



THE MEADOWS CENTER FOR WATER AND THE ENVIRONMENT

No natural resource is more important to our future than Water. Water is what we do.

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FOR WATER AND THE ENVIRONMENT

TEXAS STATE UNIVERSITY

Planning for Growth in Comal County

Greater Edwards Aquifer Alliance

February 2, 2017

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Regional Watershed Planning Efforts, Lessons Learned and Empowering Citizens



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Goal: Insights into Watershed Management

1. Background
2. Lessons learned
3. Moving forward



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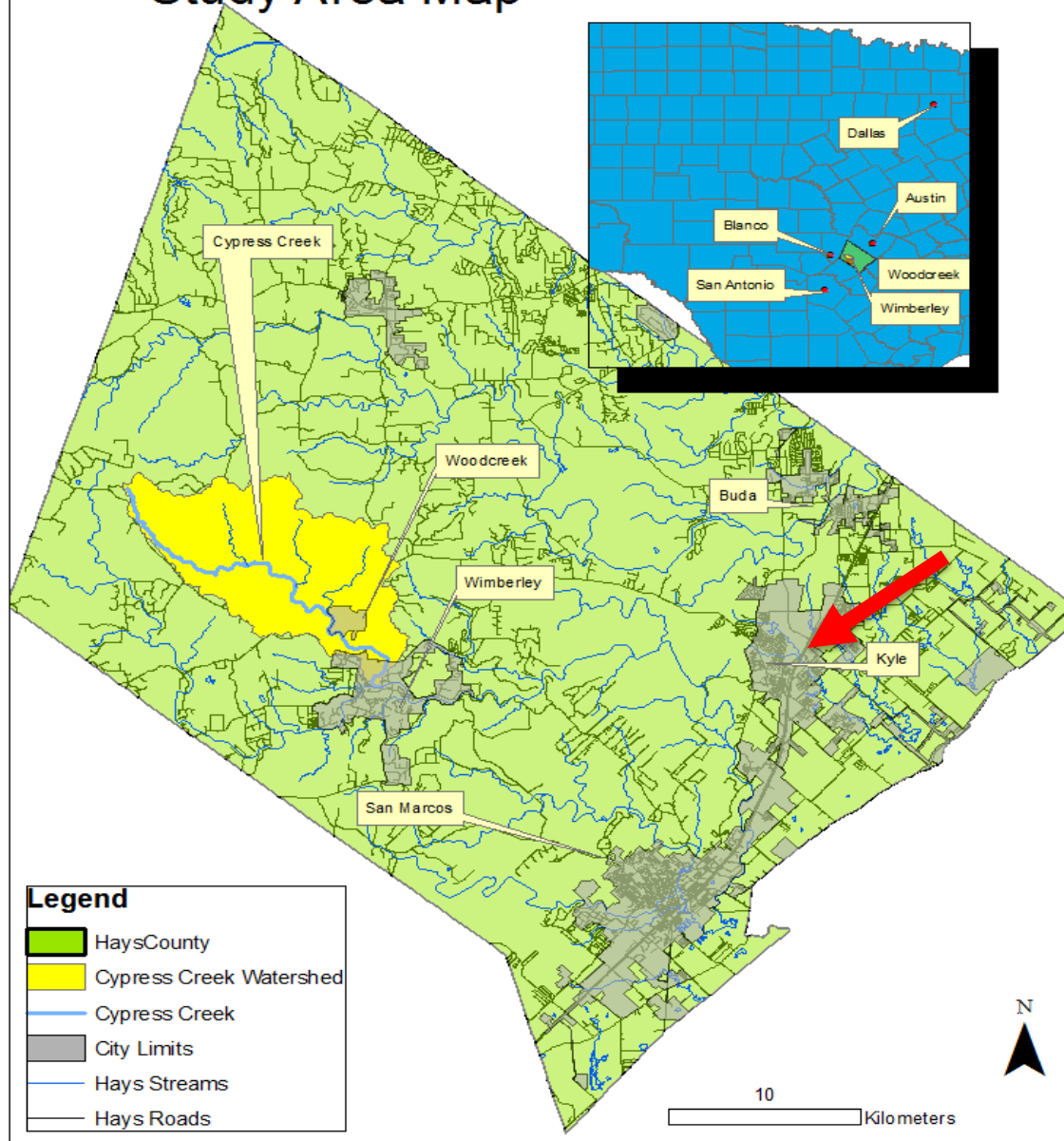
The Meadows Center for Water and the Environment
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CYPRESS CREEK

Let's keep it clean, clear & flowing

Cypress Creek Watershed Study Area Map



- Background – Listed in 2000 for inadequate DO. That year the creek stopped flowing for the 1st time. Emerging issues with flow and bacteria.
- Stakeholder partnership formed, led by City of Wimberley, City of Woodcreek, Hays County, Wimberley Valley Watershed Association
 - Supported by The Meadows Center
- TCEQ 319 funding to develop a science-based, stakeholder driven Watershed Protection Plan

- Plan accepted by TCEQ and EPA
- Implementation grant funded
 - State/Federal Contribution \$804,843
 - Partner and stakeholder Contributions \$529,362
 - Total Cost: \$1,334,205
- Groundwater component, review of flooding issues



Cypress Creek Watershed Plan Components

- Structural BMPs
- Non-structural BMPs
- Source water protection
- Land management, conservation
- Community education
- Research
- Monitoring





SAN MARCOS

WATERSHED INITIATIVE

Upper San Marcos River Watershed

WIMBERLEY

Hays County

Comal County

Caldwell County



Legend

- Streams
- Roads
- Purgatory_Cr
- Sessom_Cr
- Sink_Cr
- Willow_Springs_Cr
- Counties
- Cities

Sink Creek

Lime Kiln Rd

Blanco River

RR 12

Sessom Creek

Spring Lake

SAN MARCOS

San Marcos River

Hwy 80

Purgatory Creek

Willow Springs Creek

I-35

Hwy 123

- In 2010, the Upper San Marcos River was cited on TCEQ's 303(d) list for exceeding total dissolved solids (TDS) water quality standards.
- Several other pollutants identified as a concern (nutrients, total suspended solids, bacteria, oil and grease).
- TCEQ 319 funding to develop a science-based, stakeholder driven Watershed Protection Plan

Coordinated Efforts

- SMWI/WPP
- COSM Water Quality Protection Plan/WQPP
- COSM MS4
- University MS4
- Habitat Conservation Plan/HCP
- City Planning & Land Development Code Rewrite
- University Planning

Project	2010	2011	2012	2013	2014	2015	2016	2017	Notes
San Marcos Observing System									Meadows Center for Water and the Environment comprehensive study
Spring Lake Underwater Archaeology									Meadows Center for Water and the Environment Underwater Archaeology in Spring Lake
Spring Lake Watershed Characterization									Meadows Center for Water and the Environment analysis of sediment inputs and stakeholder process
San Marcos Watershed Initiative									Meadows Center for Water and the Environment managed Watershed Protection Plan
Water Quality Protection Plan									Protect surface water and groundwater, because both provide habitat for aquatic endangered species
Comprehensive Plan									Revised San Marcos comprehensive master plan.
Stormwater Master Plan									Texas state University.
Drainage Master Plan									City plan to address flooding and erosion.
Sessom Creek Study									Sediment removal options to determine the best procedure to remove sand and gravel bar
Texas Pollution Elimination Discharge System									MS4 Regulatory program to control discharges of pollutants into surface waters
Revisions to Construction Standards									Texas state University
Habitat Conservation Plan									Plan to protect threatened and endangered species associated with the Edwards Aquifer
Texas State Master Plan									Texas State University-San Marcos to review and update of the 2006-2015 Campus Master Plan

Upper San Marcos Watershed Plan Components

- Structural BMPs for new developments and retrofits for existing development
- Demonstration projects to encourage adoption of water quality protection practices
- Education and Outreach Strategies
- Non-Structural Management Measures including land management strategies and preservation of undeveloped land
- Information gathering and monitoring to address remaining data gaps

Non-Structural BMPs

Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer

- Implement over recharge zone
- Expansion to contributing zone and all City and ETJ boundaries
- Expansion of stream buffer requirements over the Edwards Aquifer Recharge Zone – SM river corridor, focusing on east side corridor/future development (ETJ)
- Changing current river corridor ordinances enhanced rules to mirror Enhanced Rules (increase width, etc)



Lessons Learned

1. This process takes time, but needs to move faster
2. The science is critical
3. Monitoring and metrics are so important
4. None of this works without stakeholders and community involvement
5. Partnerships are key
6. Regional approaches are increasingly necessary

Lessons Learned

This process takes time, but needs to move faster...

No matter how great the talent or efforts, some thing just take time – Warren Buffett

You cannot run faster than a bullet, but you should try - Unknown

Lessons Learned

The science is critical... and monitoring and metrics are so important

If we knew what it was we were doing, it would not be called research, would it? – Albert Einstein

That which can be asserted without evidence, can be dismissed without evidence – Christopher Hitchens

Lessons Learned

None of this works without stakeholders and community involvement...

The good we secure for ourselves is precarious and uncertain until it is secured for all of us and incorporated into our common life – Jane Addams

Strength lies in differences, not in similarities –
Stephen Covey

Lessons Learned

Partnerships are key...

The organizational architecture is really that a centipede walks on hundred legs and one or two don't count. So if I lose one or two legs, the process will go on, the organization will go on, the growth will go on - Mukesh Ambani

You've got to have skin in the game - Unknown

Lessons Learned and Moving Forward

Regional approaches are increasingly necessary...

If everyone helps to hold up the sky, then one person does not become tired – Askkari Johnson Hodari

- Water does not follow jurisdictional boundaries
- Why reinvent the wheel?



You have the power to influence change



What can you do?

Citizens, Community Members

- **Participate in the process** – attend public meetings, be a stakeholder, join an organization
- **Get educated** – learn how to reduce your environmental impact and increase your community impact
- **Spread the word** – share what you know with your community
- **Speak the word** – let your elected officials and government representatives know what is important to you
- **Get outside** – take up space, volunteer, interact with your community

What can you do?

Municipalities, NGOs

- **Invite, encourage participation** - broad and diverse stakeholders
- **Educate and empower** – educate yourself and your staff, then provide resources, information, outlets
- **Spread the word** – share what you know with your community
- **Hear and Speak the word** – listen to your constituents, put some “skin in the game”
- **Get outside** – get out in the community, get to know the resources
- **Learn from others** – utilize existing resources

Texas A&M AgriLife Extension Service in Comal Co.

<http://comal.agrilife.org>

Water IQ

<http://wateriq.org>

Volunteer at Texas State Parks

<http://tpwd.texas.gov/state-parks/help-parks>

Volunteer at CONB Parks

<http://www.nbtexas.org/1487/Volunteer-Opportunities>

Water footprint calculator

<http://waterfootprint.org/en>

Reduce pollution

<https://www.nrdc.org/stories/6-ways-you-can-help-keep-our-water-clean>

<http://eschooltoday.com/pollution/water-pollution/prevention-of-water-pollution.html>

Receive a Rain Garden in your neighborhood!

If you can answer yes to these questions your neighborhood could qualify to receive a rain garden:

- ✓ Do you live in a Neighborhood over the Edwards Aquifer Recharge Zone?
- ✓ Is there community property in your neighborhood where a garden could be installed?
- ✓ Can you organize a group of 4 or more persons to work on the rain garden?

The Greater Edwards Aquifer Alliance (GEAA) is searching for neighborhoods over the recharge zone that have residents interested in creating a rain garden. GEAA has experts to work with your community to design a multifunctional rain garden and the funds to build it. The benefits from this rain garden include:

- Reduce water pollution
- Reduce flooding
- Increase our water resources
- Cool the air
- Save money
- Beautify neighborhoods



TEXAS STREAM TEAM



- Paddlers
- Anglers
- Divers
- TST on Campus
- Monofilament Finders
- Biomonitoring
- Riparian Assessments



Volunteers collect water quality data from established sites

- Temperature, pH, dissolved oxygen, conductivity, water clarity, field observations
- Advanced training for E. coli, nitrates, phosphates, turbidity

THANK YOU

Explore Spring Lake | Join Us | Partner Up | Sponsor a Project | Put Us to Work

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