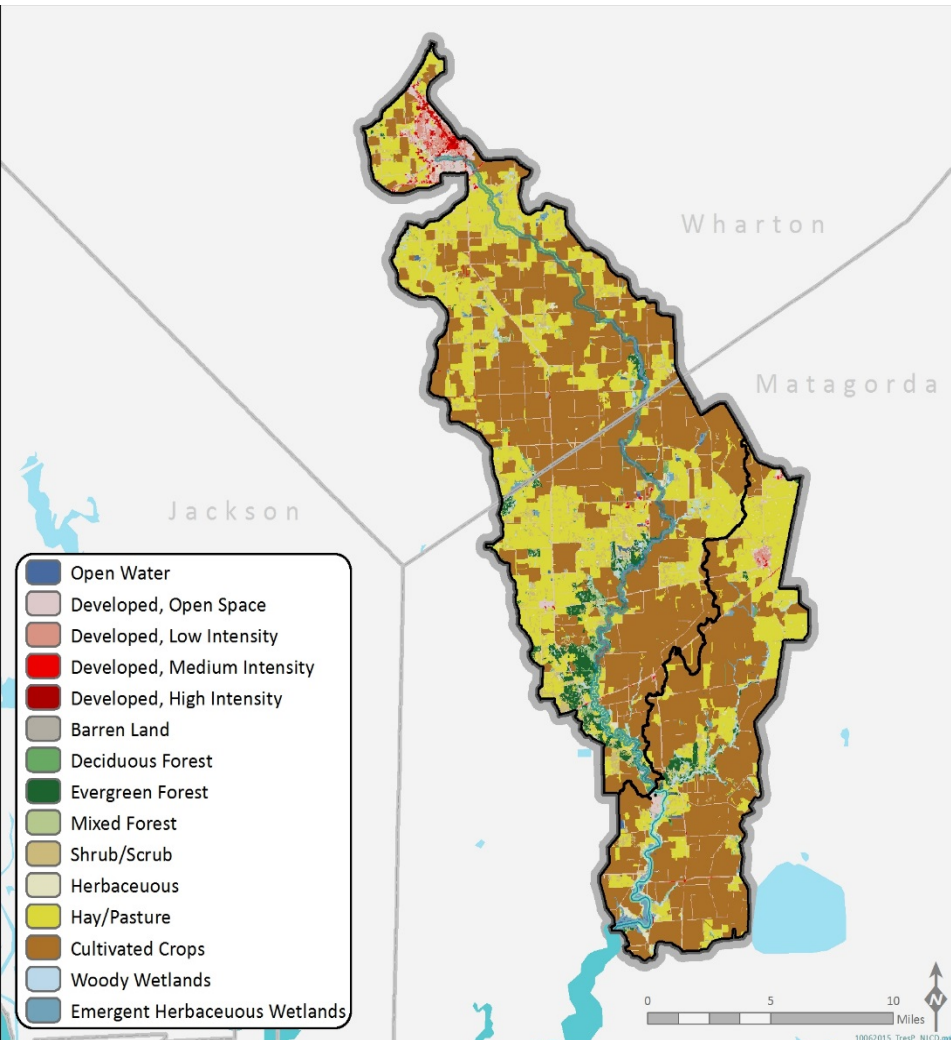


# Current Load Duration Curves



Station 12515

# Estimated Daily Potential Loadings



# Estimated Livestock and Wildlife in Tres Palacios Watershed

Estimated Numbers of livestock and wildlife in the Tres Palacios Watershed					
	Matagorda	Wharton	Total	AU Conversion	AUs
Horses	101	148	249	1.25	312
Goats	76	64	140	0.17	24
Sheep	27	35	62	0.2	12
Poultry	4	6	10	0.01	0.11
Feral Hogs	3,338	1,868	5,206	0.125	651
Deer	5,798	3,245	9,042	0.112	1012

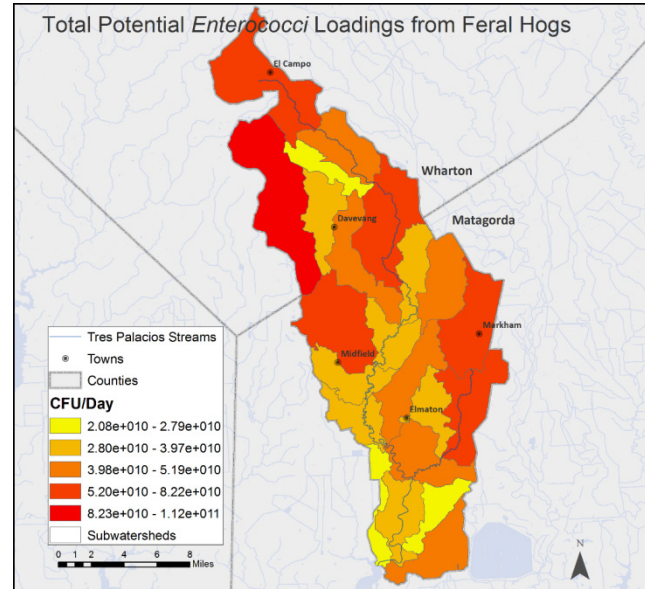
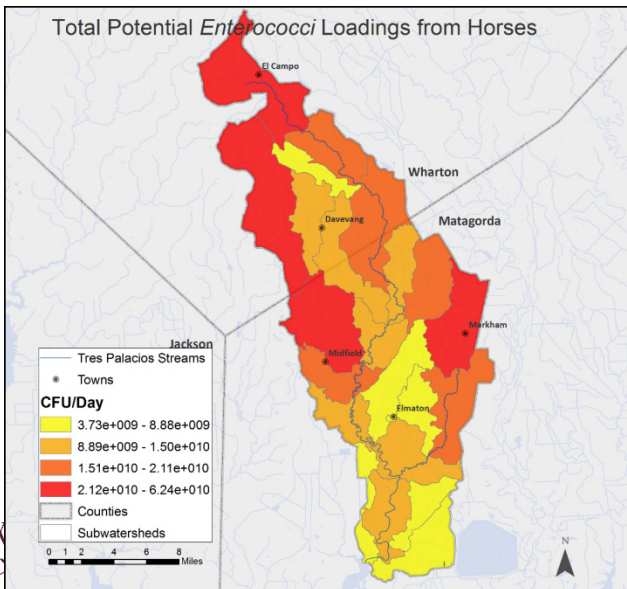
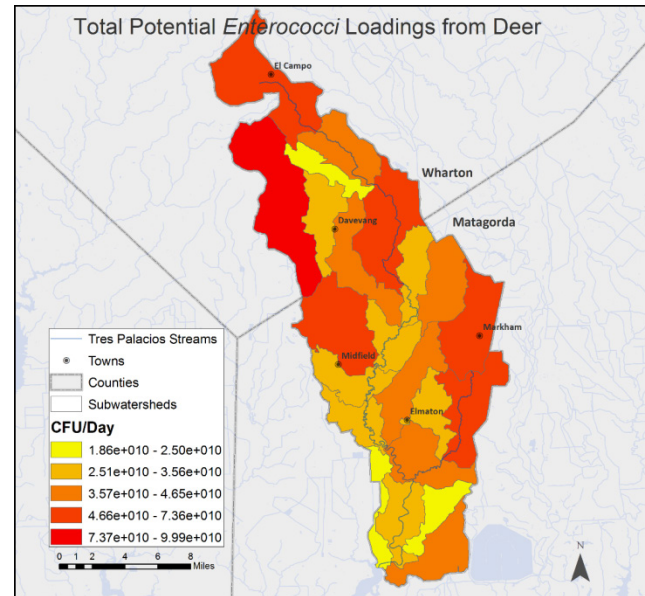
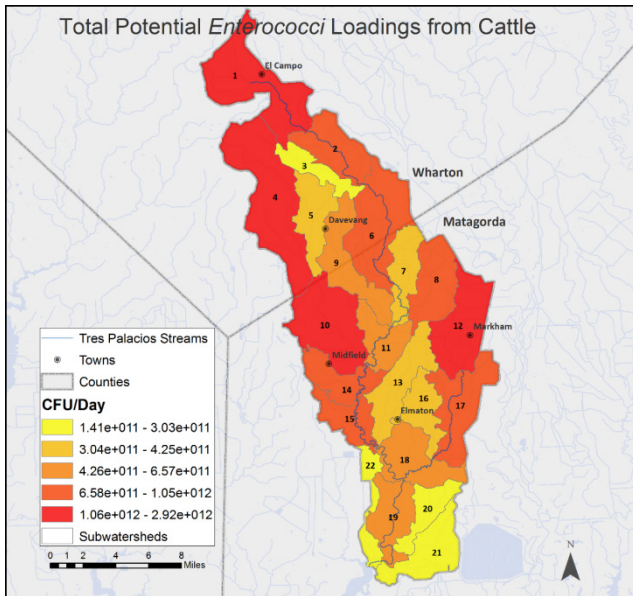
# Cattle Estimates

Land Type	Method	Acres	Stocking Rate (cattle/acre)	Cattle Estimates	AU Conversion	AU
Unimproved	Stocking rate	15,378	1/7	2,197	1	2,197
Improved	Stocking rate	50,279	1/3	16,760	1	16,760
<b>Total</b>	<b>Stocking rate</b>	<b>65,657</b>	<b>N/A</b>	<b>18,957</b>	<b>1</b>	<b>18,957</b>
<b>Overall</b>	<b>NASS</b>	<b>65,657</b>	<b>N/A</b>	<b>9,752</b>	<b>1</b>	<b>9,752</b>

# Estimated Household Pets

Watershed	Segment	Estimated Number of Households	Estimated Dog Population	Estimated Cat Population
Tres Palacios Creek	Tidal (1501)	888	519	567
	Above Tidal (1502)	5,108	2,983	3,259
	Total	5,996	3,502	3,825

# Potential Daily Loadings



# Chapter 4 – Strategies for Watershed Protection Plan Implementation



# Most Common Management Measures

- ⦿ Wastewater management:
  - ⦿ WWTF Improvements
  - ⦿ Replacement of Failing Wastewater Collection System Infrastructure
  - ⦿ Develop and implement SSO Plans
  - ⦿ Repair/replace/remove OSSFs
- ⦿ Urban stormwater management :
  - ⦿ Stormwater BMP implementation
- ⦿ Ag management:
  - ⦿ Develop and implement WQMPs & Conservation Plans

# Other Management Measures

- ⦿ Wildlife Management
- ⦿ Feral Hog Management
- ⦿ Illegal Dumping
- ⦿ Pets & Urban Wildlife Management
- ⦿ Wetland/Habitat/Stream Restoration

# Chapter 5 – Sources for Watershed Protection Plan Implementation



# Chapter 5 Handout

Management Measure	Technical Assistance
MM 1: Develop and implement conservation plans in priority areas of the watershed	TSSWCB, Texas AgriLife, NRCS, and TPWD
MM 2: Explore Feasibility of Altering Tax Exemption Requirements for Small Acreage Landowners	Texas Comptroller of Public Accounts office to ensure that all requirements of the tax code have been met
MM 3: Promote the Management of and Control Feral Hog Populations	Texas A&M AgriLife Extension Service Texas Wildlife Services
MM 4: Promote the Reduction of Illicit Dumping and Proper Disposal of Animal Carcasses	Texas A&M AgriLife County Extension Agents TCEQ Region 14 TCEQ Small Business and Local Government Assistance Program
MM 5: Identify OSSFs, Prioritize Problem Areas, and Systematically Work to Bring Failing Systems into Compliance	TCEQ Region 14 TCEQ Small Business and Local Government Assistance Program
MM 6: Promote the Improved Quality of and Management of Urban Stormwater	TCEQ Region 14
MM 7: Coordinate Efforts to Reduce Unauthorized Discharges	TCEQ Region 14
MM 8: Reduce WWTF Contributions by Meeting Half of the Permitted Bacteria Limit	TCEQ, TEEX
MM 9: Monitoring of WWTF Effluent to Ensure Permit Compliance	TCEQ permit compliance assistance TEEX – WWTF operation and maintenance TRWA – sample collection and handling Private Engineering firms – general civil engineering services
MM 10: Improve and Upgrade WWTFs	TCEQ permit compliance assistance TEEX – WWTF operation and maintenance TRWA Private Engineering firms – general civil engineering services

Management Measure	Financial Assistance Program
MM 1: Develop and implement conservation plans in priority areas of the watershed	Agricultural Conservation Easement Program (ACEP) Agricultural Food Research Initiative Competitive Fellowship Grants Program Coastal Wetlands Conservation Grants Coastal Zone Management Administration (CZMA) Awards Conservation Innovation Grants Conservation Stewardship Program (CSP) Environmental Education Grants Environmental Quality Incentives Program (EQIP) Farm Business Management and Benchmarking (FBMB) Program Federal and State CWA §319(h) Grants (USEPA/TCEQ/TSSWCB) Integrated Programs National Integrated Water Quality Program (NIWQP) Regional Conservation Partnership Program (RCPP) Sustainable Agriculture Research & Education (SARE) Targeted Watershed Grants Program
MM 2: Explore Feasibility of Altering Tax Exemption Requirements for Small Acreage Landowners	State CWA §319(h) Grants (TCEQ/TSSWCB)
MM 3: Promote the Management of and Control Feral Hog Populations	State CWA §319(h) Grants (TSSWCB) or other available opportunities Texas Department of Agriculture (TDA) Texas Wildlife Services
MM 4: Promote the Reduction of Illicit Dumping and Proper Disposal of Animal Carcasses	State CWA §319(h) Grants (TCEQ/TSSWCB) USDA Rural Utilities Service Water and Waste Disposal Loans and Grants
MM 5: Identify OSSFs, Prioritize Problem Areas, and Systematically Work to Bring Failing Systems into Compliance	Coastal Impact Assistance Program (CIAP) Coastal Management Program (CMP) and National Coastal Zone Management Program (CZM) State CWA §319(h) grants (TCEQ)
MM 6: Promote the Improved Quality of and Management of Urban Stormwater	Clean Water State Revolving Fund (CWSRF) Environmental Education Grants State CWA §319(h) Grants (TCEQ) Urban Water Small Grants
MM 7: Coordinate Efforts to Reduce Unauthorized Discharges	Clean Water State Revolving Fund (CWSRF) Economically Distressed Areas Program (EDAP) Water and Waste Disposal Loans and Grants
MM 8: Reduce WWTF Contributions by Meeting Half of the Permitted Bacteria Limit	Clean Water State Revolving Fund (CWSRF) Economically Distressed Areas Program (EDAP) Water and Waste Disposal Loans and Grants
MM 9: Monitoring of WWTF Effluent to Ensure Permit Compliance	Clean Water State Revolving Fund (CWSRF) Economically Distressed Areas Program (EDAP) Water and Waste Disposal Loans and Grants
MM 10: Improve and Upgrade WWTFs	Clean Water State Revolving Fund (CWSRF) Economically Distressed Areas Program (EDAP) Existing local funding for wastewater improvements Water and Waste Disposal Loans and Grants

# Chapter 5 – Other Components

- ⦿ Education and outreach
  - ⦿ Watershed coordinator
  - ⦿ Educational programs and training
  - ⦿ Public service announcements
  - ⦿ Direct mailings
  - ⦿ Others



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## Questions/Discussion

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