THE MEADOWS CENTER FOR WATER AND THE ENVIRONMENT

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

RESEARCH | STEWARDSHIP | SERVICE | EDUCATION

The Meadows Center
for Water and the Environment
Texas State University

Billion-Dollar Weather and Climate Disasters: Mapping

- Overview
- Mapping
- Time Series
- Summary Stats
- Table of Events

To better visualize the spatial dimensions of Billion-dollar weather and climate events, below is an interactive event frequency mapping tool. This interface provides a customizable range of years and disaster types, to help visualize how disaster costs change over space and time. A dynamic summary of the Billion-dollar disaster events is also refreshed as the map selection is updated.

CPI-Adjusted | Unadjusted

« 2016 | 1980 »

Update

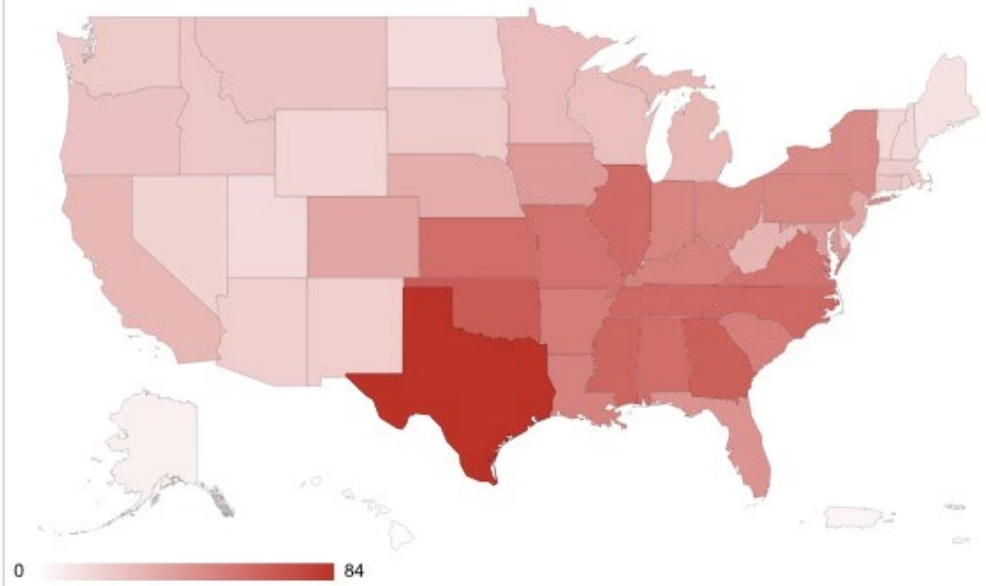
- [x] Drought
- [x] Flooding
- [x] Freeze
- [x] Severe Storm
- [x] Tropical Cyclone
- [x] Wildfire
- [x] Winter Storm
- [ ] All Disasters

Begin Year: 1980

End Year: 2016

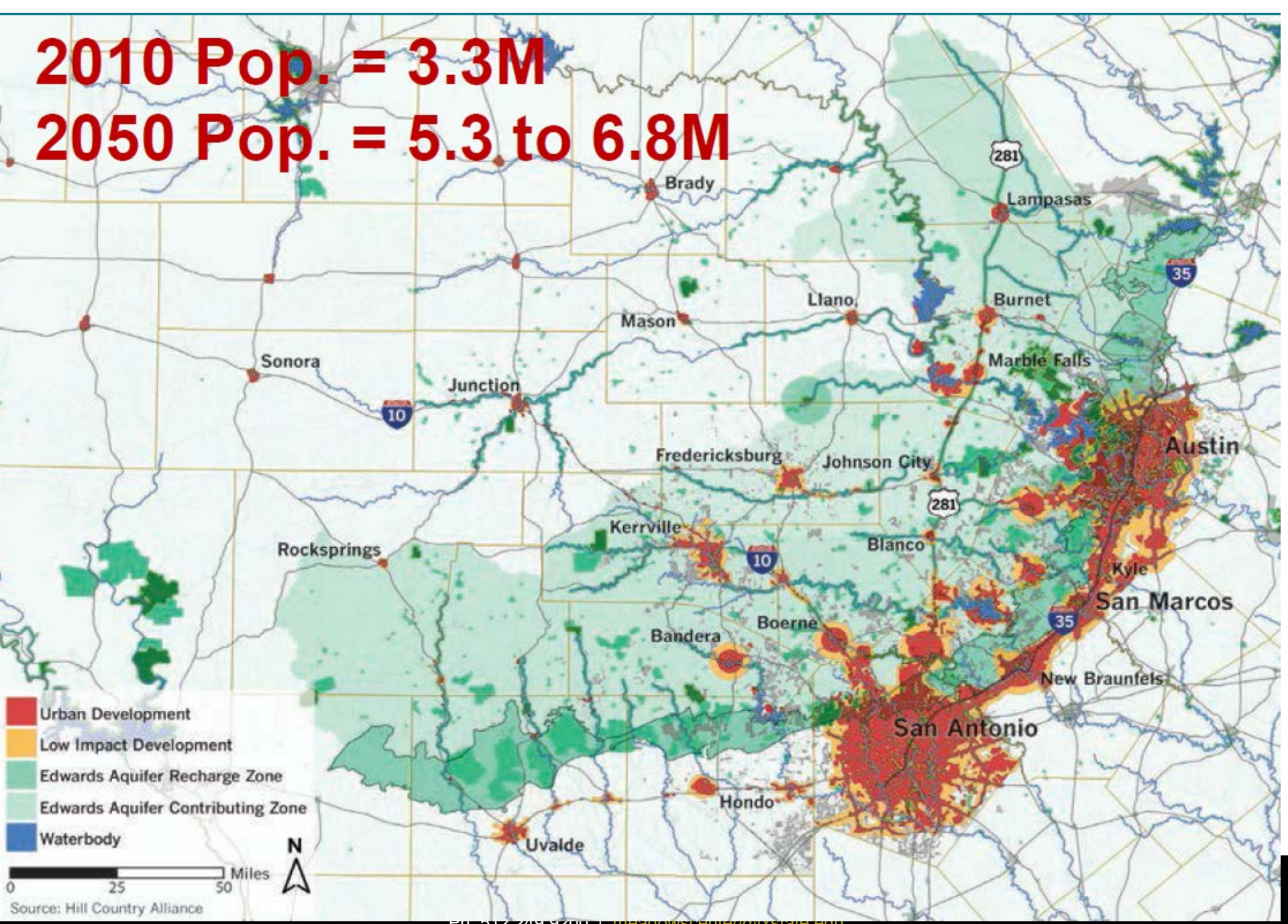
From 1980–2016, there were 24 drought events, 26 flooding events, 7 freeze events, 83 severe storm events, 35 tropical cyclone events, 14 wildfire events, and 14 winter storm events with losses exceeding $1 billion (CPI-Adjusted) each across the United States.

1980-2016 Billion-Dollar Weather and Climate Disasters By State (CPI-Adjusted)



Please note that the map reflects a summation of billion-dollar events for each state affected (i.e., it does not mean that each state shown suffered at least $1 billion in losses for each event).

Save/Print


2010 Pop. = 3.3M
2050 Pop. = 5.3 to 6.8M
Brady
Lampasas
281
35
Llano
Burnet
Mason
Marble Falls
Sonora
Junction
10
Fredericksburg
Johnson City
Austin
281
Kerrville
Blanco
Rocksprings
10
Kyle
San Marcos
35
Boerne
Bandera
New Braunfels
San Antonio
Hondo
Uvalde
Urban Development
Low Impact Development
Edwards Aquifer Recharge Zone
Edwards Aquifer Contributing Zone
Waterbody
N
Miles
0
25
50
Source: Hill Country Alliance

CYPRESS CREEK

Let's keep it clean, clear & flowing

Celebrating 10 Years

Of stakeholder-driven watershed protection in the Cypress Creek Watershed

The Meadows Center for Water and the Environment
Texas State University

EPA United States Environmental Protection Agency

The Meadows Center for Water and the Environment
Texas State University
Texas Stream Team

Texas Commission on Environmental Quality

Texas State University
The rising STAR of Texas

City of Wimberley

Wimberley Valley Watershed Association

GBRA
Guadalupe-Blanco River Authority

The City of Woodcreek
In the Midst of the Texas Hill Country

Hays Trinity Groundwater Conservation District

The Texas Clean Rivers Program

Hays County State of Texas

Texas State Soil and Water
Soil
Water

Texas Water Development Board

Texas A&M AgriLife Extension

Lions International

The Nature Conservancy

The Meadows Center for Water and the Environment
201 San Marcos Springs Drive | San Marcos, TX. 78666
Ph. 512.249.9200 | meadowscenter@txstate.edu

Cypress Creek Watershed Protection

- Activities to prevent pollution, protect flow
- Preserve water quality through local permitting, ordinances
- Improve tools for decision makers to calculate effects of land use changes on water quality
- Site-specific LID/Green Infrastructure demonstration sites
- Outreach and education efforts
- Monitoring and modeling water quality changes

Simply Stated:

The Cypress Creek Watershed Protection Plan aims to ensure that the long-term integrity and sustainability of the Cypress Creek watershed is preserved and that water quality standards are maintained for present and future generations.

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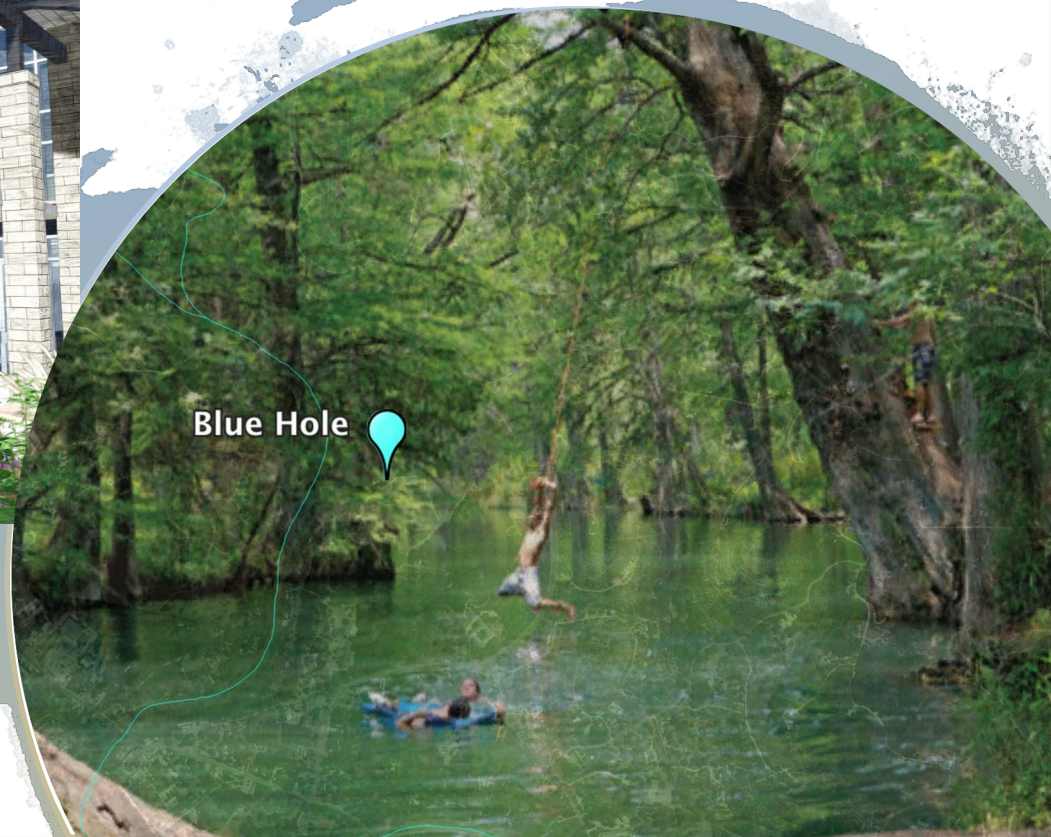
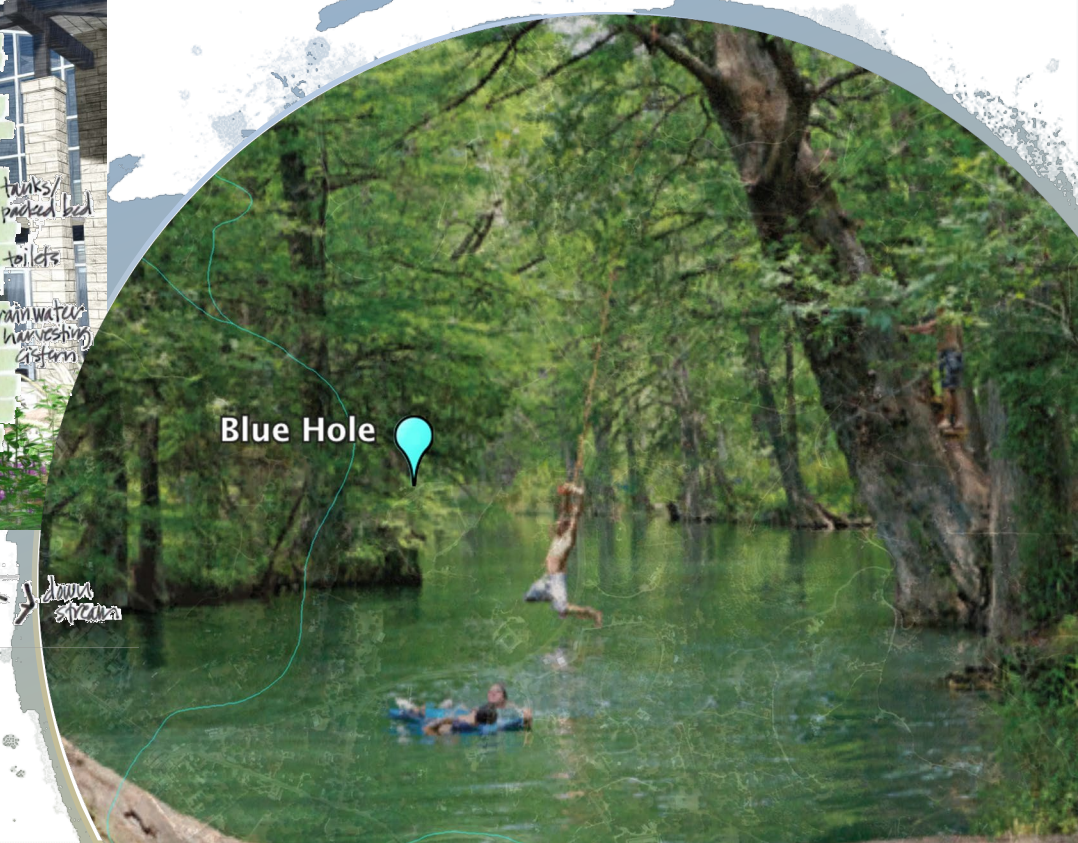
A New Primary School for Wimberley ISD



WISD Primary School Environmental Concerns

- Conversion of native range to developed site
- Contractors selected and design process already underway
- Standard construction w/ minimal water conservation practices + wastewater to be transported to off-site, traditional WWTP
- Water supply from already stressed Cow Creek aquifer… the source of flow for Jacob's Well Spring
- Stormwater impacts to ephemeral tributary and Cypress Creek with no enhanced GSI
- A MISSED OPPORTUNITY

A One Water School for Wimberley ISD



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DOUCET & ASSOCIATES

The *One Water* Standard:

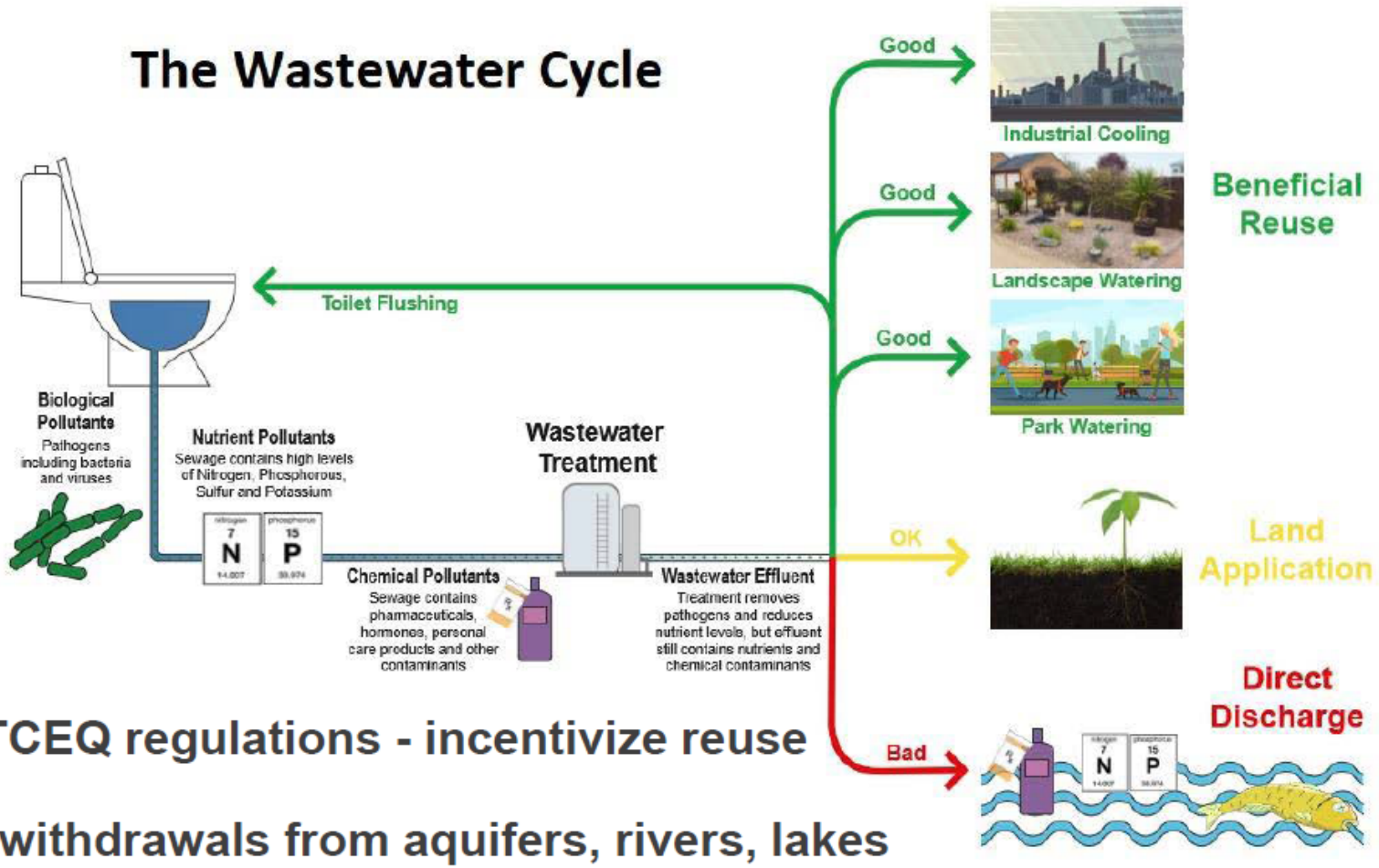
- *Collaboration*… with a wide variety of stakeholders and engagement with the community
- *Economics and finance*… that recognize the true cost of water, prices it accordingly, and are attractive for public and private investors
- *Green Infrastructure*… that works with and mimics nature
- *Closed-loop system*… that enhance nutrient and energy recovery and encourage water sensitive behaviors
- *Built Environment*… with multifunctional infrastructure that supplements the natural environment
- *Enabling conditions*… that foster innovative institutional and management arrangements
- *Flexible and adaptive*… to allow for innovation and strengthen

One Water standards as presented by Howe, C. and Mukhebeir, P., "Pathways to One Water: A guide for Institutional Innovation." Water Environment & Reuse Foundation, 2015

WISD *One Water* **Challenges**

- Requires Education
  - Elected officials, general contractor, architects, ENGINEERS, watershed stakeholders, and US!
- Requires Courage
  - Technology is still innovative w/ few Texas examples
  - Permitting processes do not incentivize reuse… treat wastewater as a nuisance that needs to be "disposed"
- Requires Investment
- Dare to Lead!

Wastewater as a Water Supply

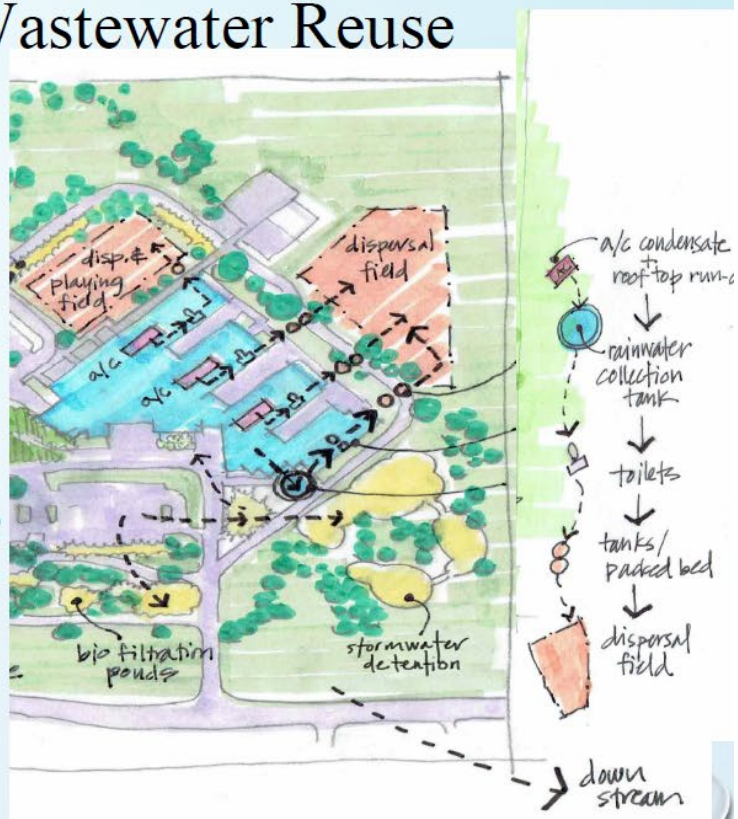


- Modify TCEQ regulations - incentivize reuse
- Reduce withdrawals from aquifers, rivers, lakes
- Preserve aquifers and streams natural character

D&A DOUCET & ASSOCIATES

Water Collection + Onsite Wastewater Reuse

- RECIRCULATING PACKED-BED FILTER SYSTEM
- FIRST COST SAVINGS - $300,000 *based on 7500/day system
- POTENTIAL SAVINGS VS CONVENTIONAL SYSTEM
  - OVER 30 YEARS ANNUALLY $20,000 - $30,000
- CASE STUDY – ORENCO SCHOOL – ADVANTEX
- PARALLEL PERMITTING APPROACH WITH HAYS & TCEQ



Stormwater Management

- Protect Water Quality & Conserve Water Quantity

Conventional vs One-Water Cost Summary

WATER SUBSYSTEM	COST TYPE	CONVENTIONAL	ONE-WATER
WASTE WATER + REUSE	CAPITAL COST	$ 750,000	$ 446,778
	ANNUAL O & M COST	$ 26,695	$ 6,000
RAINWATER + AC CONDENSATE COLLECTION FOR TOILET FLUSHING	CAPITAL	$ -	$ 250,000
	ANNUAL O & M COST	$ 19,488	$ 10,188
STORMWATER MANAGEMENT (LID & GREEN INFRASTRUCTURE)	CAPITAL COST	$ -	$ 125,000
	ANNUAL O & M COST	$ -	$ -
SUM TOTAL ALL WATER SYSTEMS	CAPITAL + 30 YEAR O & M COST	$ 2,135,490	$ 1,307,418

Benefits: Bringing It All Together

- FOR WISD:
  - Reduced capital and operating costs
  - Establish leadership in the community on a flagship site
- FOR THE COMMUNITY
  - A catalyst for creating a watershed culture
  - A Living Lab for integrated water management
- FOR THE CHILDREN
  - Healthier and smarter kids
  - Engaging and Inspirational Learning Experience

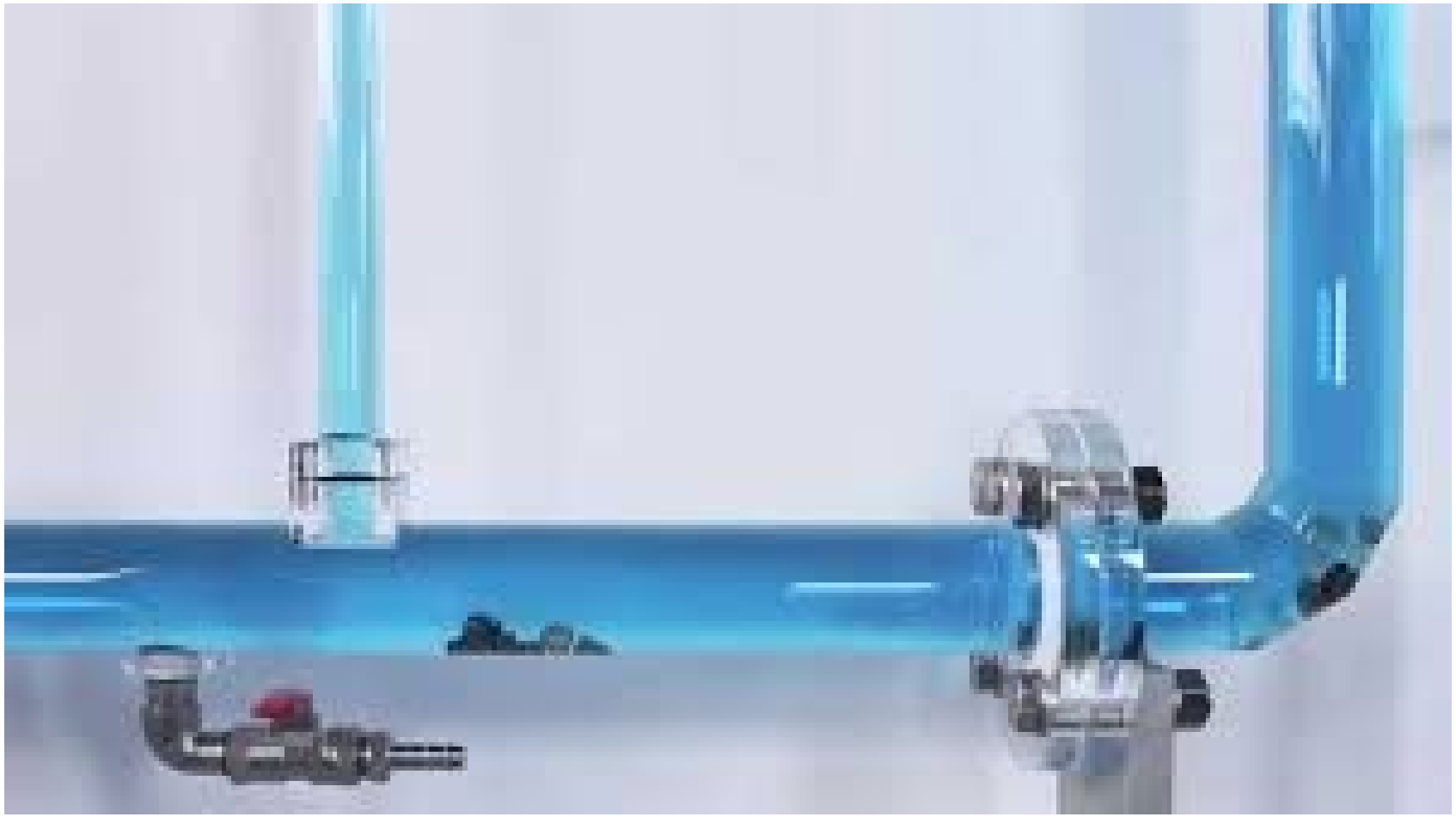
LOCAL

Wimberley school to make history as first ‘One Water’ school in Texas

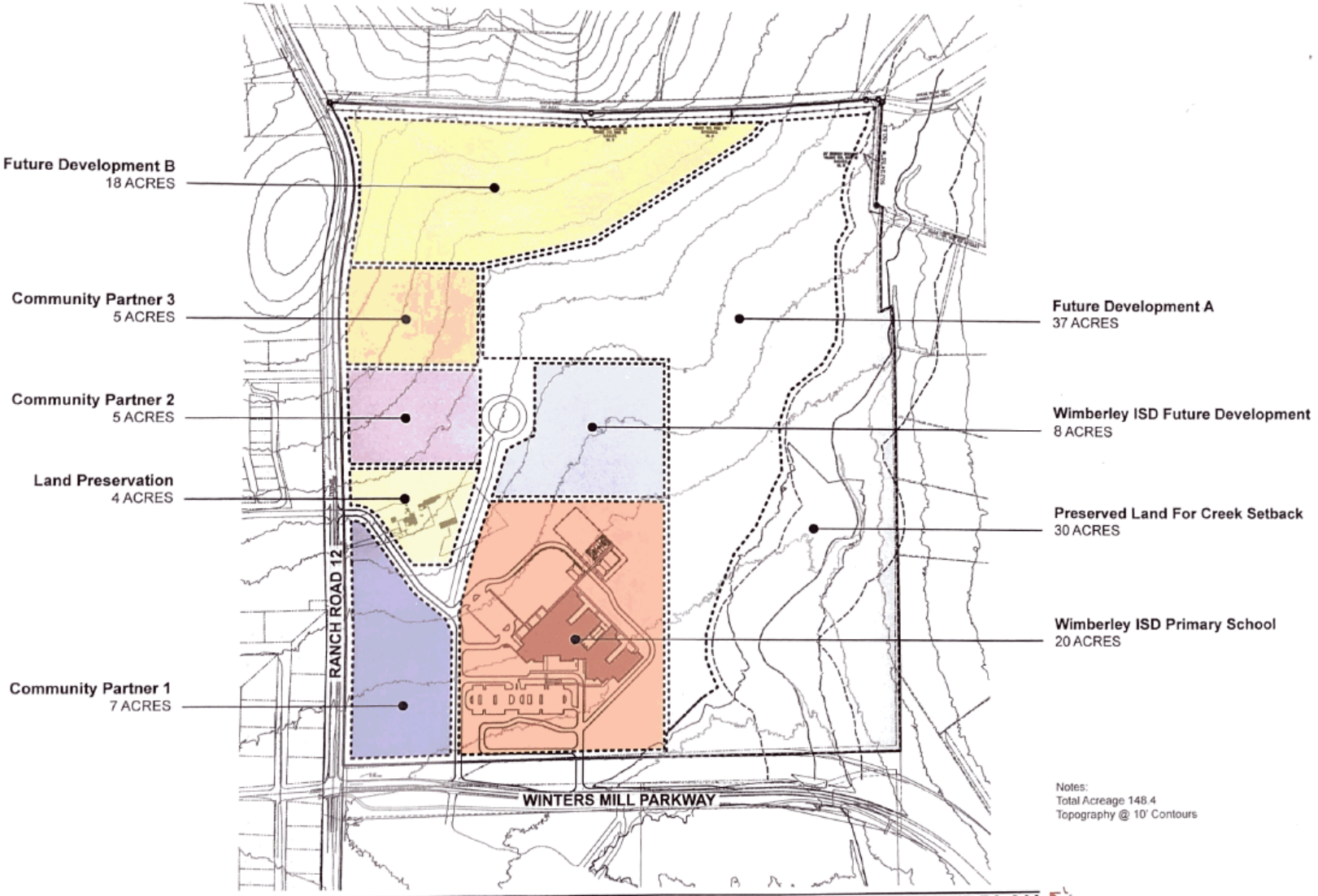
A 'One Water' school means it will use 90 percent less groundwater than a typical school of this size.

Author: Shawna Reding
Published: 8:04 AM CST December 3, 2018
Updated: 11:06 AM CST December 3, 2018

From Good to *One Water* Great



Next Step: A *One Water* Master Plan:



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