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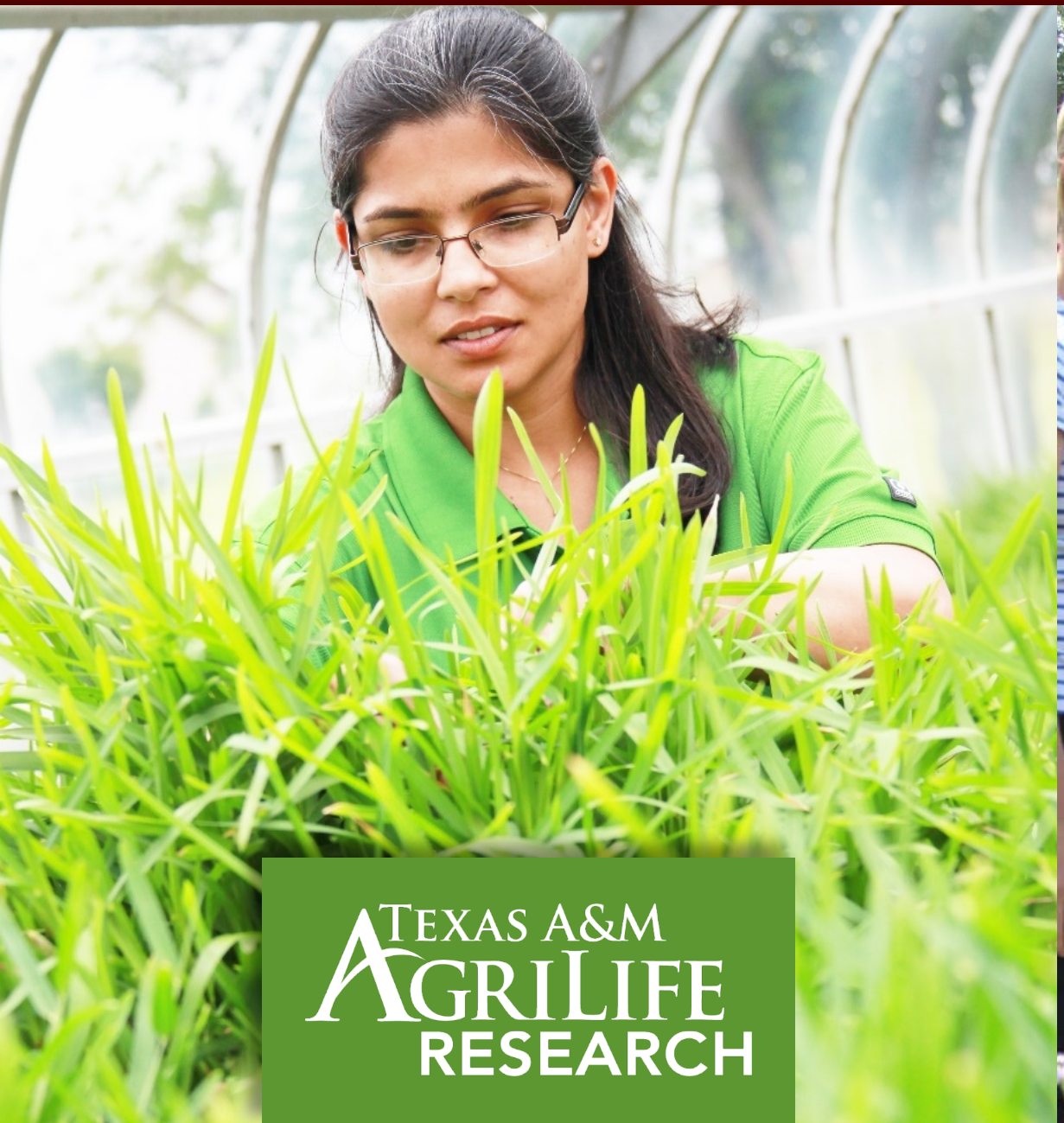
Landscape Trends:

Reducing Water While Growing Food For People and Pollinators

DANIEL CUNNINGHAM
@TXPlantGuy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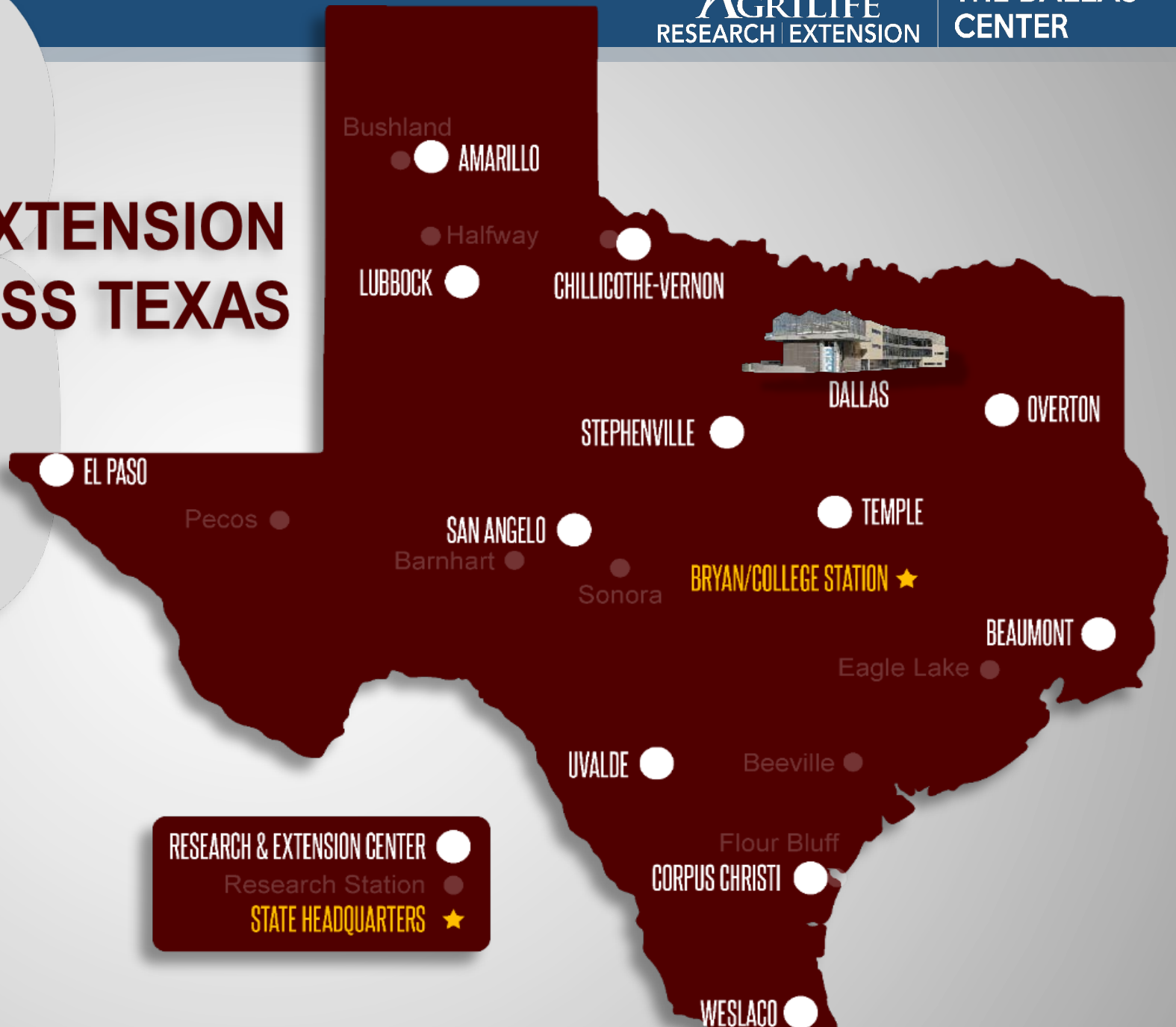
13 RESEARCH & EXTENSION CENTERS ACROSS TEXAS



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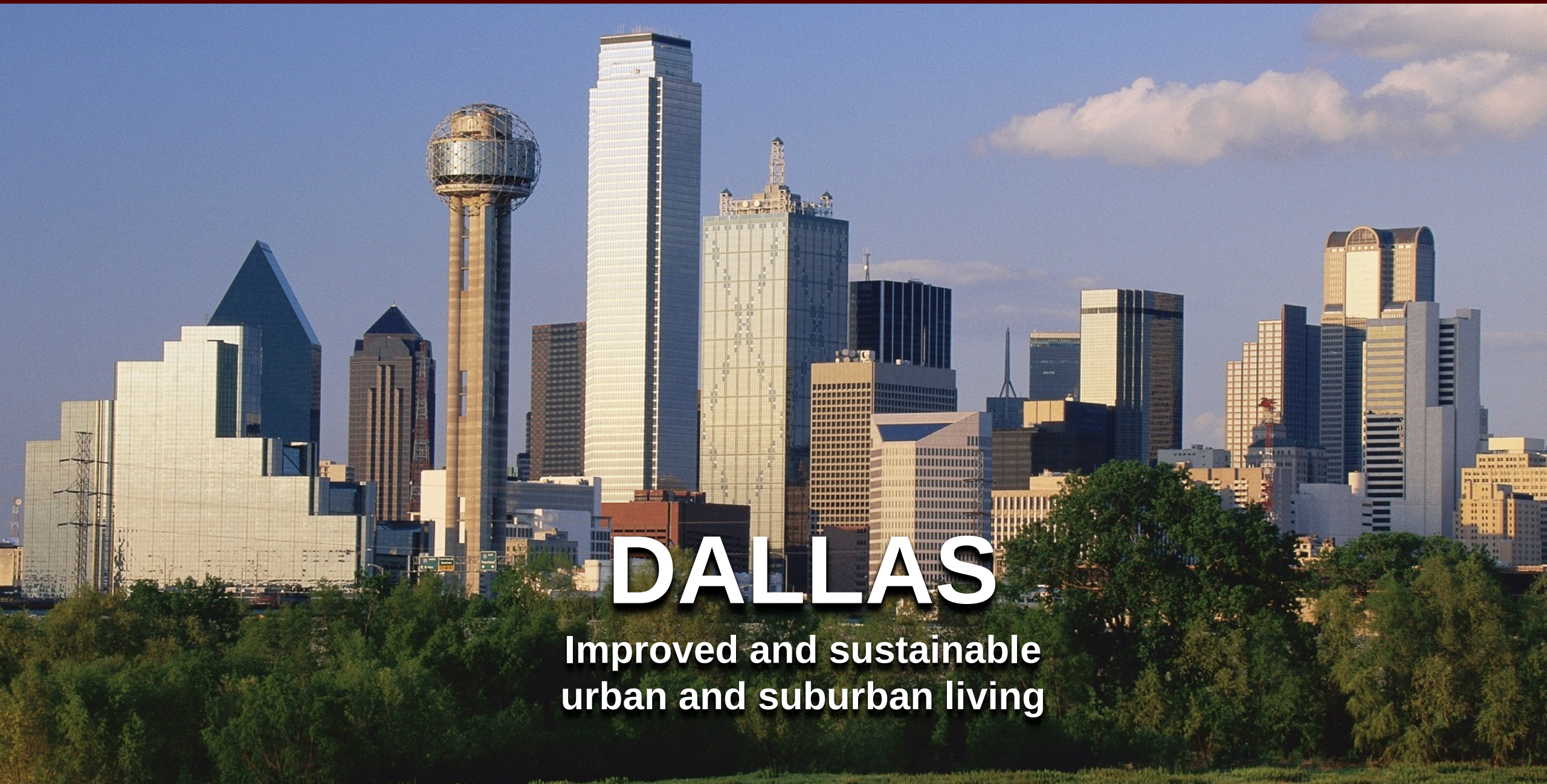

DALLAS

Improved and sustainable urban and suburban living


7.5 MILLION PEOPLE

Texas A&M AgriLife Research

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RESEARCH, PUBLIC OUTREACH AND CONTINUING EDUCATION

WATER USE EFFICIENCY

IN THE URBAN ENVIRONMENT


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MISSION
Shape perception
Change behavior

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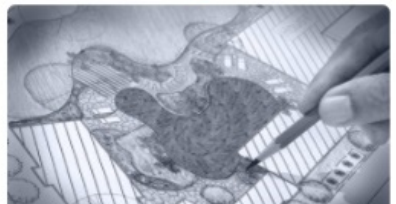
Courses

Plant Database

ULandscapeIt



Publications

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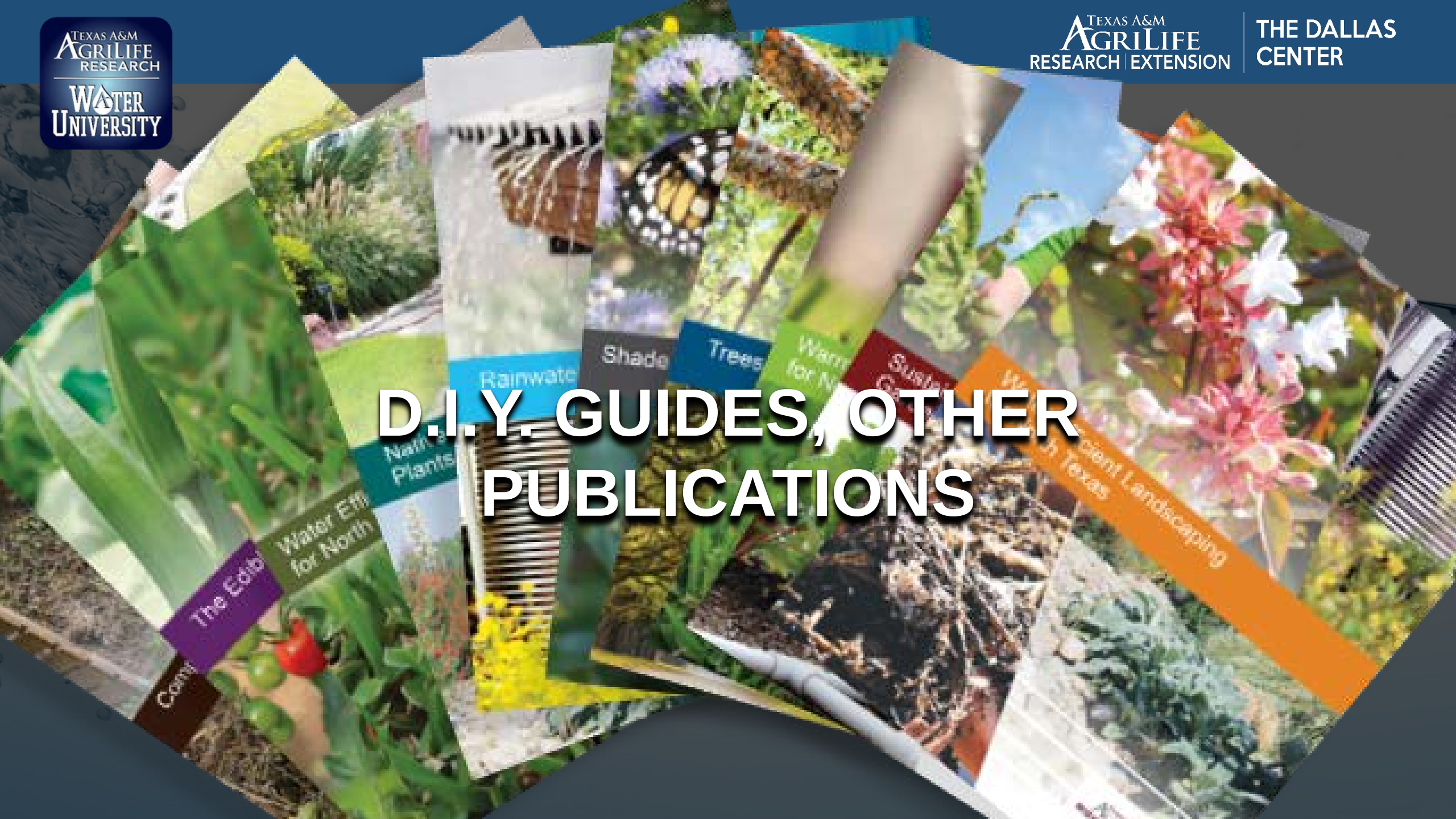
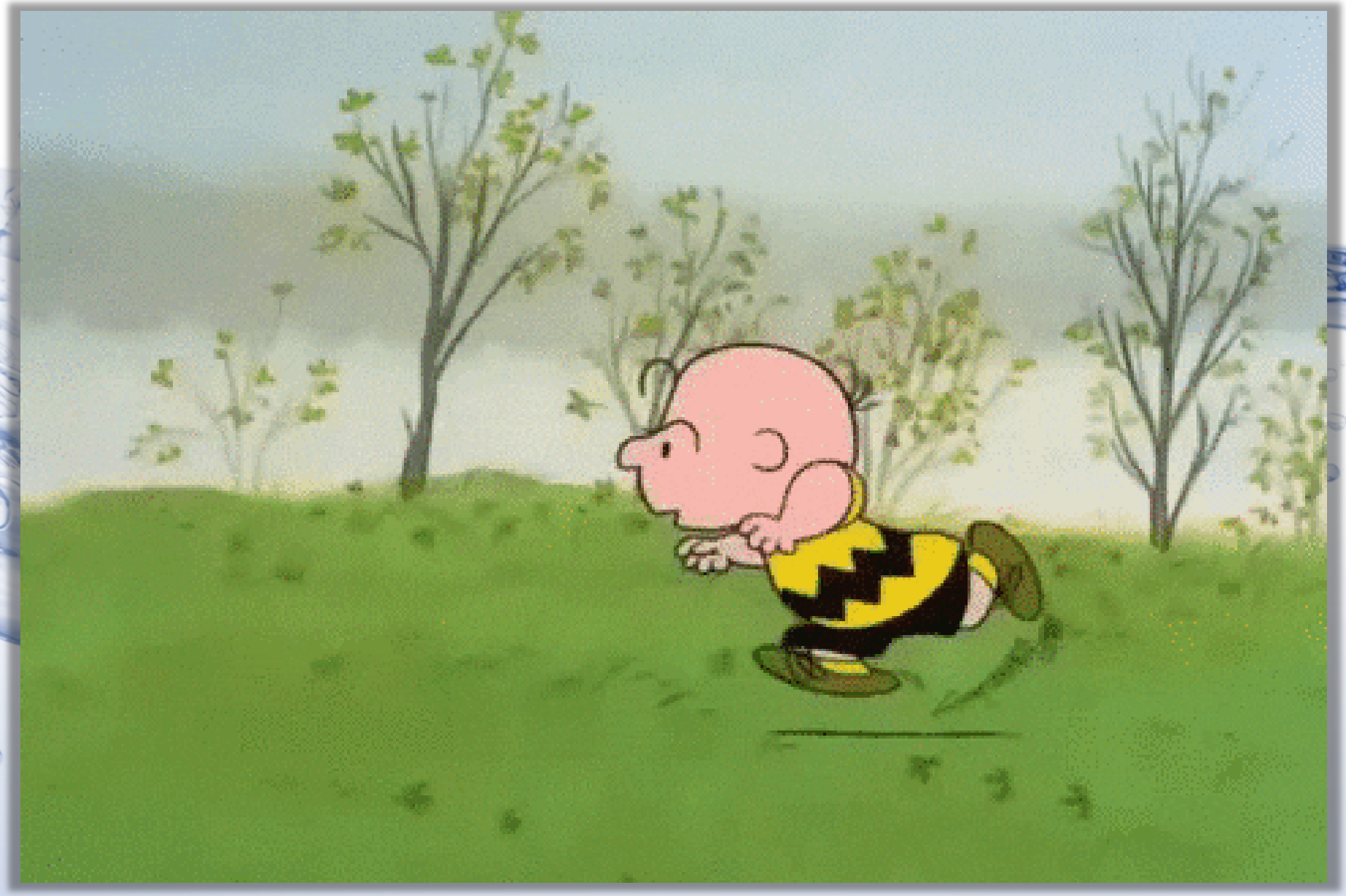


D.I.Y. GUIDES, OTHER PUBLICATIONS

LIVE PUBLIC COURSES

- 60 municipalities
- 4 major water utilities

The Bait and Switch



Outdoor Design Trends

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Clients are asking for:

2018

Outdoor living spaces that

- Are environmentally sustainable
- Reduce water costs
- Are lower maintenance

83% Native plants/Adapted Plants

74% Pervious Paving

72.4% Drip/ Efficient Irrigation

71.2% Rain Gardens

70.8% Reduced Lawn Area

70.6% Food/vegetable gardens

68.7% Rainwater/ Graywater Harvesting

65.9% Water-saving Xeriscape

American Society of Landscape Architects

35% in U.S. Are Growing Their Own Food

(42 million households)

- **Millennials-** 63% increase in edible gardening

Solution to:

- Social and environmental issues?
- Food waste?
- Food security?
- Food transport miles?
- **Wasted water?**
- Depletion of arable land?

Grow Your own Vegetables

Conservation

- Site Selection
- Soil Preparation
- Irrigation
- Plant Selection
- Mulch

Stormwater

- Composting
- Tillage/ Erosion
- Fertilization
- Pesticides

Grow Your Own Vegetables

"Lettuce" talk about vegetables! Whether you're trying to eat healthier, want to know where your food comes from, or just love the idea of growing delicious vine-ripened vegetables at home, this class is for you. Lean proper soil preparation, garden design and layouts, disease and insect identification, as well as the proper planting times for getting the most production out of your favorite vegetables in the challenging climate of North Texas. {All Seasons}

(1.5 - 2 hour class)

FoodScaping

Ornamental Value of Edible Plants

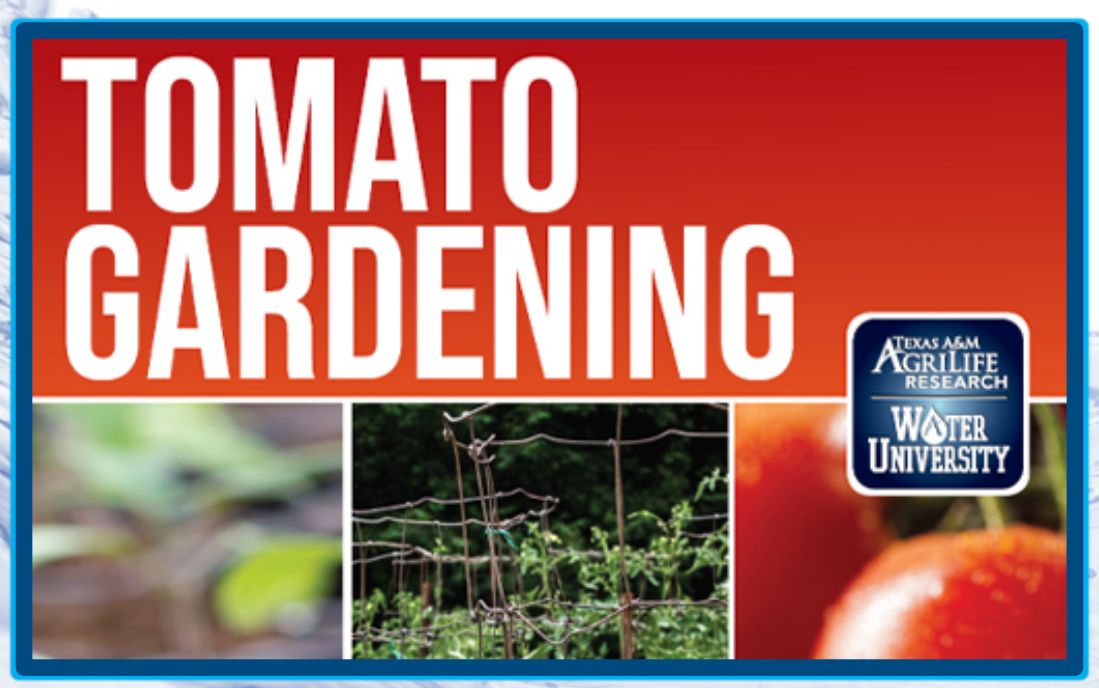
Efficient Irrigation
Plant Selection
Efficient Landscape Design

Soil Amendments
Fertilization
Pesticides

FoodScaping

Edible landscapes are one of the hottest trends in garden design! Utilizing areas in your landscape to grown edibles is a great way to add food to your table and reduce your grocery bill. This program teaches you how to incorporate edible plants into your home garden and landscape by taking advantage of their ornamental value. You will learn how herbs, fruits and vegetables can add to the colors and textures of your permanent landscape combining both aesthetics and functionality. {All Seasons} (1.5 - 2 hour class)

Let's Ketchup on Tomatoes



Conservation

- Site Selection
- Soil Preparation
- Irrigation
- Plant Selection
- Mulch

Let's Ketchup on Tomatoes

Have you always wanted to grow this delicious fruit?! The most sought-after garden treasure can be challenging to grow in the extreme climate and soils of North Texas. We'll go into depth, providing tips on how to get the most production out of your tomato plants covering everything from variety selection, proper planting, best irrigation practices to pest and disease control. No matter your gardening skills, this class will be sweet! {Spring/Summer/Fall}

(1 hour class)

Herb Your Enthusiasm: Herb Gardening

Conservation

- Site Selection
- Soil Preparation
- Irrigation
- Plant Selection
- Mulch

Herb Your Enthusiasm: Herb Gardening

Get the most out of your landscape or kitchen garden by choosing from the assortment of tasty and beautiful herbs adapted to Texas. We'll talk about everything from design and plant selection, proper soil prep and planting techniques, to the many uses of our favorite herbs inside and outside the home. This class is sure to be a great thyme! {All Seasons}

(1 hour class)

The Urban Orchard: Fruits, Nuts and Berries

Site Selection
Soil Preparation
Irrigation
Plant Selection

Composting
Mulch
Fertilization
Pesticides

The Urban Orchard: Fruits, Nuts and Berries

Whether you're trying to grow (or planning to grow) fruits, nuts and/or berries at home for their superior flavor, to save money or just want to know where your food comes from, this class is for you! This program teaches you how to become more water efficient in your "urban orchard", what plants and varieties work best in our area, the basics of pest control, proper pruning methods and other practical ways to increase production. Branch out and join us for a fruitful program! {All Seasons}
(1.5 - 2 hour class)

Outdoor Design Trends

Giving Back with Gardens

2018-19

Wildlife Friendly Landscapes

- Are environmentally sustainable
- Are lower maintenance
- Can reduce water costs

Attract pollinators

IPM/ Organic methods

Native Plants

Gardening for Wildlife

Conservation

- Plant Selection
- Mulch

Stormwater

- Fertilization
- Pesticides

On The Wild Side: Gardening to Attract Wildlife

An often overlooked asset of many regionally native and adapted plants is their ability to attract and provide food and habitat for wildlife – literally breathing life into your landscape! Many native birds, butterflies, bees, and other welcome animals actually depend on these plants for survival. There are a number of plants with various structures, textures, and colors to meet the needs of homeowners interested in manicured and naturalistic landscape designs alike. Regardless of your personal aesthetic or the types of wildlife you're interested to attract, there is a native and adapted plant pallet to suit your tastes while boosting water efficiency at home!

Benefits of Native & Adapted Plants

Native and better-adapted plants in home and business landscapes serve as environmentally sustainable assets that are usually labor efficient when compared with resource intensive varieties. Some of the characteristics leading more Texans to incorporate native and adapted varieties include:

- Drought tolerance
- Heat tolerance
- Water efficiency
- Typically low fertilizer requirements
- Typically low pesticide requirements

Before you begin: Pesticide and fertilizer awarness

ALWAYS apply fertilizers and pesticides adhering strictly to label instructions.

Practice **INTEGRATED** Pest Management (IPM) whose goal is to eliminate pest problems, **NOT** to eradicate pests. IPM helps to strengthen and stabilize the landscape by creating conditions that are more favorable for plants than for pests:

1. **IDENTIFY THE INSECT FIRST!** Is it a friend or foe?
2. If it is a pest, does the population warrant treatment? (high numbers, damage to plant)
3. Consider treatment options that are less toxic to you and the environment.
4. Make sure the treatment, organic or inorganic, will not adversely affect beneficial insects like bees, earthworms, and caterpillars.

Visit http://ipm.tamu.edu for IPM information.

What do you mean by Native & Adapted?

Native plants are hardy, having evolved in our (sometimes) harsh and unpredictable climate. They thrive on the soils that occur here and on the specific nutrients those soils provide. Native plants also tend to be more resistant to pest pressures of insects and diseases common to North Texas. A plant might be native to:

- Texas
- North Texas
- Your County
- Your City

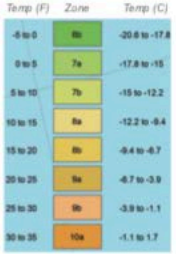
Adapted plants are also hardy but have been introduced to Texas landscapes through the horticulture industry. Most often, they originate from areas with similar soil types, climates and /or hardiness zones.

Plant Database

Visit wateruniversity.tamu.edu for a comprehensive and searchable database of plants that thrive in North Texas.

Texas Plant Hardiness Zones

Adapted from USDA national plant hardiness zone map



Average Annual Extreme Minimum Temperature 1976-2005

Remember, even thought a plant is native to Texas, it is important to make sure it is well adapted to our area. i.e. A plant native to Corpus Christi may not feel so at home in Dallas.

There are also many plants available that have native parents, but have been bred for improved ornamental characteristics.

North Texas Zone 8a

Avg. Low Temp. 10-15 °F
Record Low -8°F 1980
Record High 113°F 1980
Avg. First Freeze Nov. 22
Avg. Last Freeze March 13
Avg. Yearly Rainfall 40.55"
(Can range from 20"-50")

Common Soils
Poor draining clays & lay loams, mostly alkaline, pH 7.5 to 7.8
Sandy loams and sandy soils can also be present.

Butterfly Gardening Classes

Butterfly Gardening

Butterflies are welcomed visitors that bring the landscape alive with activity and help to pollinate our favorite plants. Learn tips to create butterfly habitat in your landscape by introducing a water source and feeders, as well as how to select the right plants as host species for caterpillars. We'll also talk about our favorite native and adapted flowers that provide long lasting blooms as nectar sources to help your garden take flight! {Spring/Summer/Fall}

(1 hour class)

Wildlife Poster

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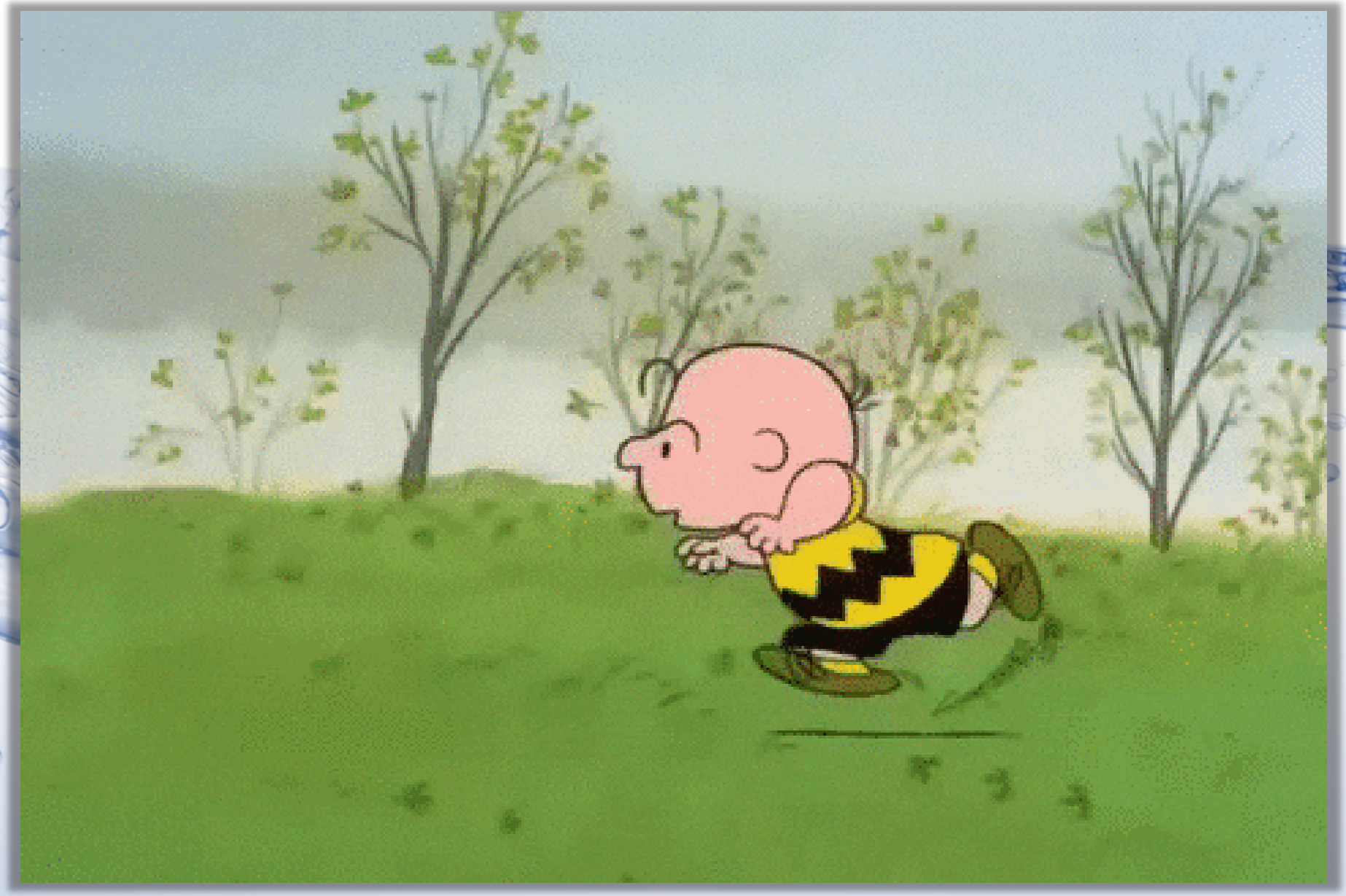
The Bait and Switch



The State Of Water

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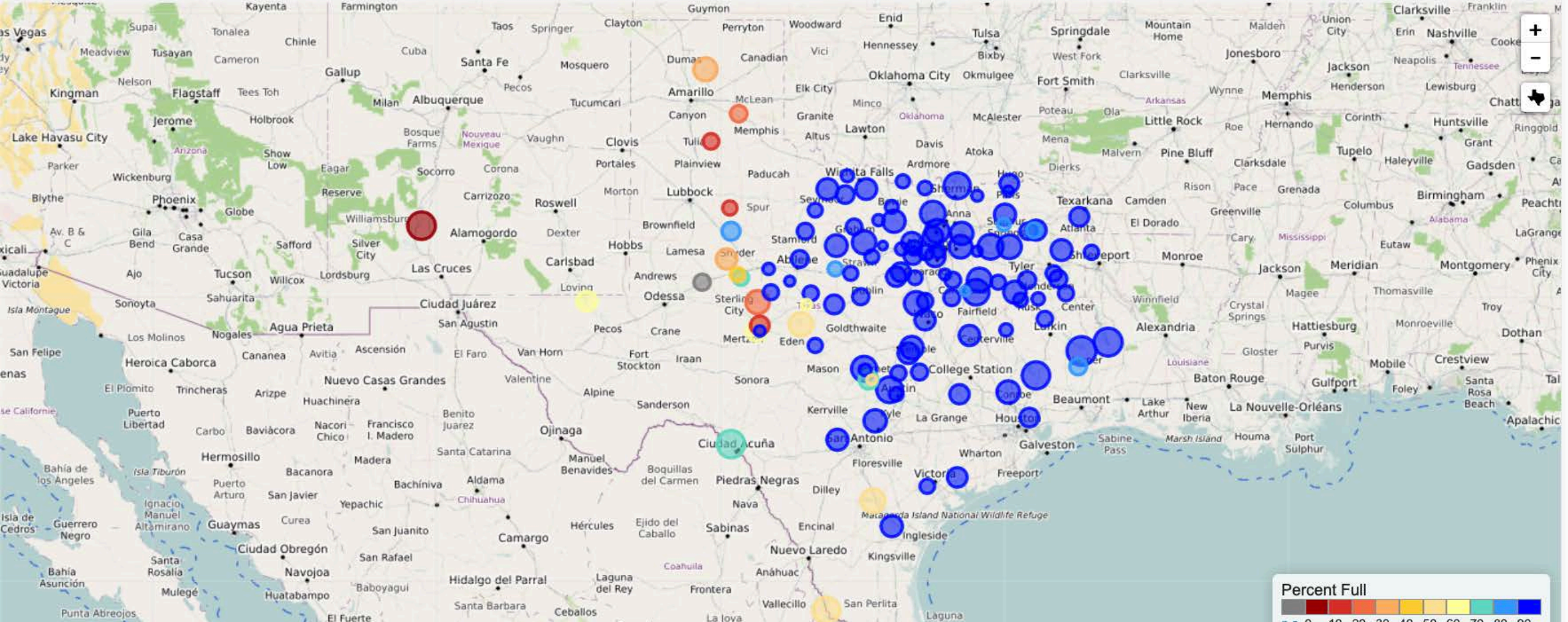
Wate | Reservoirs | Drought | Groundwater | Coastal | TexMesonet | About | Texas Water Development Board

Sta... | ...ning Area | By River Basin | By Municipal Area | By Climate Region | ☆ Flooding | About

Texas Reservoirs: Monitored Water Supply Reservoirs are 89.7% full on 2019-02-06



Population of Texas

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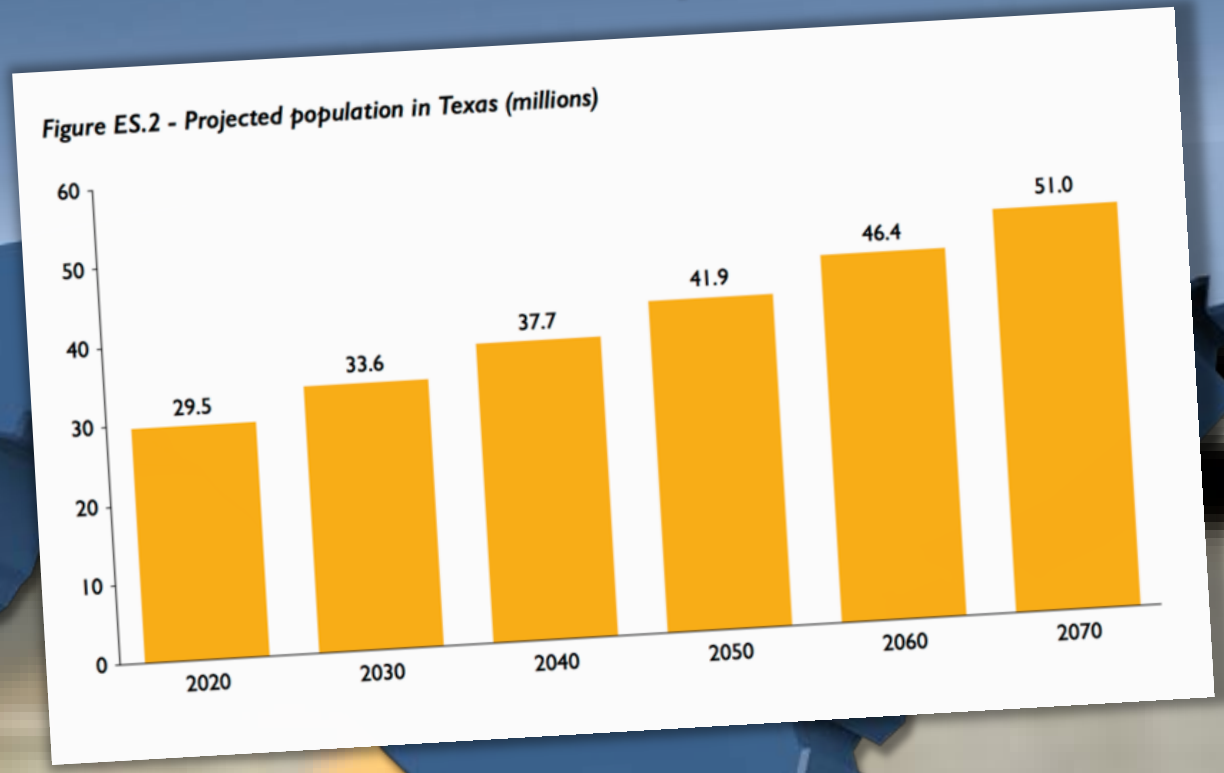
Increase 70% by 2070

(29.5 million to 51 million)

*TWDB Projections



Texas' existing water supplies

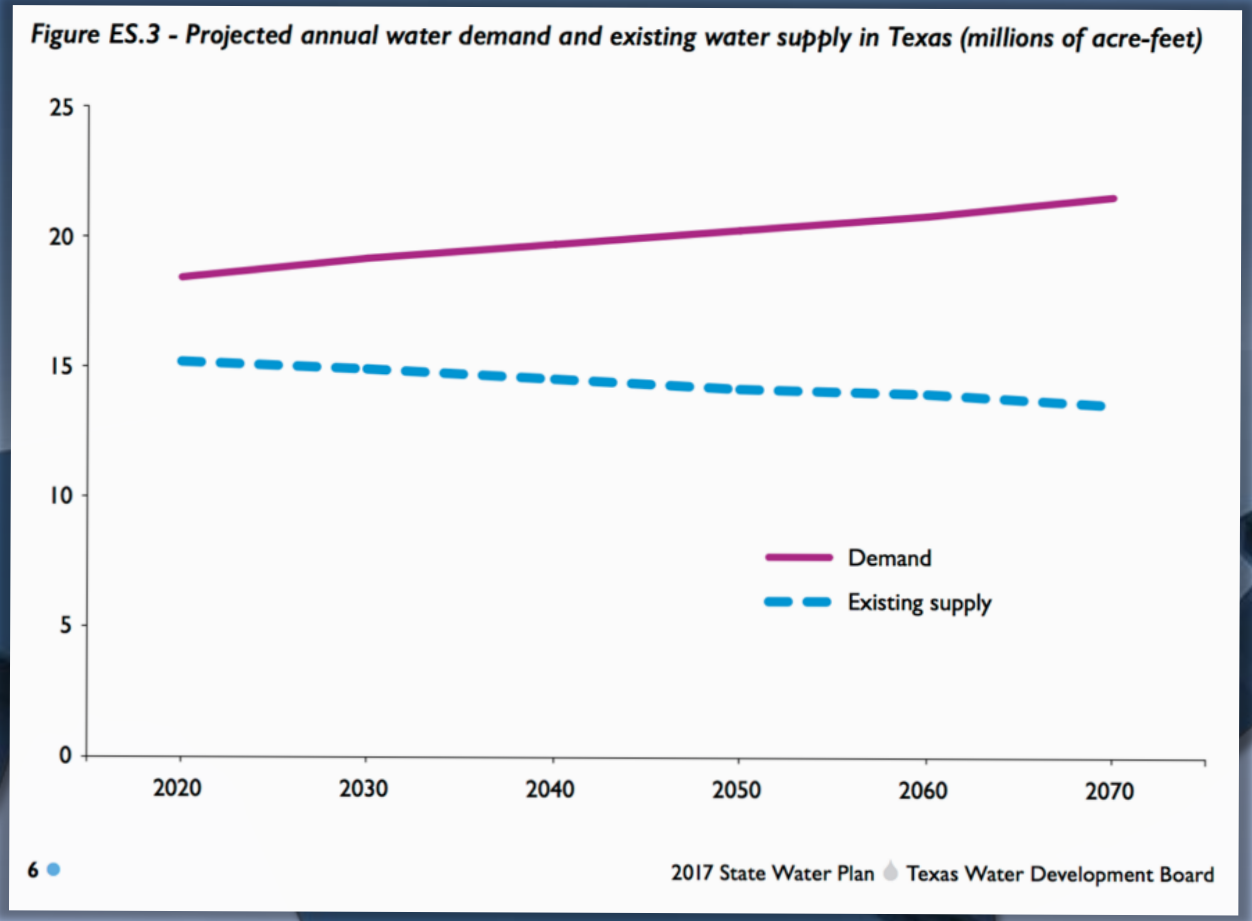
(that can be relied on in the event of drought)

Expected decline by approximately 11% (2020 -2070)

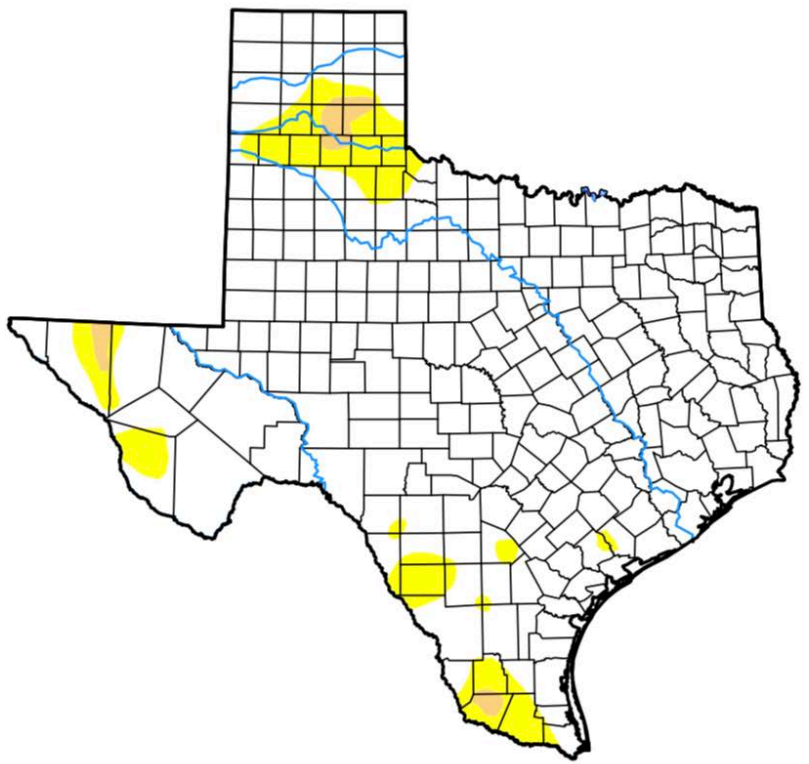
15.2 million to 13.6 million acre-feet

Population of Texas

Water supply expected to decrease (from 15.2 million acre feet to 13.6)



Drought In Texas



U.S. Drought Monitor

Texas

January 29, 2019

(Released Thursday, Jan. 31, 2019)

Valid 7 a.m. EST

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

Brian Fuchs
National Drought Mitigation Center

http://droughtmonitor.unl.edu/

Potential water shortage?

4.8 million acre-feet per year in 2020
8.9 million acre-feet per year in 2070

*(in **drought of record** conditions)*

Texas 2017 State Water Plan

Conservation & Reuse strategies –

Increased from 34% to 45 % of total future water volume!

Outdoor Use

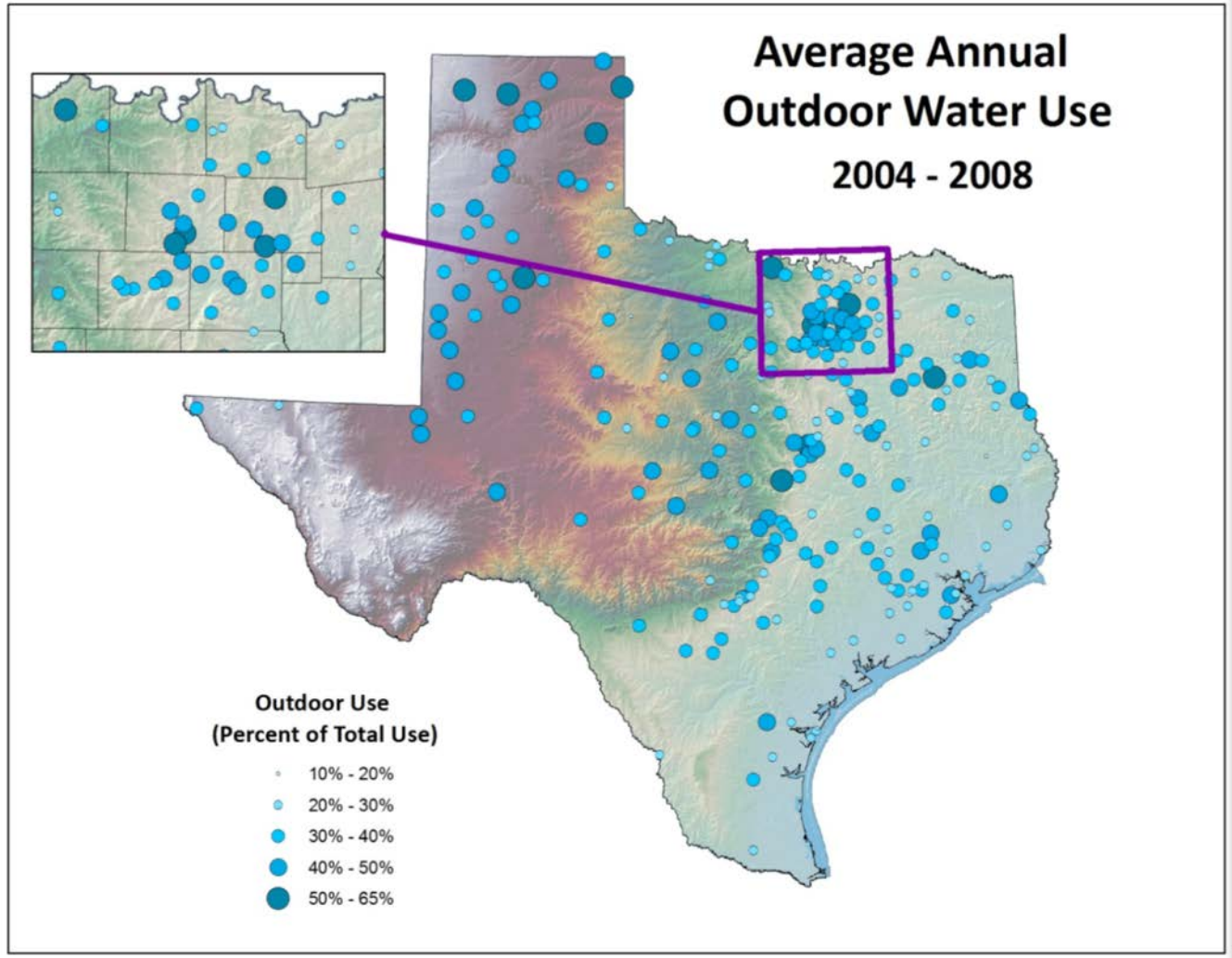
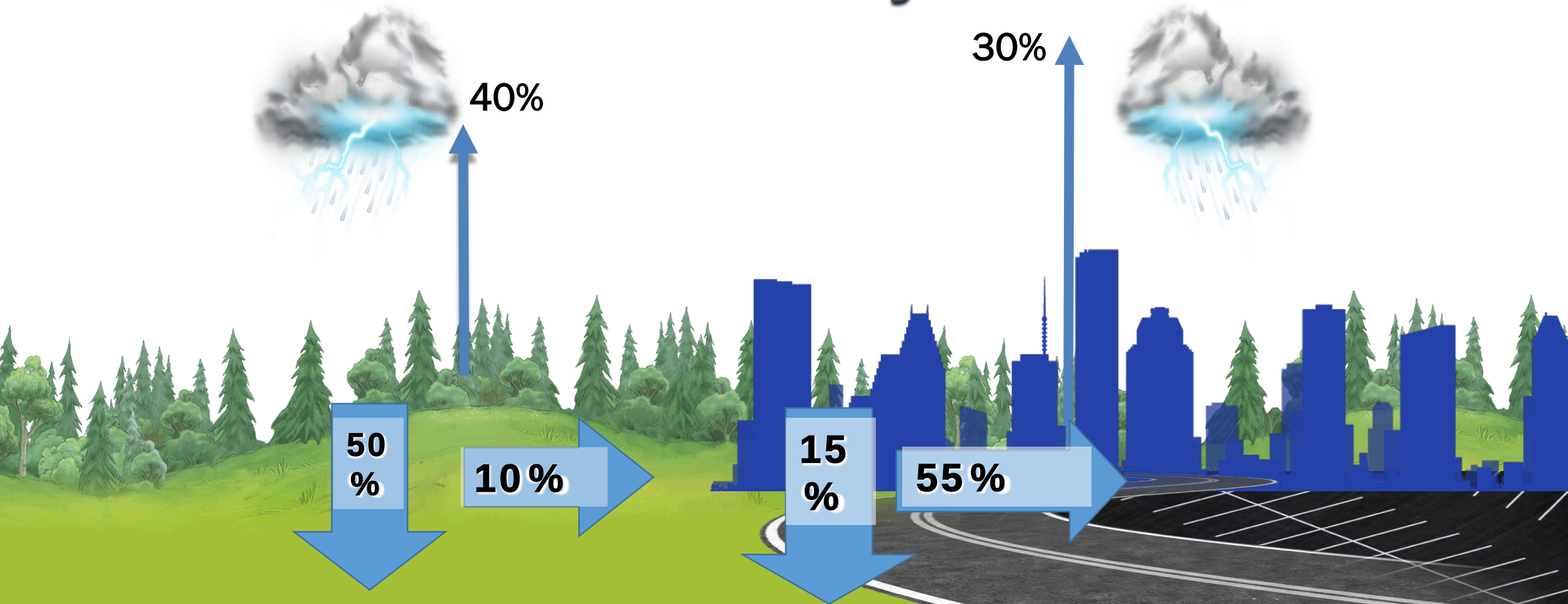


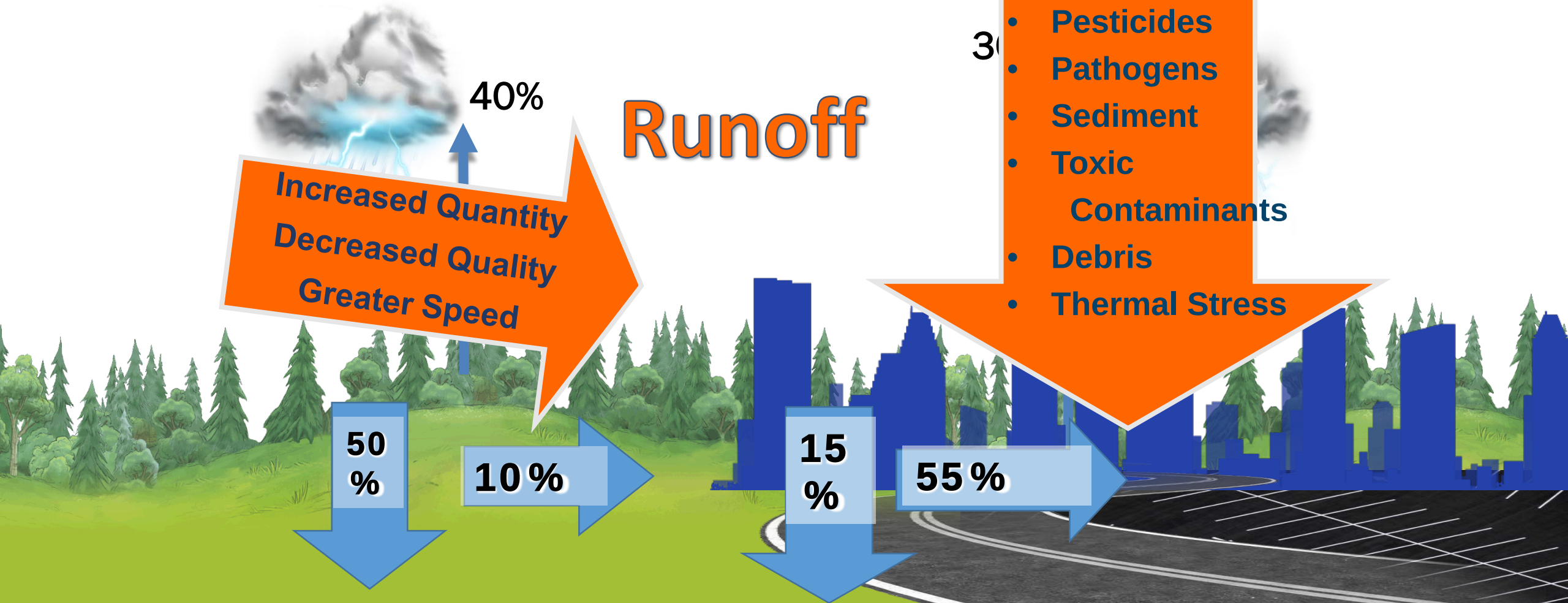
Table 3: Annual average water use by city for 2004 through 2011.

	City	Indoor use (gallons)	Outdoor use (gallons)	Outdoor use as a percentage of total use	Gallons per household per day for indoor use (gallons)	Gallons per household per day for outdoor use (gallons)
1	Amarillo	4,203,333,000	3,110,188,125	42	194	143
2	Arlington	6,579,447,000	3,806,411,375	36	198	114
3	Austin	11,532,894,150	5,879,032,288	33	176	89
4	College Station*	1,510,618,286	922,872,143	38	-	-
5	Corpus Christi	4,983,501,000	1,839,473,375	26	179	66
6	Dallas	16,293,358,200	11,668,235,723	41	173	125
7	El Paso	12,676,702,014	6,231,936,280	33	220	105
8	Fort Worth	11,576,921,511	6,819,864,226	37	166	97
9	Garland	4,398,659,640	2,234,119,198	33	198	100
10	Houston	22,287,783,000	5,629,024,250	20	148	37
11	Katy	281,554,500	202,737,375	40	188	135
12	Laredo	5,013,600,000	1,707,862,500	25	265	93
13	Lubbock	4,332,784,500	2,341,568,000	36	177	96
14	Odessa	2,327,562,000	1,358,331,500	37	205	119
15	Pflugerville	558,544,200	393,038,375	39	219	152
16	San Antonio**	23,242,411,406	7,713,879,696	25	202	67
17	Tyler	1,682,887,500	1,937,568,750	53	171	195
	City average			*35*	*192*	*108*
	City median			*36*	*191*	*102*
	Statewide average			*31*	*181*	*86*

Development Impacts the Water Cycle



Development Impacts the Water Cycle



Protecting Our Surface Water

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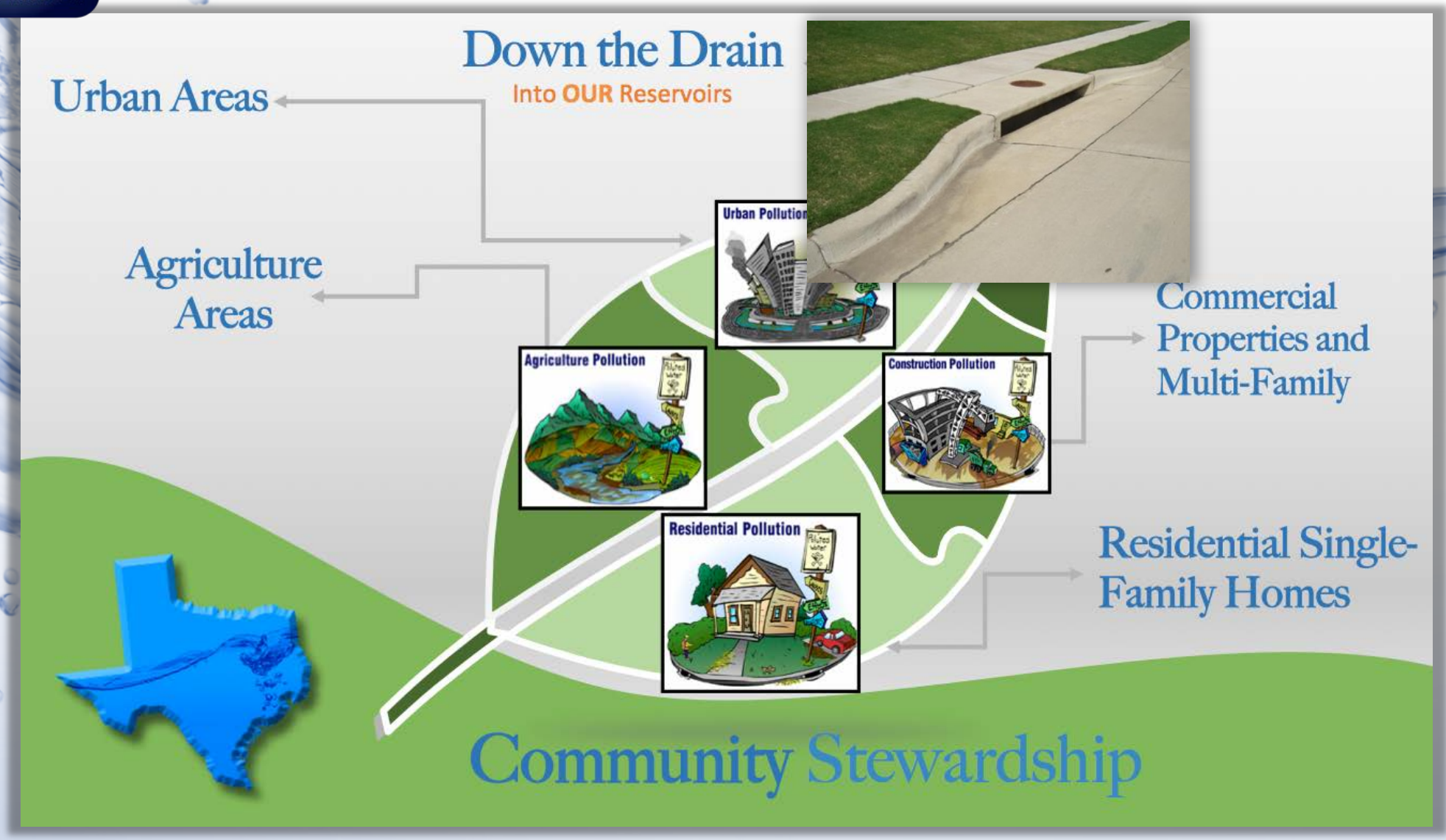

Landscape CPR

Conservation-

Saving resources **Water, Soil, Energy, Air Quality**

- Preserving and **enhancing habitat** and **ecological functions**

Permeability-

Disconnecting impermeable surfaces

- Breaking up hard surfaces **allow water to spread** out & sink in the ground
- **Creating soil** that is biologically active & **holds on to water**

Retention-

Holding water on the property for the benefit of **Soil, Plants, and Habitat**

- Grading to **capture water** and **allow it to sink** throughout the landscape
- **Eliminating of Runoff**

Lawns

Commonly over watered

- Creates the stigma “water hogs”

Overuse can lead to Water Pollution

- Fertilizers
- Pesticides,
- Other chemicals

(If managed the wrong way)

Reduce Turf Areas?

Benefits of Native & Adapted

Drought Tolerance
Heat Tolerance
Less Water
Less Fertilizer
Less Pesticides

*Native=Hardy & from Texas

*Adapted=Hardy & introduced to landscapes

Creating Advocates

2019 attendance *2174

36% of total attendance

Reducing Water While Growing Food For People and Pollinators

Questions?

Texas A&M AgriLife Research
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@TXPlantGuy DANIEL CUNNINGHAM