Oso Creek Watershed Public Meeting

Improving Water Quality in Oso Creek

A TMDL Project to Protect Recreational Uses

Thursday, June 26th, 2014

Texas Stream Team and Watershed Services

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Texas Stream Team
Watershed Services Program
International Watershed Studies

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- Background on The Meadows Center for Water & The Environment
  - Texas Stream Team
  - Watershed Services
- Citizen Monitoring Efforts on Oso Creek
- Future Activities?


The Meadows Center
for Water and the Environment

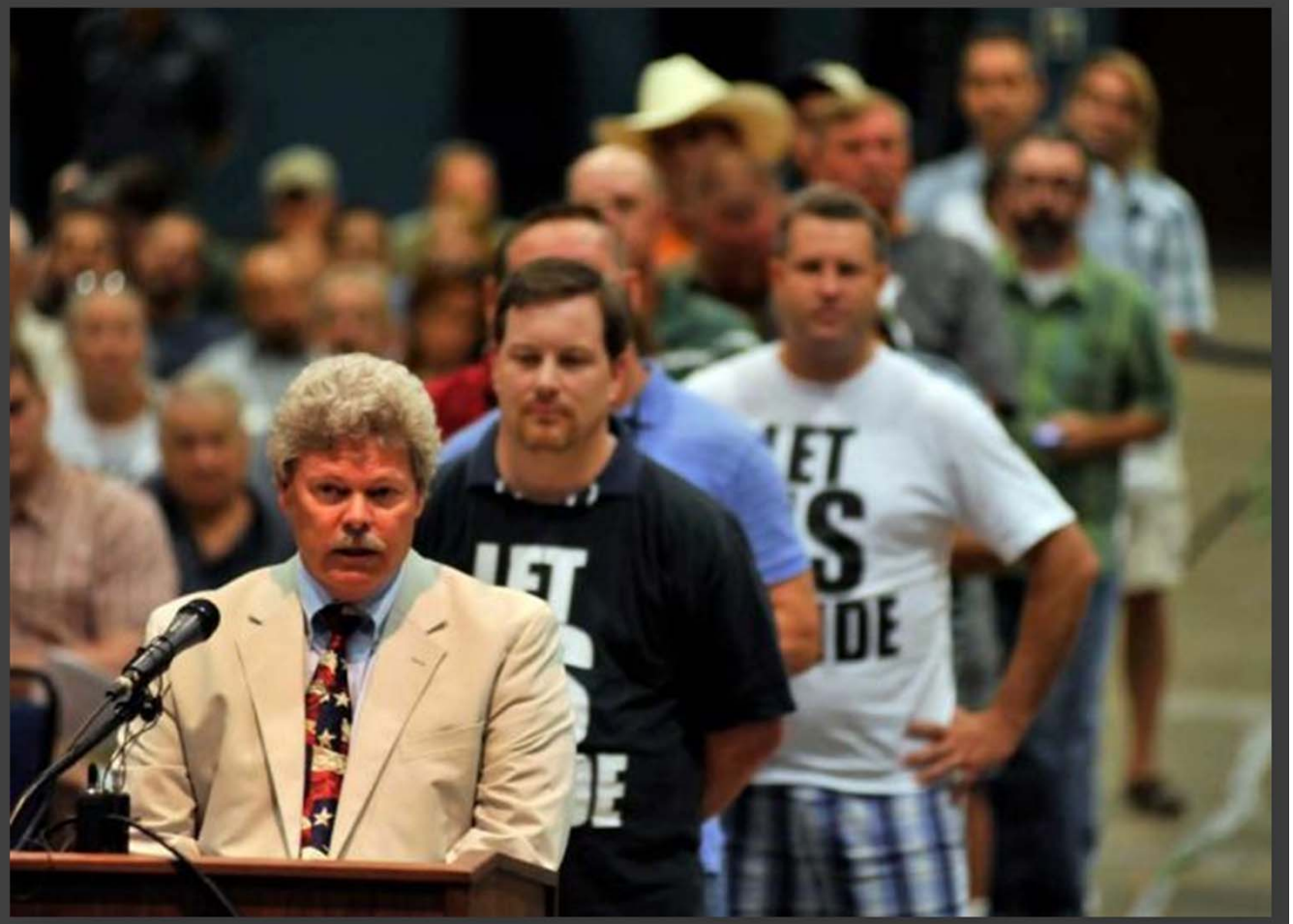

Research
Education
Service and Conservation
Stewardship
AQUARENA CENTER
SAN MARCOS, TEXAS

Research & Stewardship

- Environmental Flows
- Watershed Modeling
- Watershed Protection and Management
- Conservation

Education, Service and Conservation

- Texas Stream Team
- Facilitation
- Watershed Services
- Grant Writing & Management



Texas Stream Team

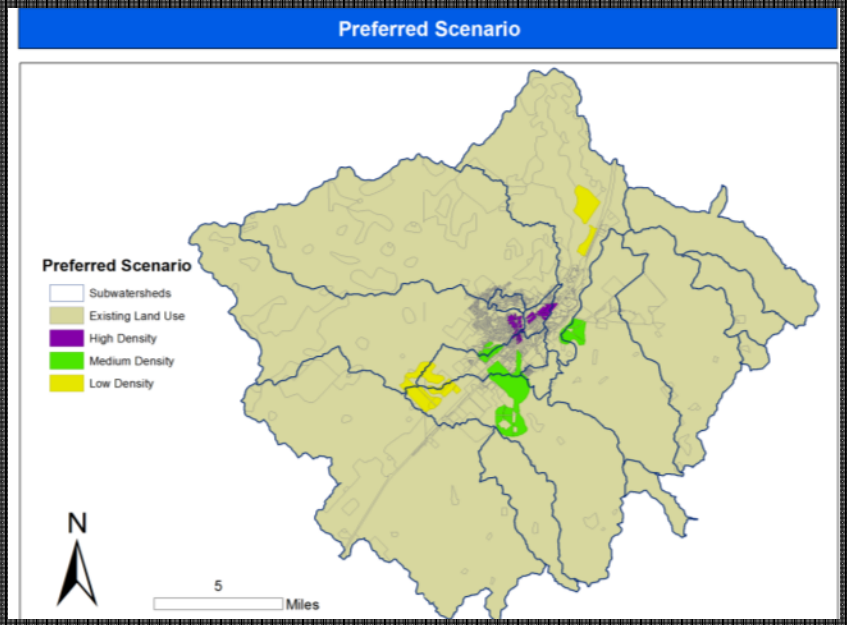
Texas Stream Team

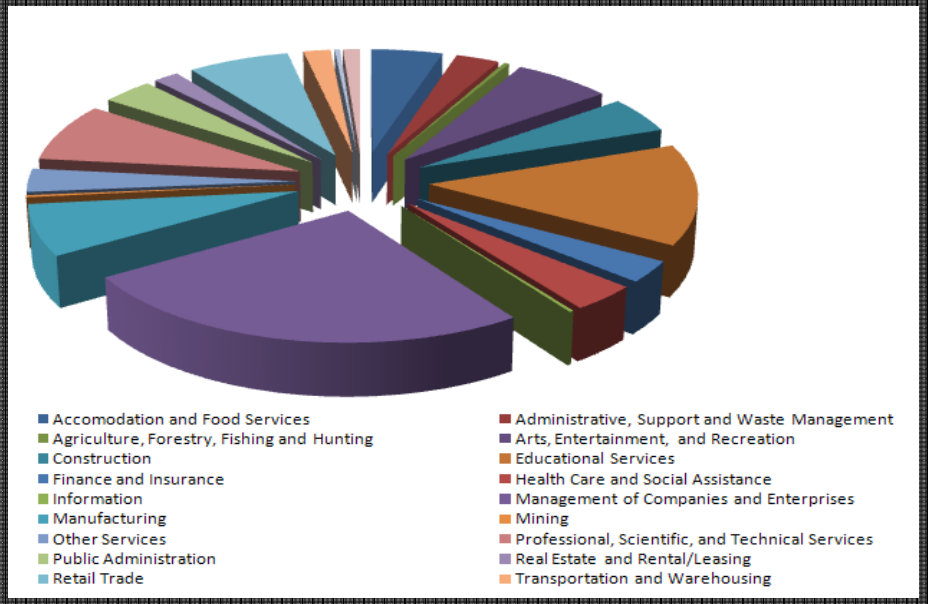
Network of trained volunteers and supportive partners working together to gather information about natural resources

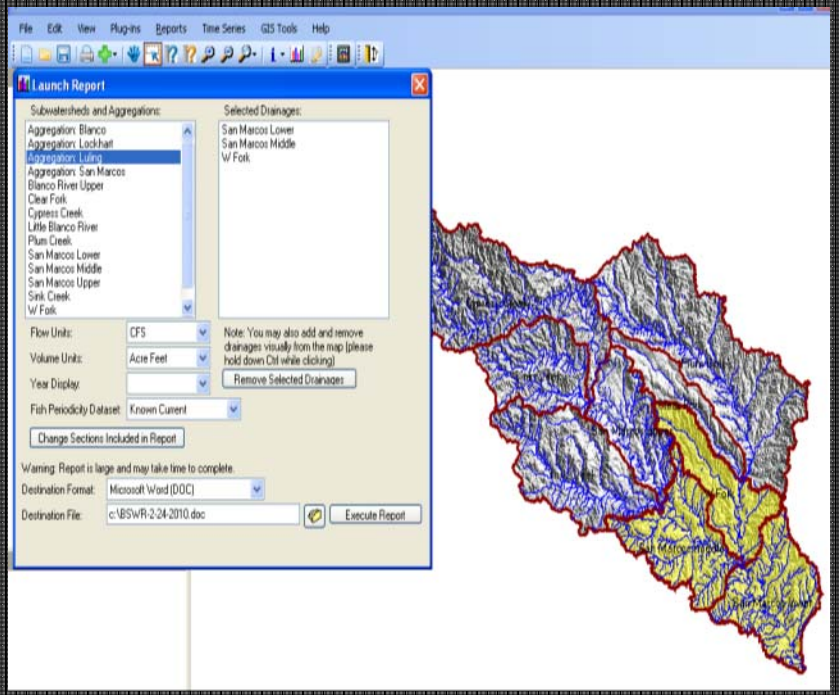
- Routine water quality monitoring
- Point source and issue specific water quality monitoring, community projects
- Bioassessments
- TST Paddling Program
- Education and Outreach
- Citizen Science

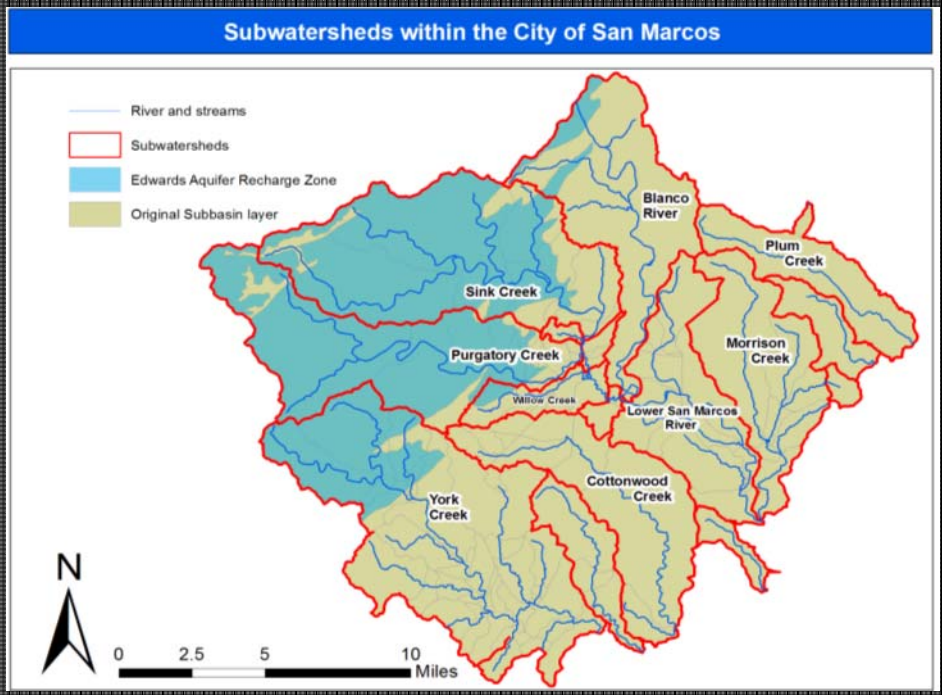
Watershed Modeling

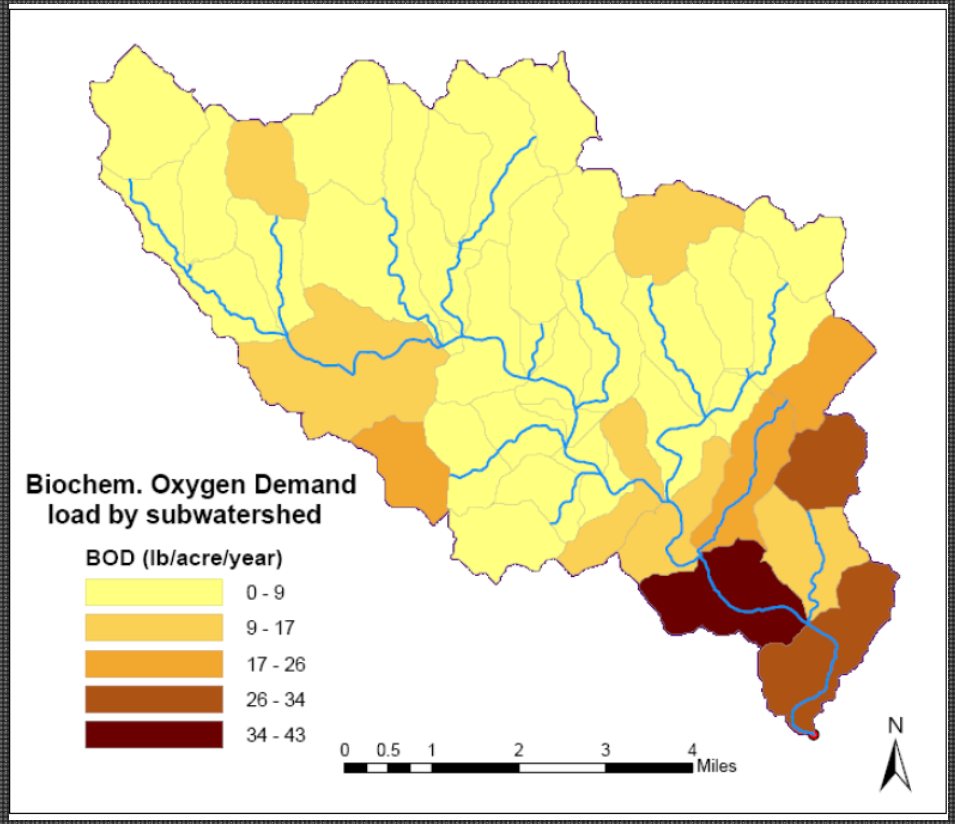
- Watershed Characterization
  - Habitat characterization and delineation
- Distributed Rainfall-Runoff
- Water Quality and Ecological Impacts due to changes in Land Use and Land Cover
- Pollutant load reductions of BMPs and TMDL planning activities
- Economic impact of water pollution and restoration

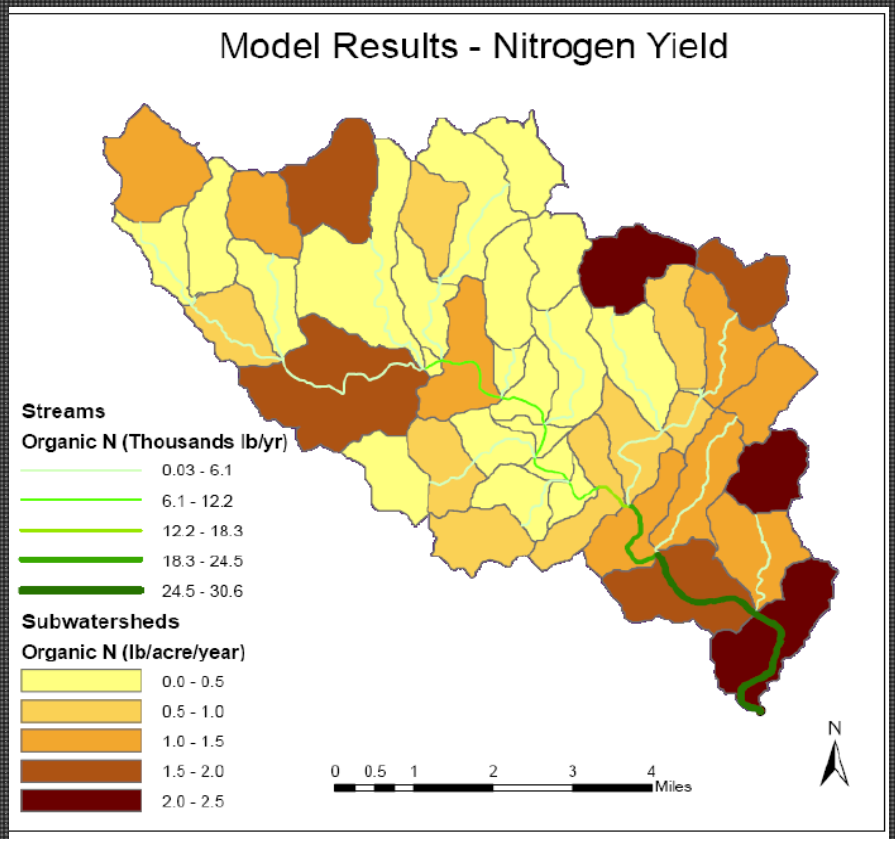

Preferred Scenario
Preferred Scenario
Subwatersheds
Existing Land Use
High Density
Medium Density
Low Density
N
5
Miles

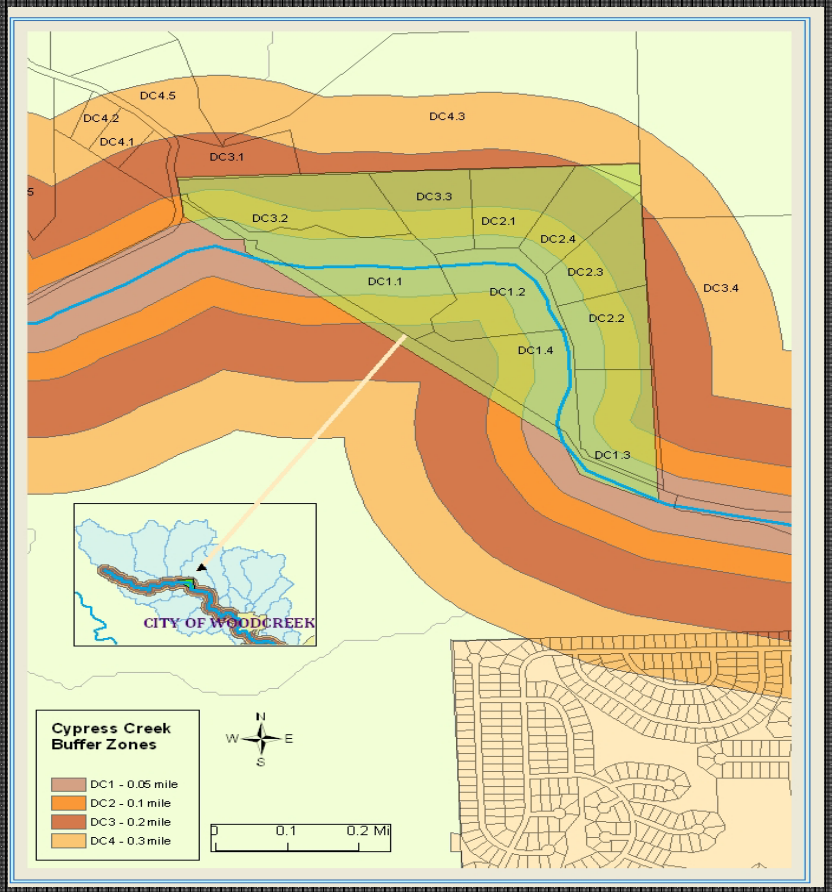

Accomodation and Food Services
Agriculture, Forestry, Fishing and Hunting
Construction
Finance and Insurance
Information
Manufacturing
Other Services
Public Administration
Retail Trade
Administrative, Support and Waste Management
Arts, Entertainment, and Recreation
Educational Services
Health Care and Social Assistance
Management of Companies and Enterprises
Mining
Professional, Scientific, and Technical Services
Real Estate and Rental/Leasing
Transportation and Warehousing

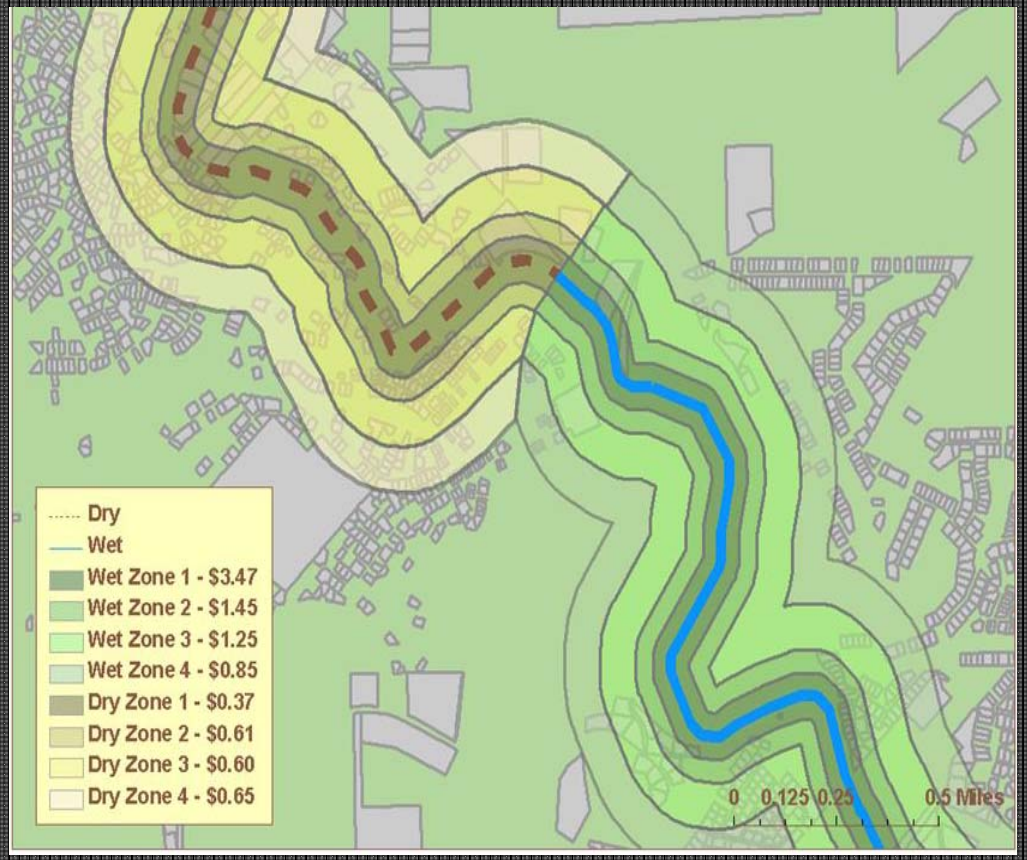

File Edit View Plug-ins Reports Time Series GIS Tools Help
Launch Report
Subwatersheds and Aggregations:
Selected Drainages:
Aggregation: Blanco
Aggregation: Lockhart
Aggregation: Luling
Aggregation: San Marcos
Blanco River Upper
Clear Fork
Cypress Creek
Little Blanco River
Plum Creek
San Marcos Lower
San Marcos Middle
San Marcos Upper
Sink Creek
W Fork
San Marcos Lower
San Marcos Middle
W Fork
Flow Units: CFS
Volume Units: Acre Feet
Year Display:
Fish Periodicity Dataset: Known Current
Note: You may also add and remove drainages visually from the map (please hold down Ctrl while clicking)
Remove Selected Drainages
Change Sections Included in Report
Warning: Report is large and may take time to complete.
Destination Format: Microsoft Word (DOC)
Destination File: c:\BSWR-2-24-2010.doc
Execute Report


Subwatersheds within the City of San Marcos
River and streams
Subwatersheds
Edwards Aquifer Recharge Zone
Original Subbasin layer
Blanco River
Plum Creek
Sink Creek
Morrison Creek
Purgatory Creek
Willow Creek
Lower San Marcos River
Cottonwood Creek
York Creek
N
0
2.5
5
10
Miles


Biochem. Oxygen Demand load by subwatershed
BOD (lb/acre/year)
0 - 9
9 - 17
17 - 26
26 - 34
34 - 43
0 0.5 1 2 3 4
Miles
N


Model Results - Nitrogen Yield
Streams
Organic N (Thousands lb/yr)
0.03 - 6.1
6.1 - 12.2
12.2 - 18.3
18.3 - 24.5
24.5 - 30.6
Subwatersheds
Organic N (lb/acre/year)
0.0 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 2.5
0 0.5 1 2 3 4
Miles
N


DC4.5
DC4.2
DC4.1
DC4.3
DC3.1
DC3.3
DC3.2
DC2.1
DC2.4
DC2.3
DC1.1
DC1.2
DC3.4
DC2.2
DC1.4
DC1.3
CITY OF WOODCREEK
Cypress Creek Buffer Zones
DC1 - 0.05 mile
DC2 - 0.1 mile
DC3 - 0.2 mile
DC4 - 0.3 mile
N
W
E
S
0
0.1
0.2 Mi


Dry
Wet
Wet Zone 1 - $3.47
Wet Zone 2 - $1.45
Wet Zone 3 - $1.25
Wet Zone 4 - $0.85
Dry Zone 1 - $0.37
Dry Zone 2 - $0.61
Dry Zone 3 - $0.60
Dry Zone 4 - $0.65
0
0.125
0.25
0.5 Miles

Watershed Services

- Community activity and work plan facilitation
- Technical expertise
- GIS
- Report generation
- Branding, outreach
- Contract management

CYPRESS CREEK
Let's keep it clean, clear & flowing

SAN MARCOS
WATERSHED INITIATIVE

Information, Education, and Outreach Plan

San Marcos Watershed Initiative – March 2014

This draft plan will increase the involvement of residents who live in the communities of the San Marcos watershed in local stewardship and watershed protection activities through awareness, education, and action.

Vulnerable Tributary Groups

within the Cypress Creek Watershed

Group C

- Located within the upper & western Dry portions
- Drains agricultural lands with high runoff yields
- Vulnerable to sedimentation from runoff, and nutrients & bacteria from livestock & animal waste.

Group A

- Mostly located within Wet portion
- Drains areas of high-intensity commercial and residential development
- Vulnerable to nutrients from fertilizer use, bacteria from pet/animal & untreated human waste, and oil & grease from roadways.

Group B

- Located within Wet portion
- Drains areas with high likelihood of medium & high-density residential development
- Vulnerable to sedimentation from development, nutrients from fertilizer use & pet/animal & untreated human waste, and oil & grease from roadways.

Dry Portion

Wet Portion

Hays County, Texas

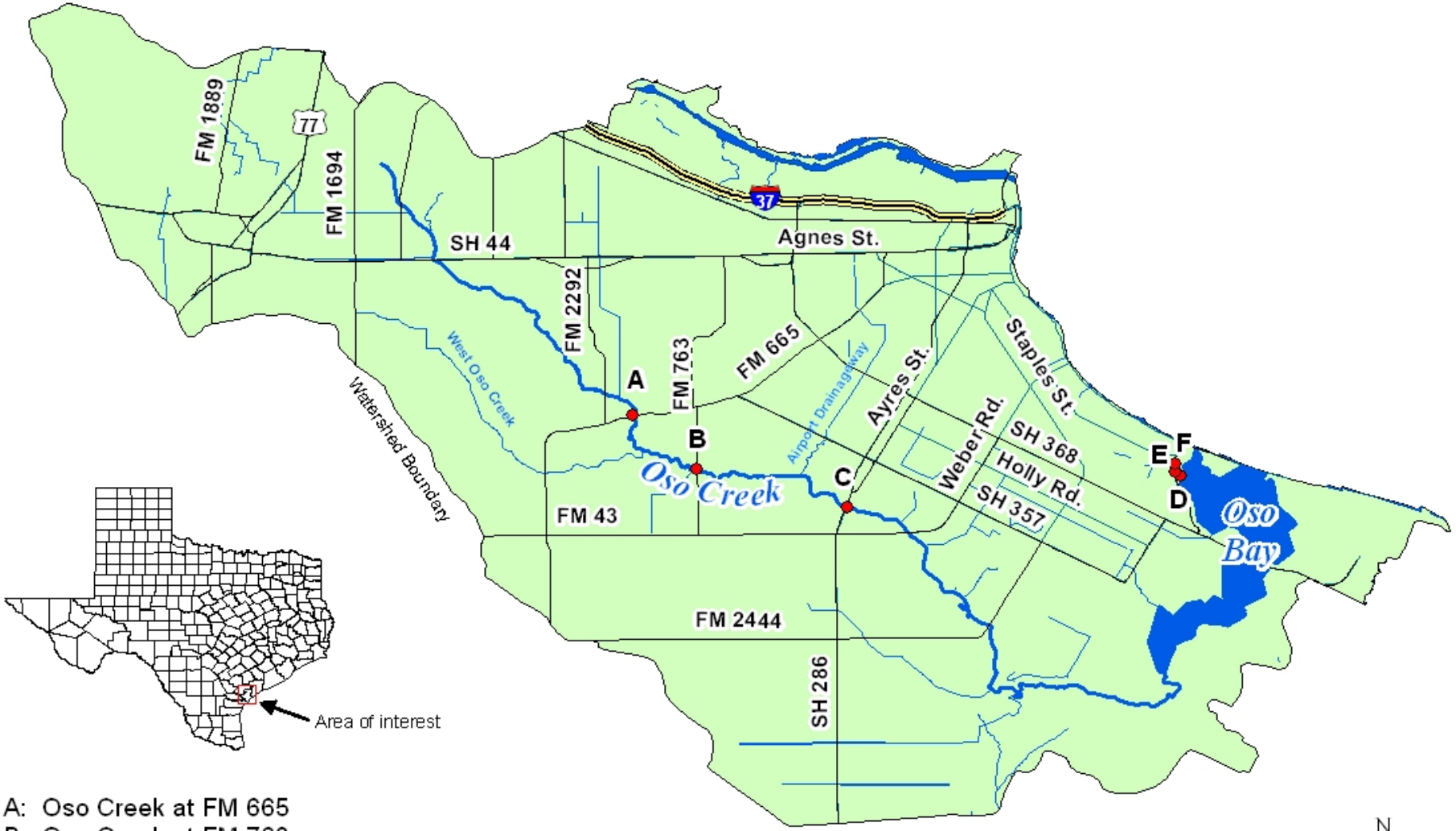
N

1 0.5 0 1 2 3 Miles

Previous Monitoring in Oso Creek

- David Boylan, the citizen monitoring coordinator of the Lindheimer Master Naturalists, collected data at three sites on Oso Creek from October 2008 to February 2010
- Students from TAMU-CC collected data at three sites on the discharge flow from the Oso Wastewater Treatment Plant near Oso Bay from February 2009 to April 2009.
- A few samples on Oso Creek were collected by Texas A&M Corpus Christi students
- Only E. coli and conductivity data were collected at Oso Creek, and only E. coli data were collected at Oso Bay.

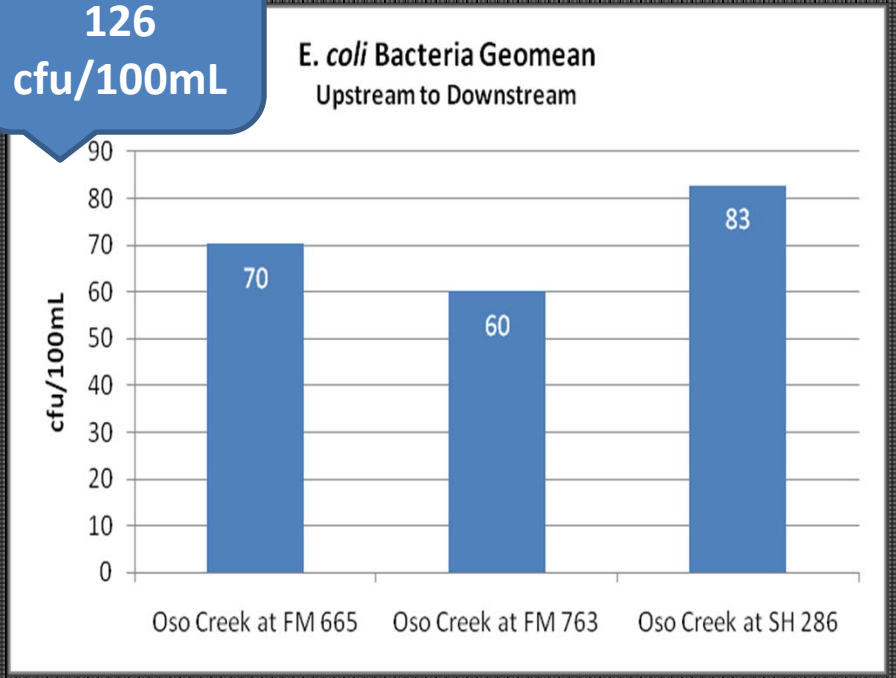
Oso Creek/Oso Bay
Citizen Water Quality Monitor Site Locations



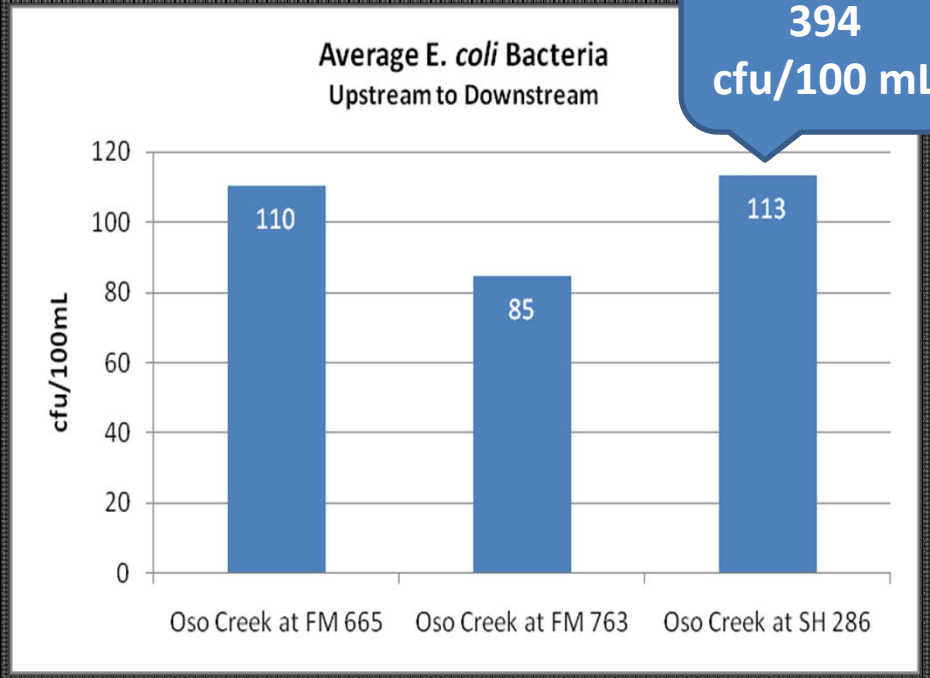
Previous Monitoring in Oso Creek

Oso Creek						
Parameter	**#**	**% Complete**	**Min**	**Avg**	**Max**	**Std Dev**
E. *coli* Bacteria	68	97	33	103	533	105
Conductivity	38	54	400	3114	5800	1234

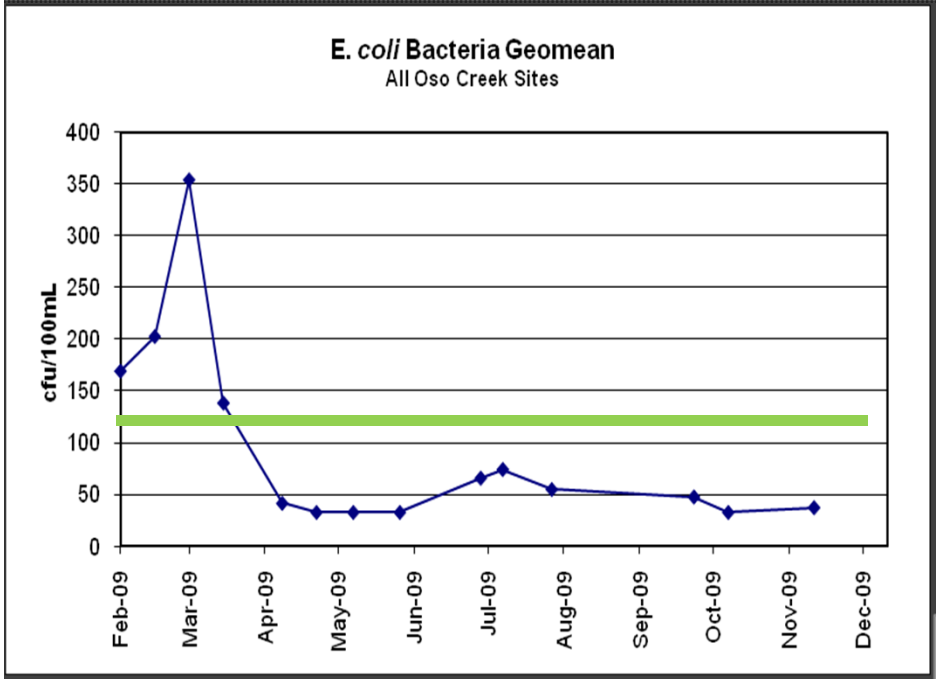
Standard = 126 cfu/100mL



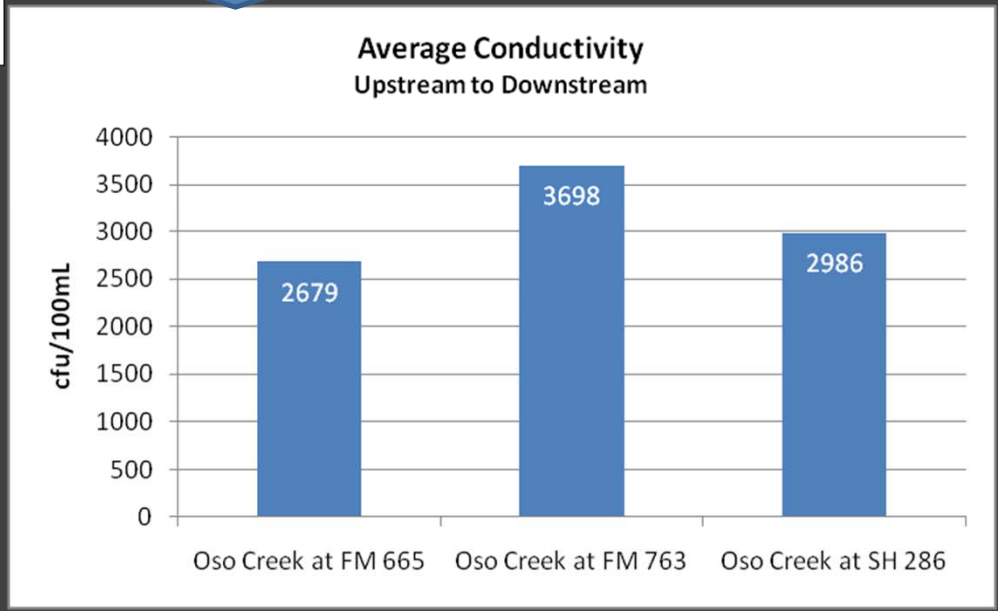
Standard = 394 cfu/100 mL



Previous Monitoring in Oso Creek



High tide?



Previous Monitoring in Oso Creek

The data show Oso Creek to be suitable for contact recreation.

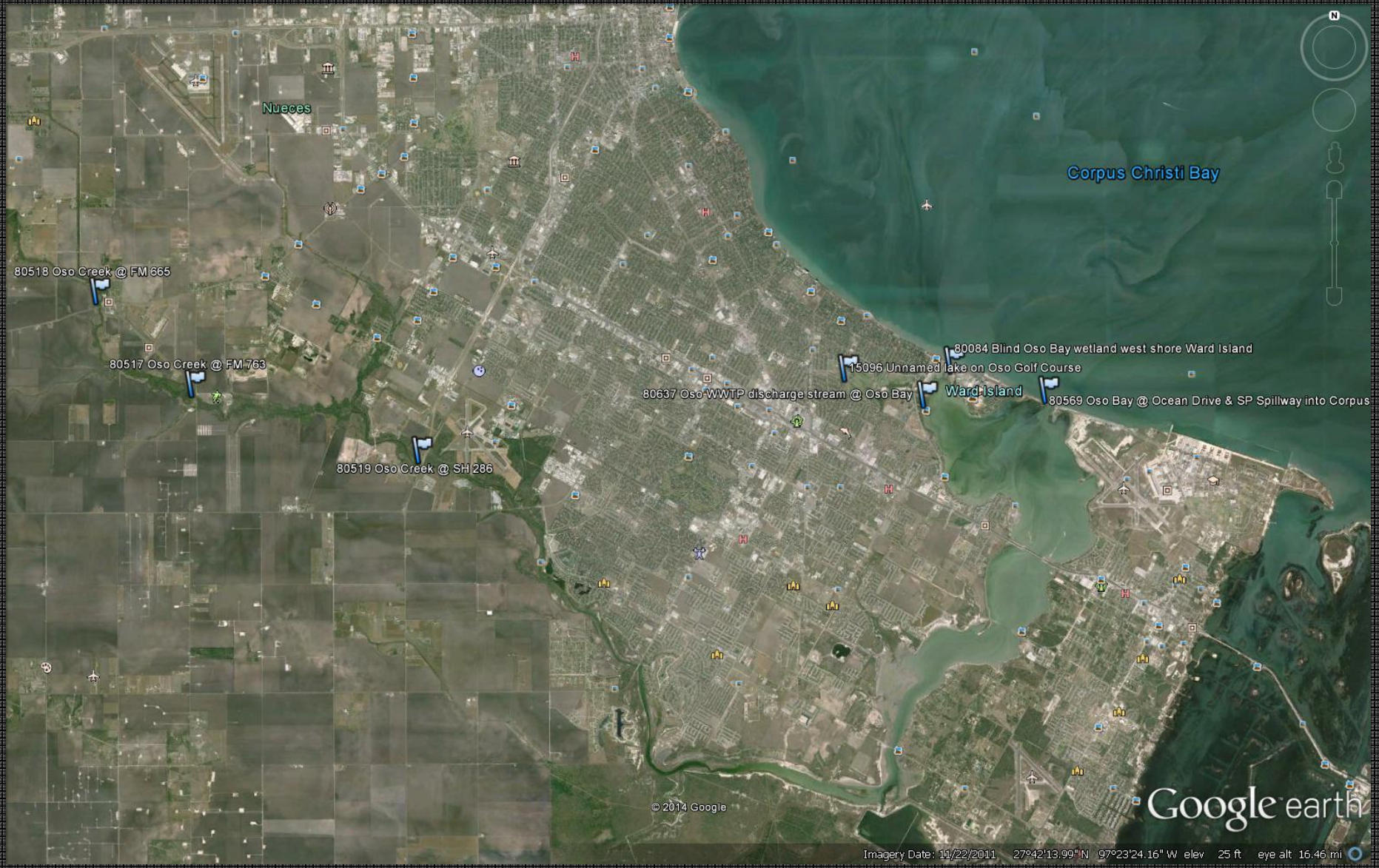
- Only 2 of 68 E. coli samples between Oct 08 and Nov 09 were over the single sample standard of 394 cfu/100 mL.
  * Both observed on 11/11/2008, FM 665 and FM 763 sites.
- Eighteen samples were over the geomean standard, used only as a reference point since these are single samples.
- The geomean for all three sites is 70.7 cfu/100mL, well below the geomean standard of 126 cfu/100mL.

Previous Monitoring in Oso Creek

The difference between citizen water quality monitor data and professional data…

- **E. *coli* grows at an attenuated rate in the presence of high concentrations of salt.**
- Oso Creek is under tidal influence from Oso Bay.
- The average conductivity of 3,114 µS/cm indicates that samples may have been collected at high tide.

Current but Inactive TST Sites



Where do we go from here?

- Identify important routine and targeted water quality monitoring sites
- Form TST group to monitor!
- Intensive, targeted and watershed level E. *coli* monitoring
- Education and outreach?
- Community engagement, branding, reporting?

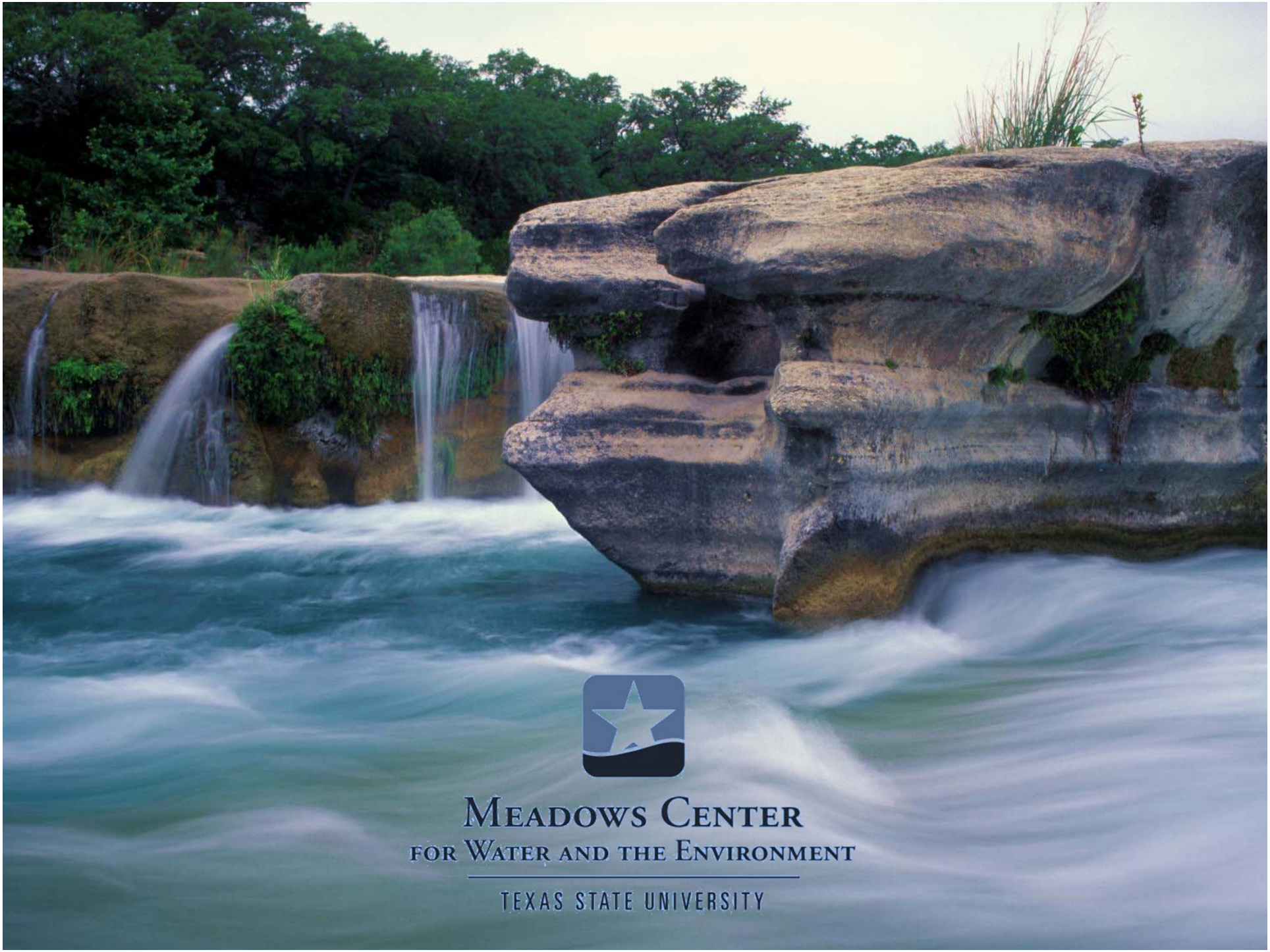
Where do we go from here?

- Assistance with other TMDL activities?
- Assistance with Implementation activities?

What do YOU need help with?

Questions?

Thank you!


MEADOWS CENTER
FOR WATER AND THE ENVIRONMENT
TEXAS STATE UNIVERSITY