Is Texas Running Out of Water?

Michael Irlbeck
EPCOR

36th Annual Texas Environmental Superconference
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Water "Scarcity"

Do we understand the issue?

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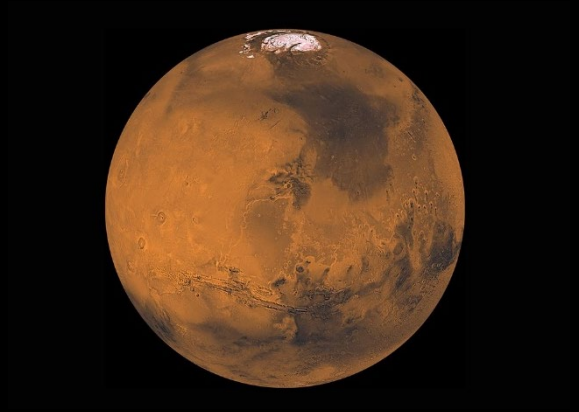
Water “Scarcity”

Mars



Earth

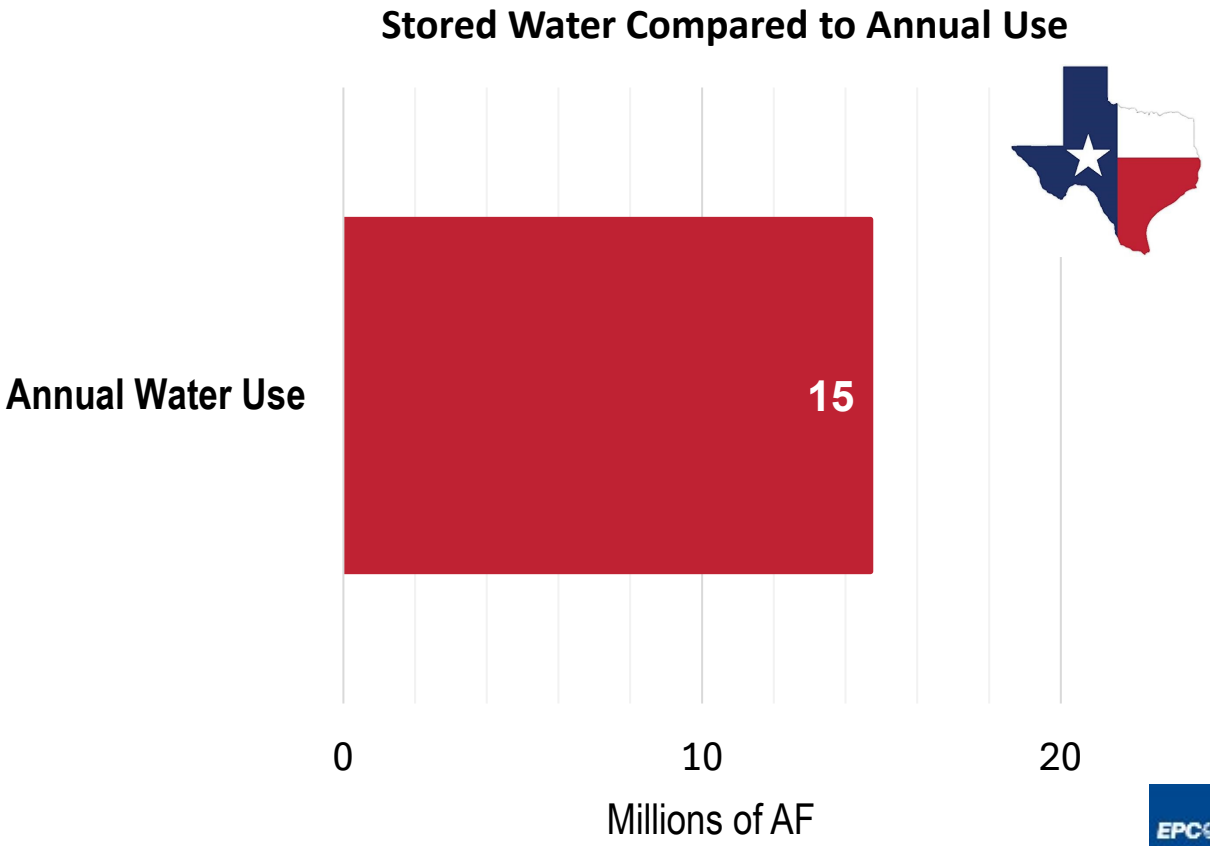
Source: NASA

Water “Scarcity”

Water Use in Texas

Today, Texas uses about **15 million AF** per year.

Agriculture uses about 63%, and Cities use about 33%.



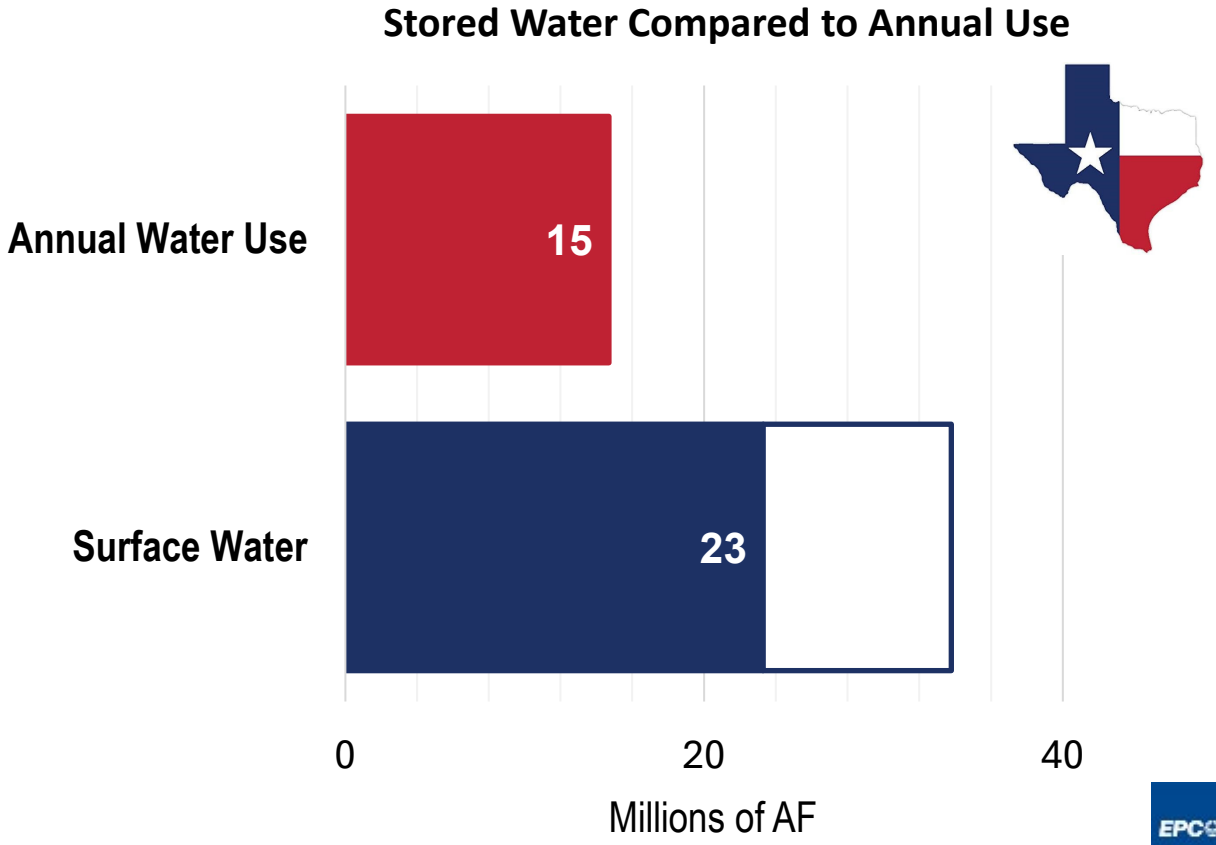
Source: TWDB

Water “Scarcity”

Surface Water

Texas has **15 major rivers** that flow about 34 million AF per year.

TWDB reports that 122 major reservoirs presently store about **25 million** AF in conservation pool.



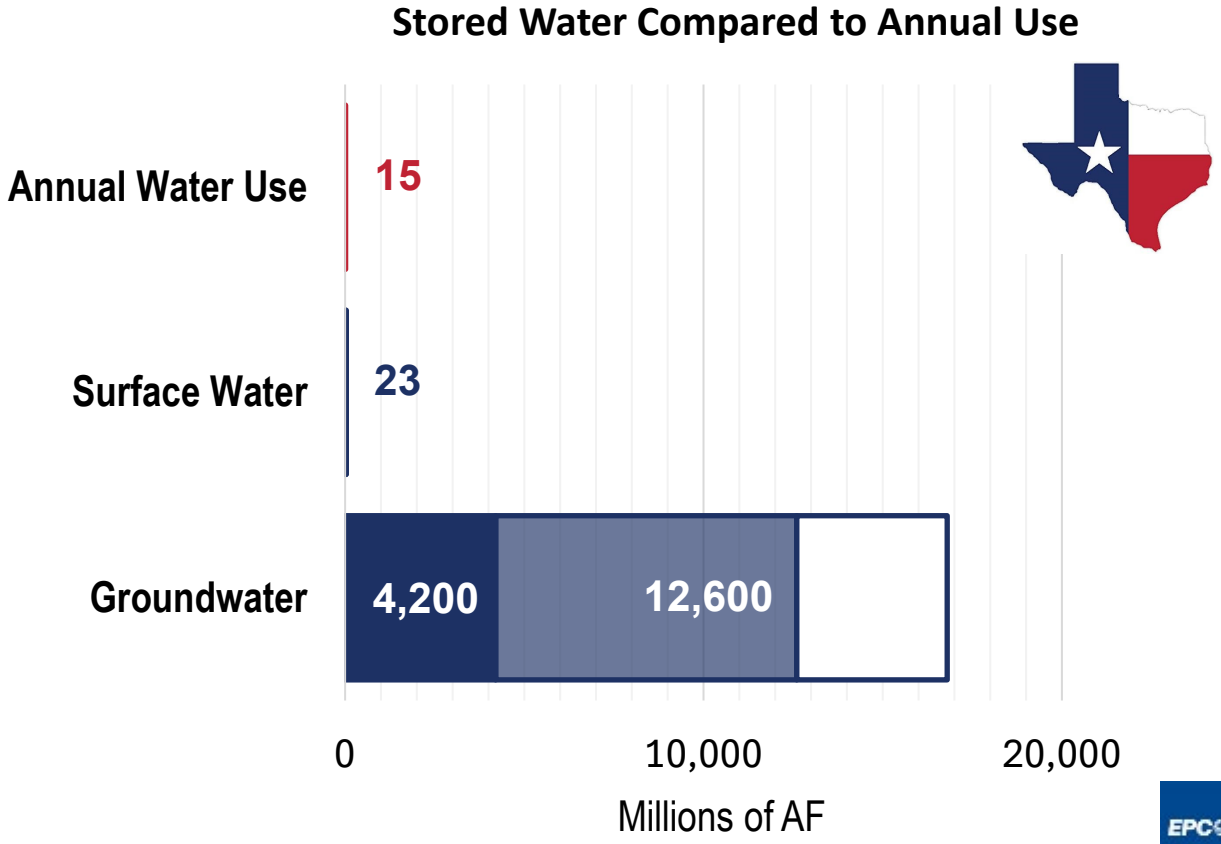
Source: TWDB

Water “Scarcity”

Groundwater

Texas has **30+ aquifers** that presently store about 17 billion AF of groundwater.

TWDB estimates that **4 to 12 billion AF** of this is recoverable.



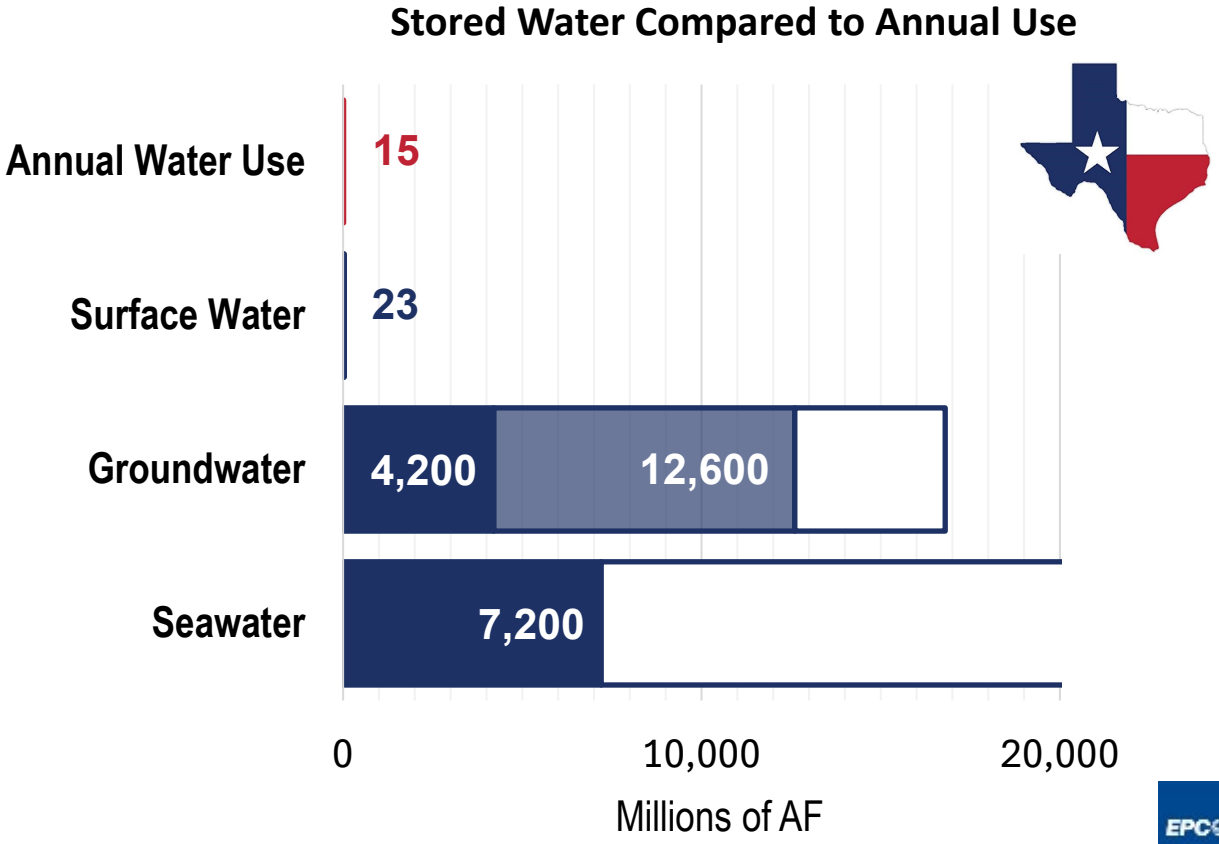
Source: TWDB

Water “Scarcity”

Seawater

The **Gulf of Mexico** stores about 2 trillion AF of seawater.

Of this, about **7 billion AF** is recoverable with an intake 20 feet deep.

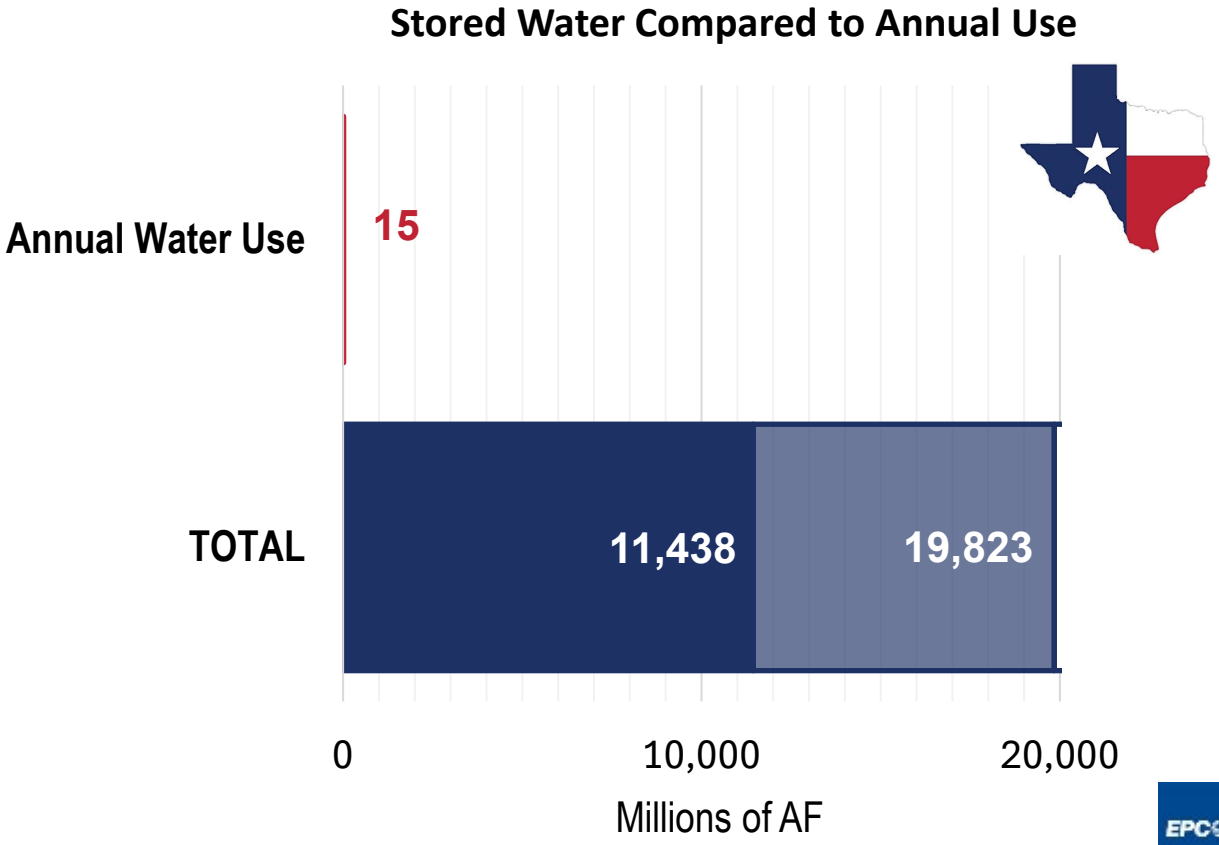


Source: TWDB and USFWS

Water “Scarcity”

In total, **Texas has 11 to 20 billion AF** of recoverable water in storage today.

Or, Texas has enough water in storage today to last **7 to 13 centuries** without any rainfall or recharge.

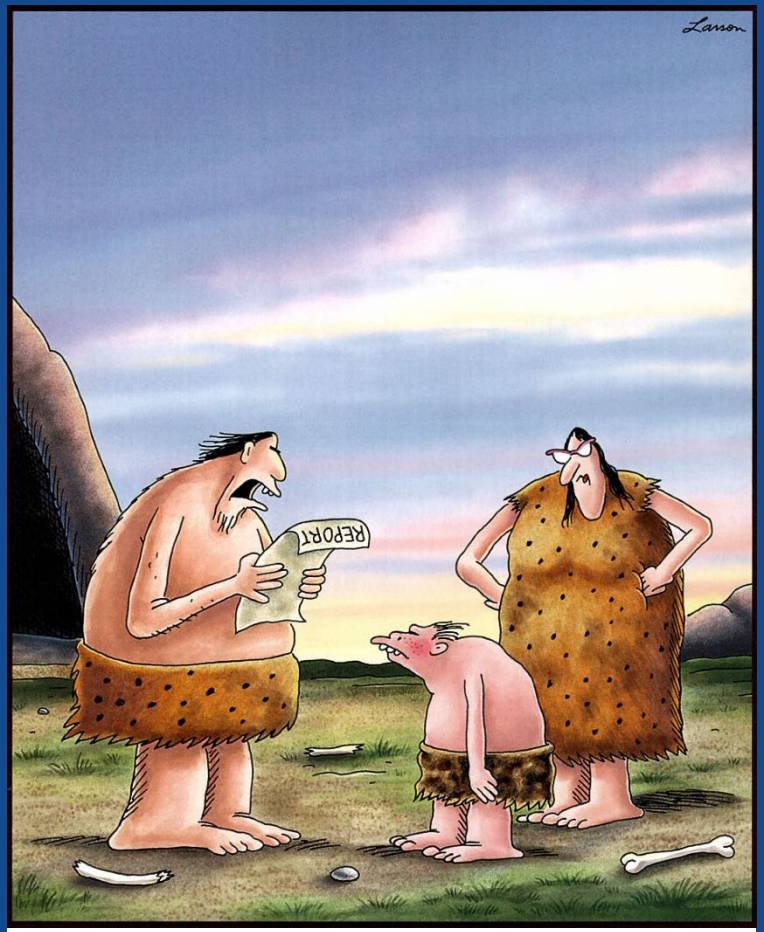


Source: TWDB and USFWS

Water “Scarcity”

So… if water is abundant,

what are we experiencing?



"Oh, look, this get better … 'F' in history!
You even flunk something not happen yet!"

Water History

Action after Crisis

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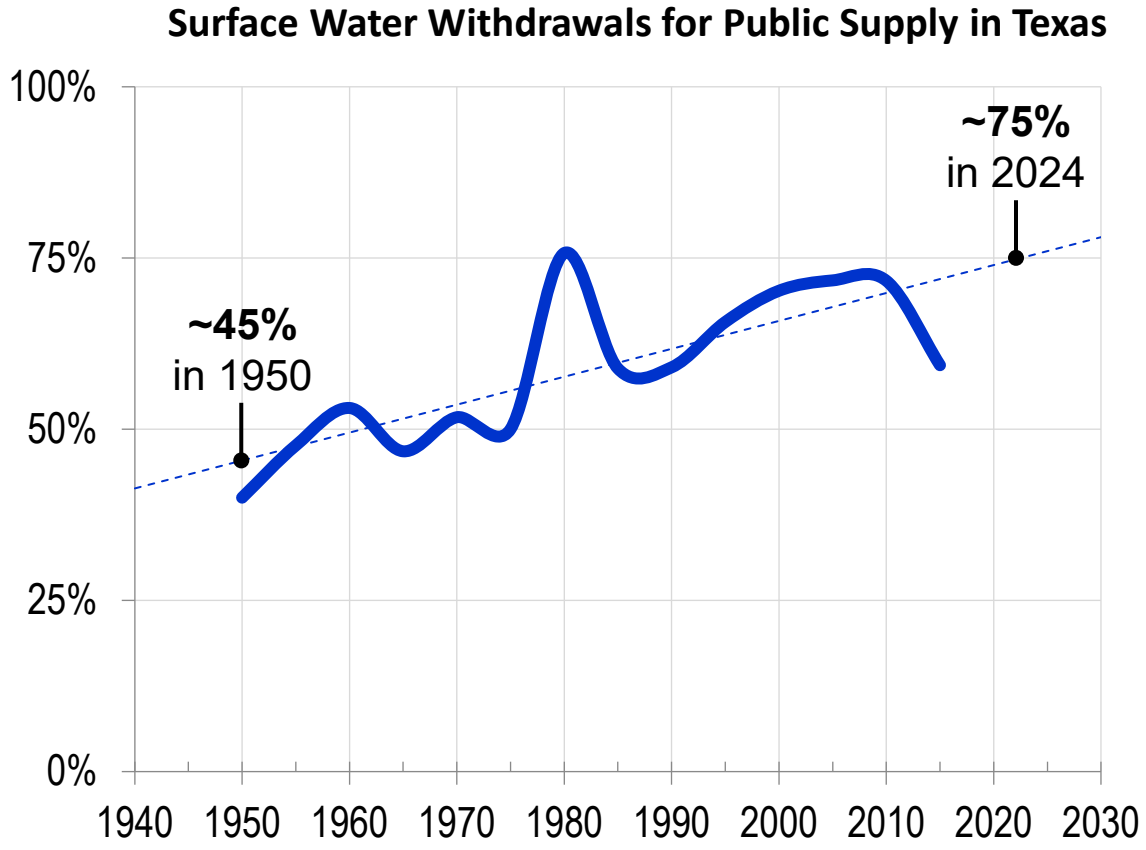
Water History

Over the past 70 years, cities in Texas have increased their reliance on surface water.

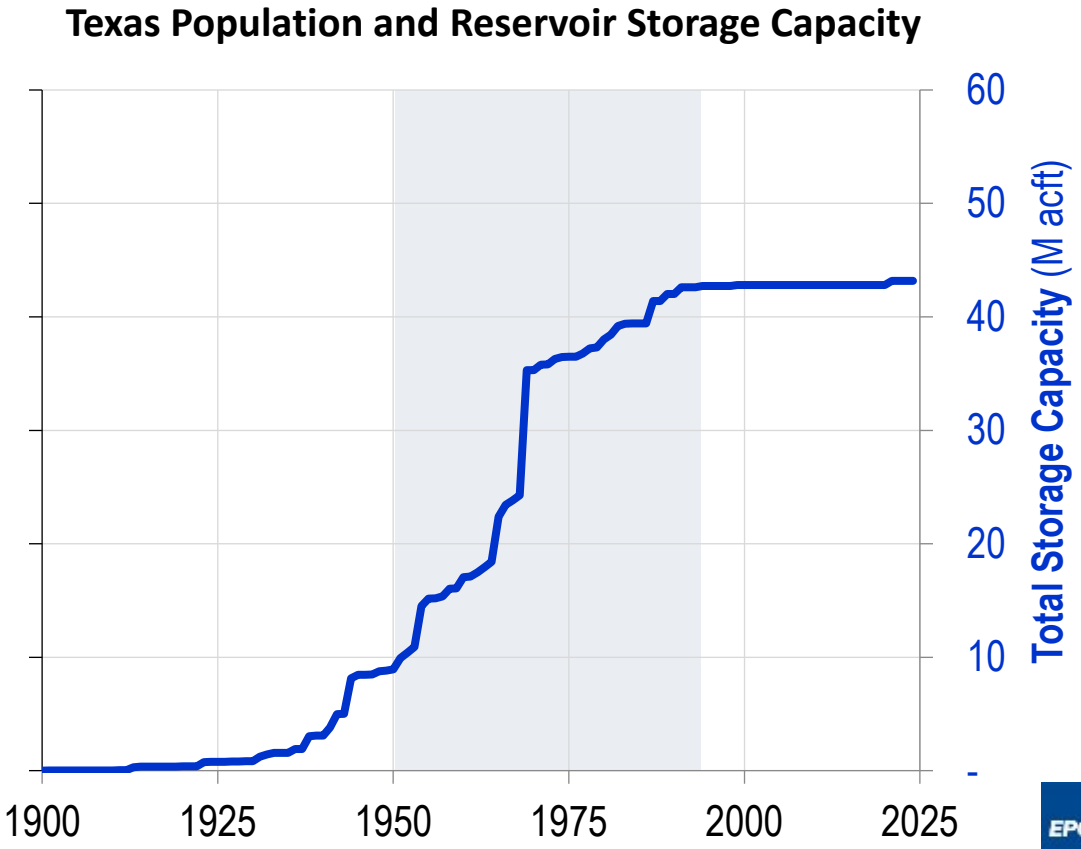


Source: USGS 2015

Water History

75% of Texas' reservoir storage capacity was built in a single generation in response to the 1950's drought.

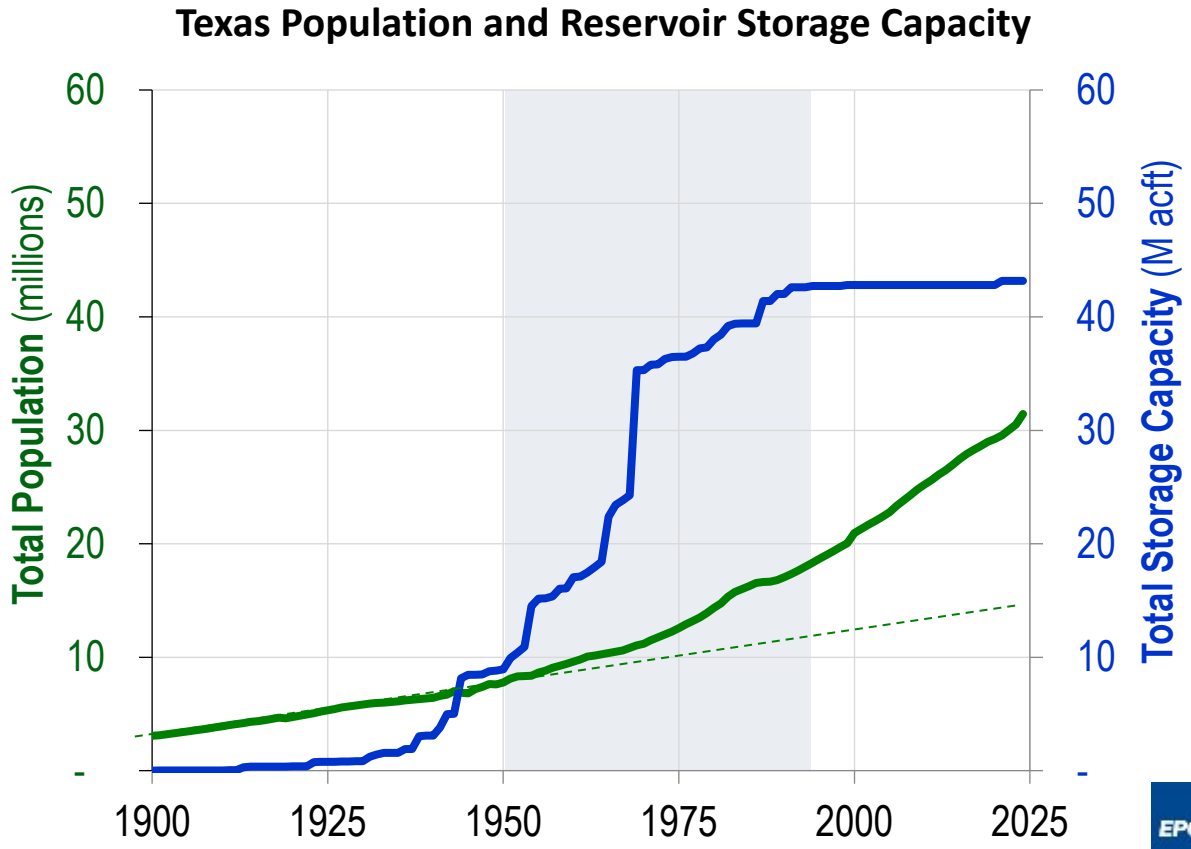
But by 1990, Texas essentially stopped building new reservoirs.



Source: TWDB 2022

Water History

Beginning about 1950, Texas' population began to increase exponentially.



Source: TWDB 2022 and US Census Bureau 2020

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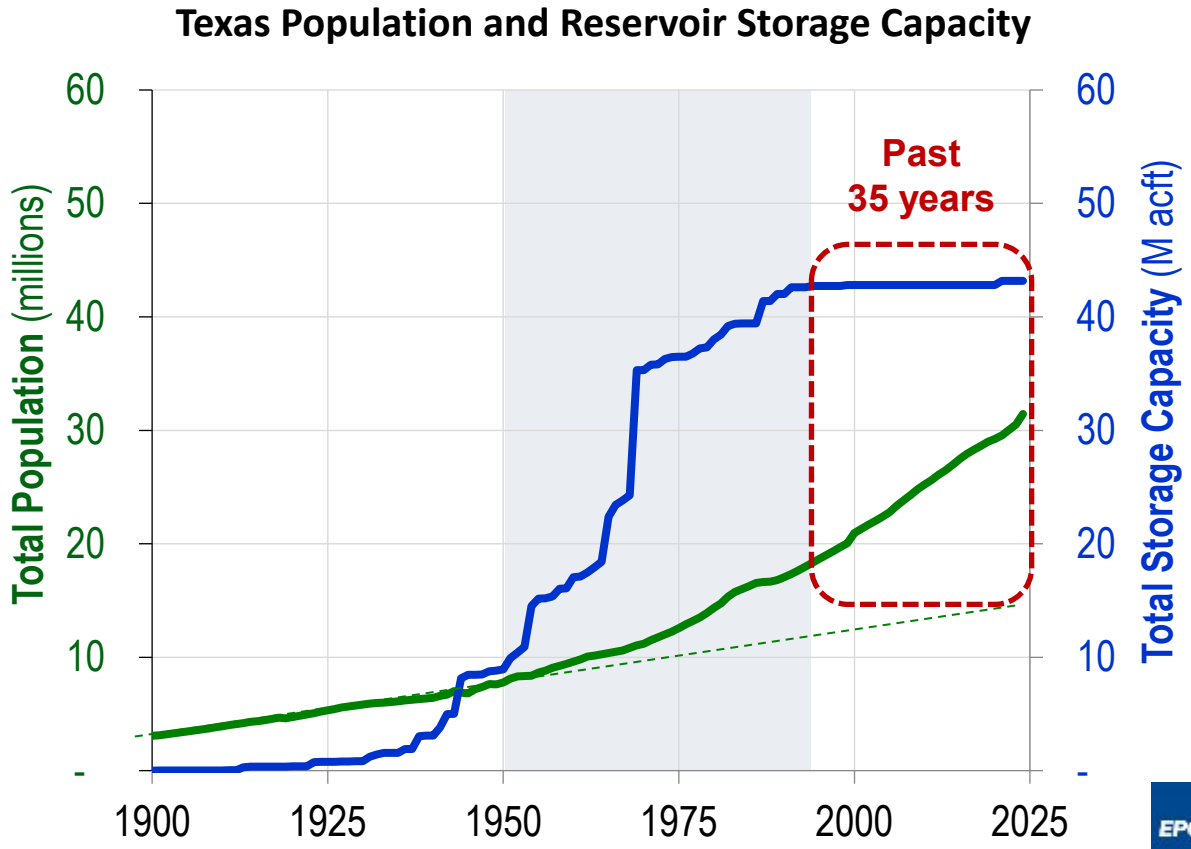
Water History

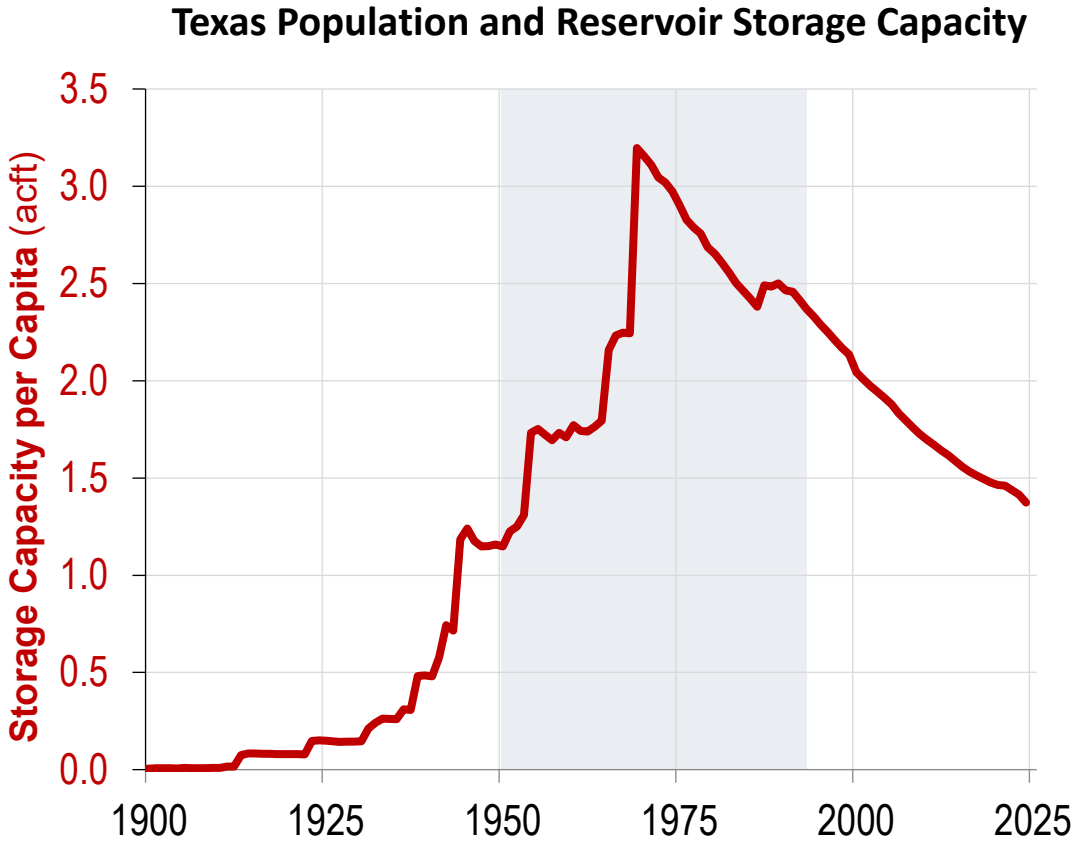
Since 1990, Texas has enjoyed historic population growth <u>without</u> having to build new surface water supplies.



Source: TWDB 2022 and US Census Bureau 2020

Water History

The ratio of **storage capacity per capita** is a good index of Texas' relative insulation from drought events.

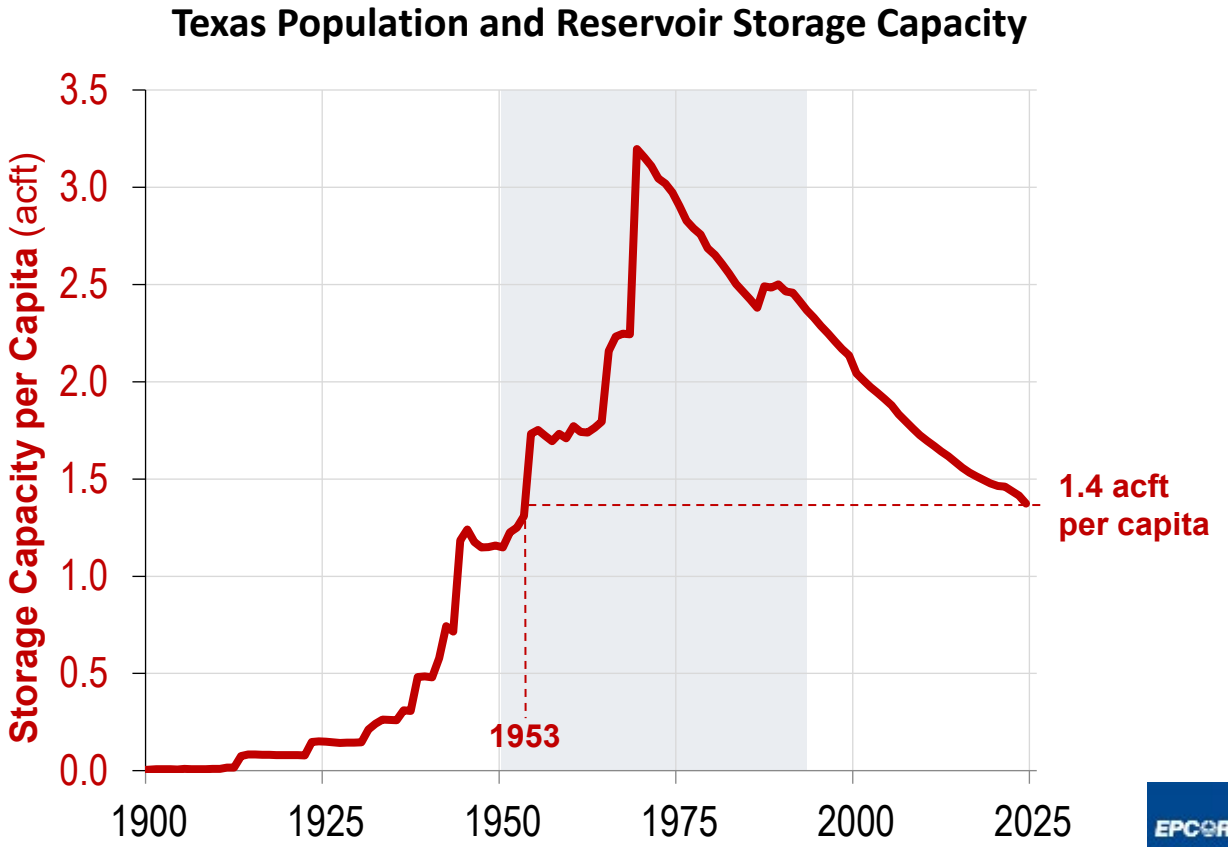


Source: TWDB 2022 and US Census Bureau 2020

Water History

Today, **Texas has the same reservoir storage capacity per capita as it had in 1953.**

But now, 75% of our Public Supply depends on surface water.



Source: TWDB 2022 and US Census Bureau 2020

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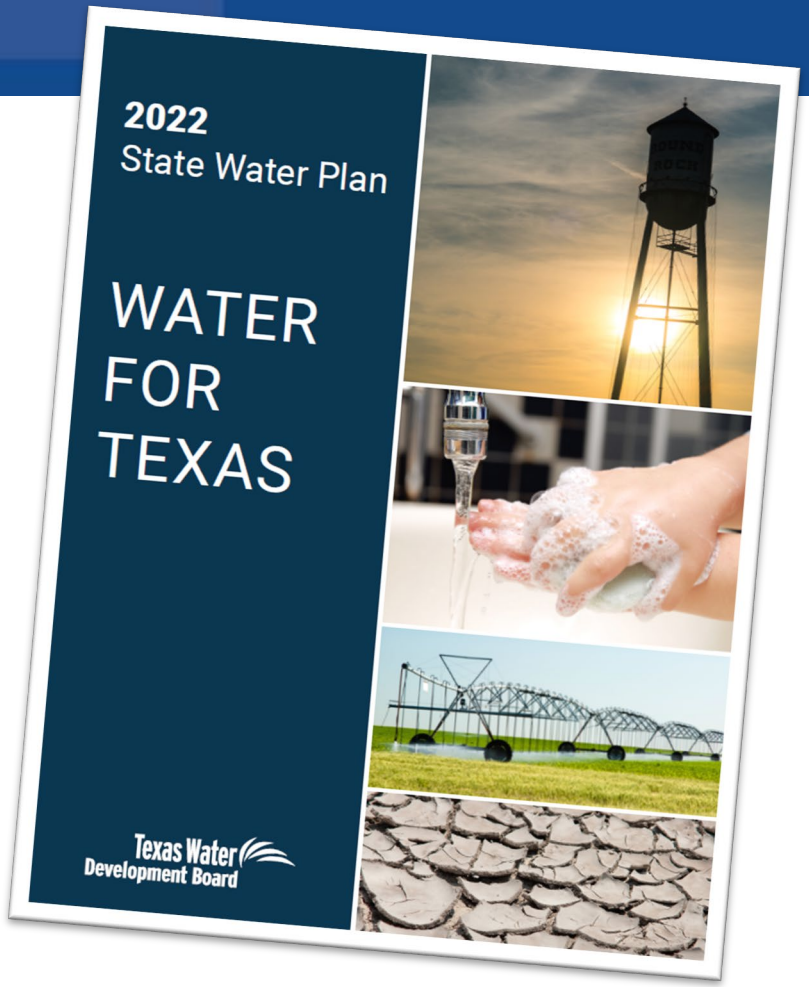
Water History

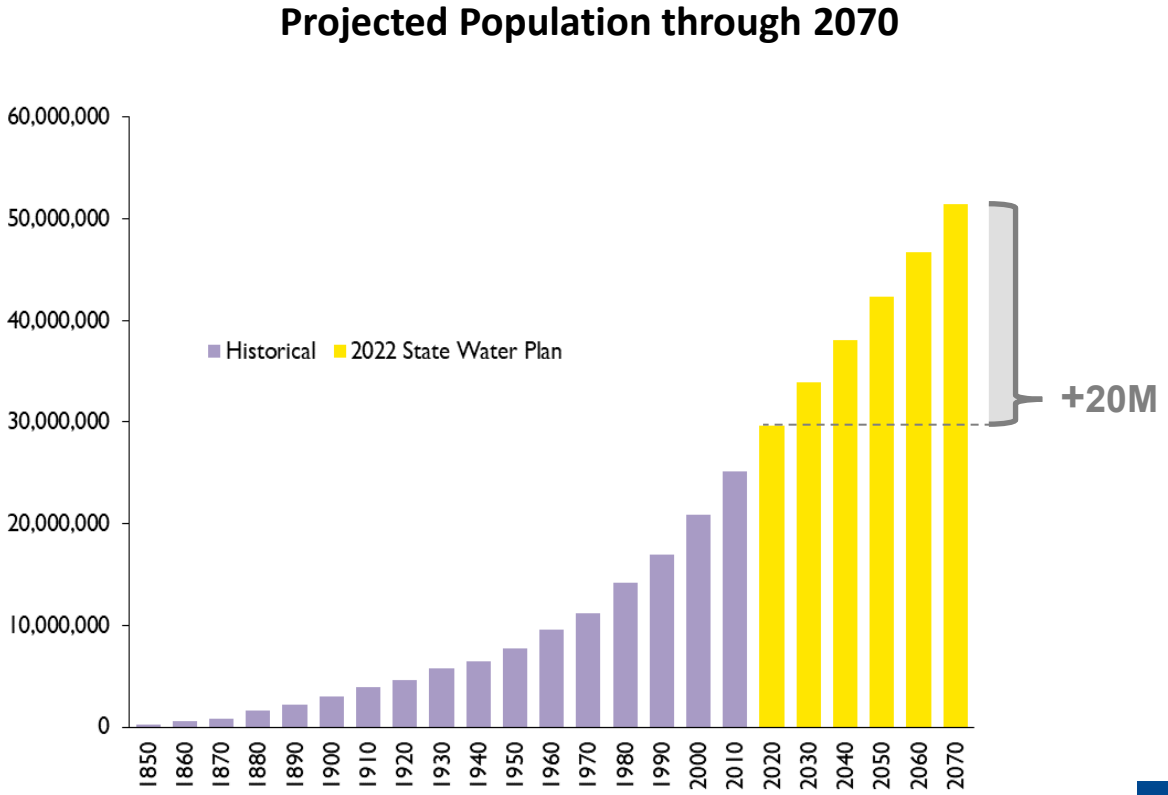
Every five years, Texas assesses its projected water supplies and water demands at a regional level.



Source: TWDB 2022

Water History

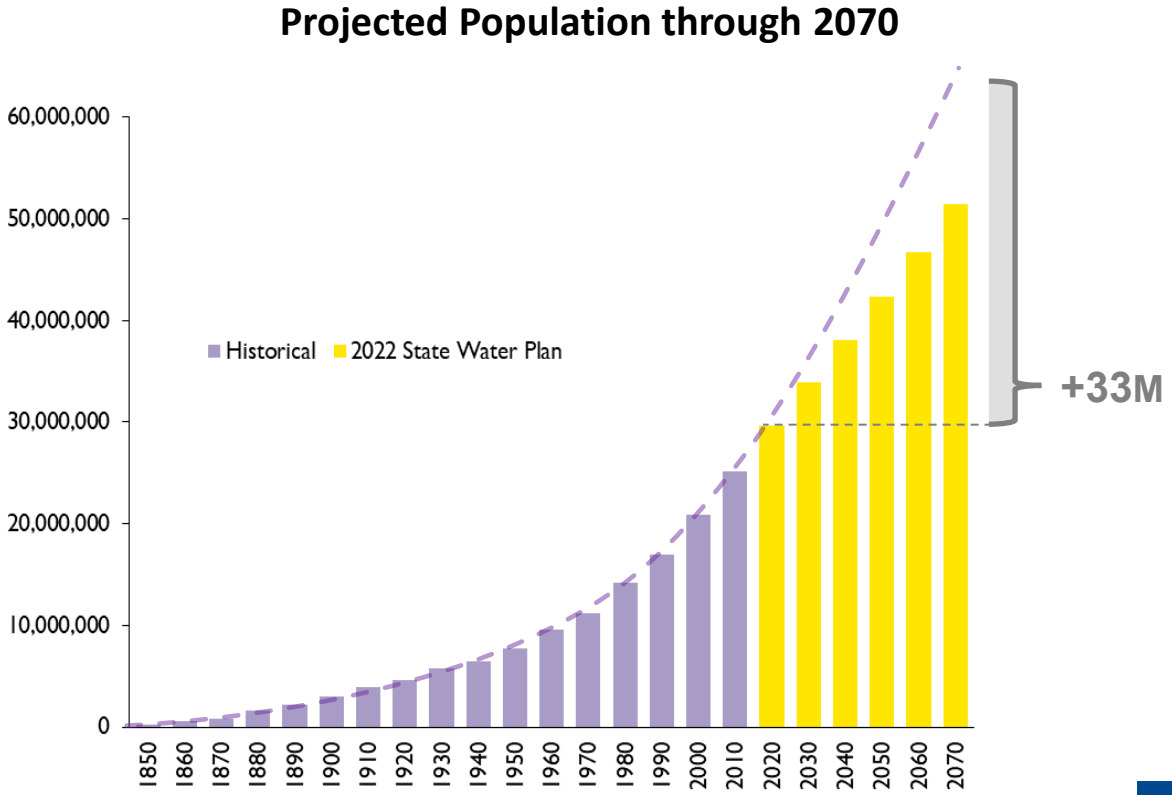
Over the next 50 years, Texas' population is projected to continue to increase, from about 30M to **over 50M**.



Source: TWDB 2022

Water History

However, if Texas' current growth rate continues, the population will more than double in 50 years to **over 60M**.



Source: TWDB 2022

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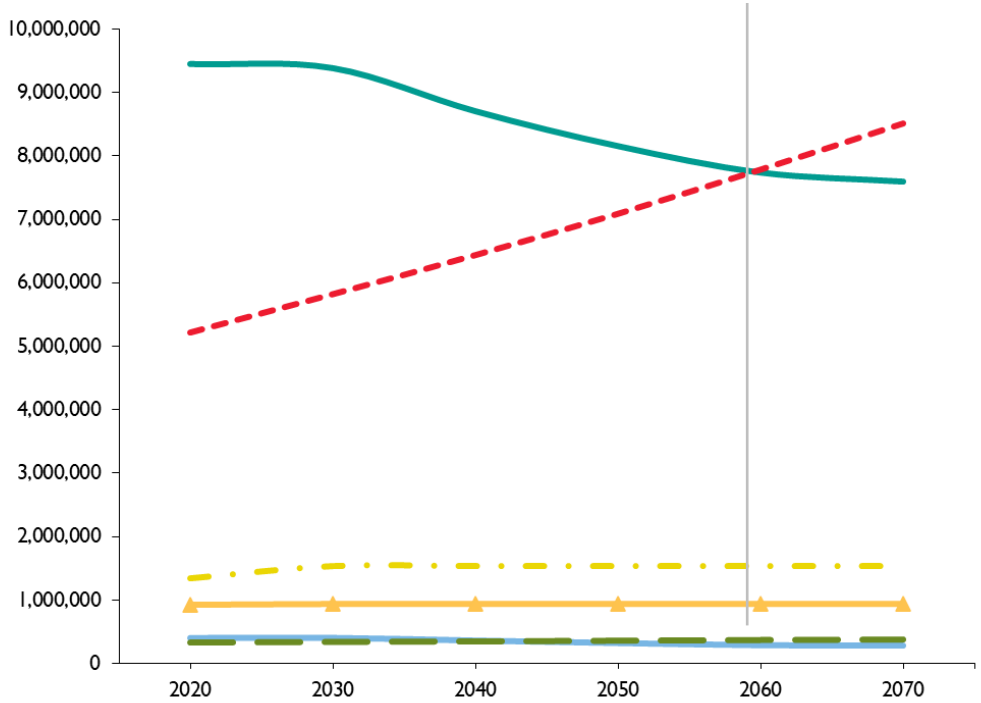
Water History

By 2060, Municipal users are projected to be the single largest water user group in Texas.

Projected Population through 2070



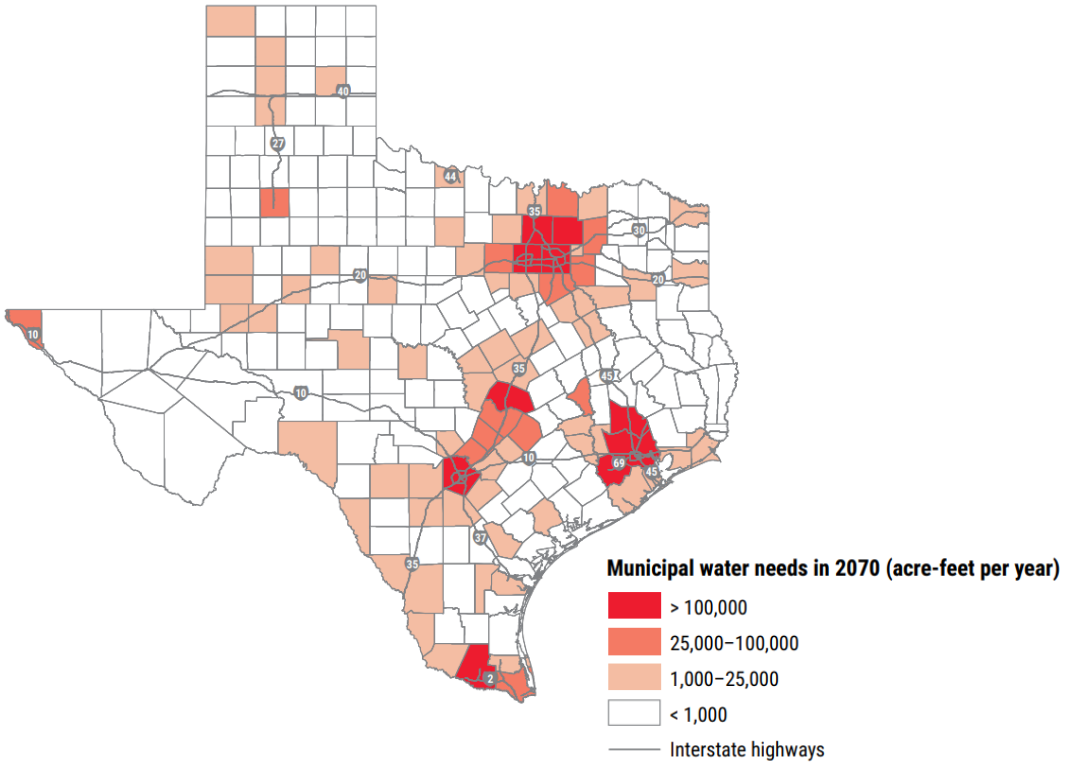
Source: TWDB 2022

Water History

Texas is increasingly becoming urbanized.

This will further concentrate significant water demands within relatively small regional geographies.

Projected Municipal Water Need by 2070

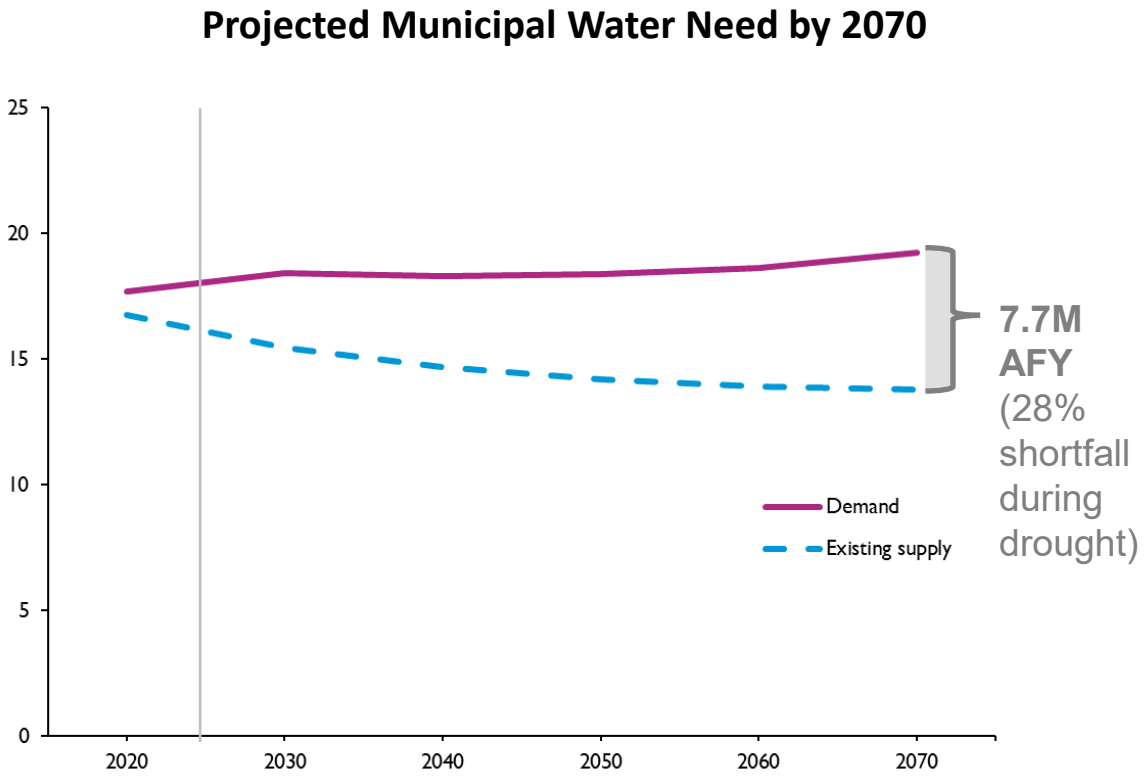


Source: TWDB 2022

Water History

Today, Texas does not have enough water supply to meet all demands in a drought.

This shortfall is expected to increase through 2070.



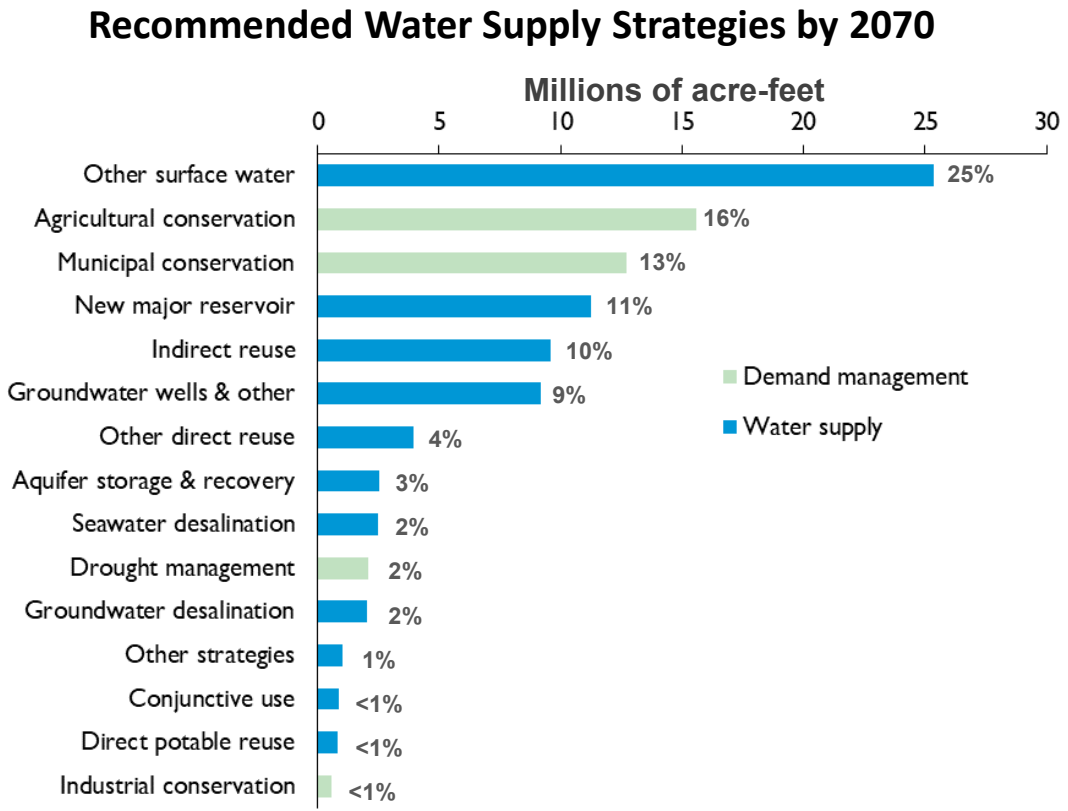
Source: TWDB 2022

Water History

2022 State Water Plan

5,800 water supply strategies have been recommended meet the 7.7M AFY shortfall.

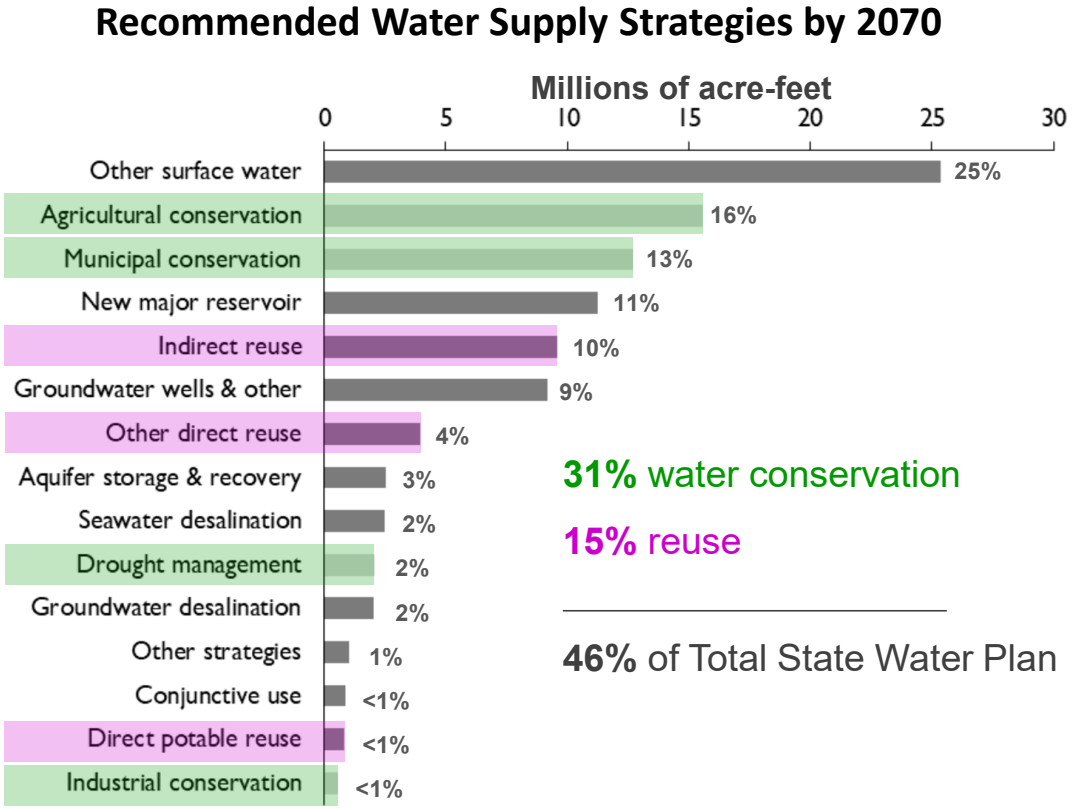
This will require an estimated investment of **$80B** in new infrastructure.



Source: TWDB 2022

Water History

46% of the Plan (3.5M AFY) seeks to use less and reuse (i.e., make existing supplies go farther).



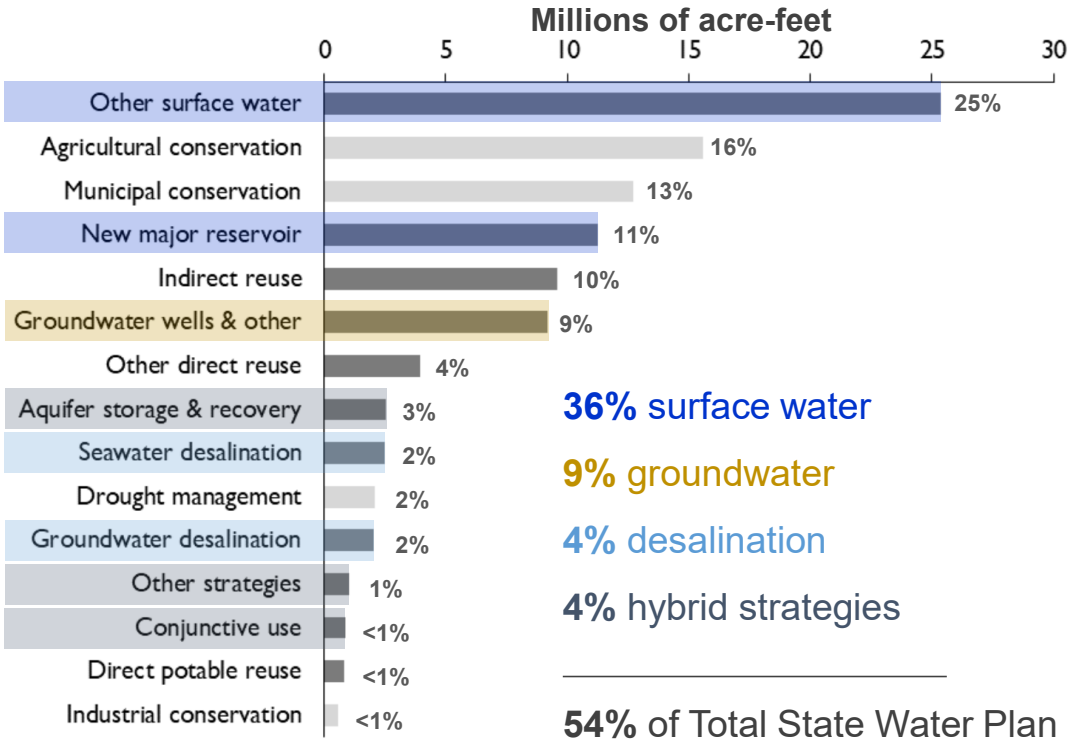
Source: TWDB 2022

Water History

54% of the Plan (4.2M AFY) seeks to develop new “wet” supplies.

Most new supply is surface water.

Recommended Water Supply Strategies by 2070



36% surface water

9% groundwater

4% desalination

4% hybrid strategies

54% of Total State Water Plan

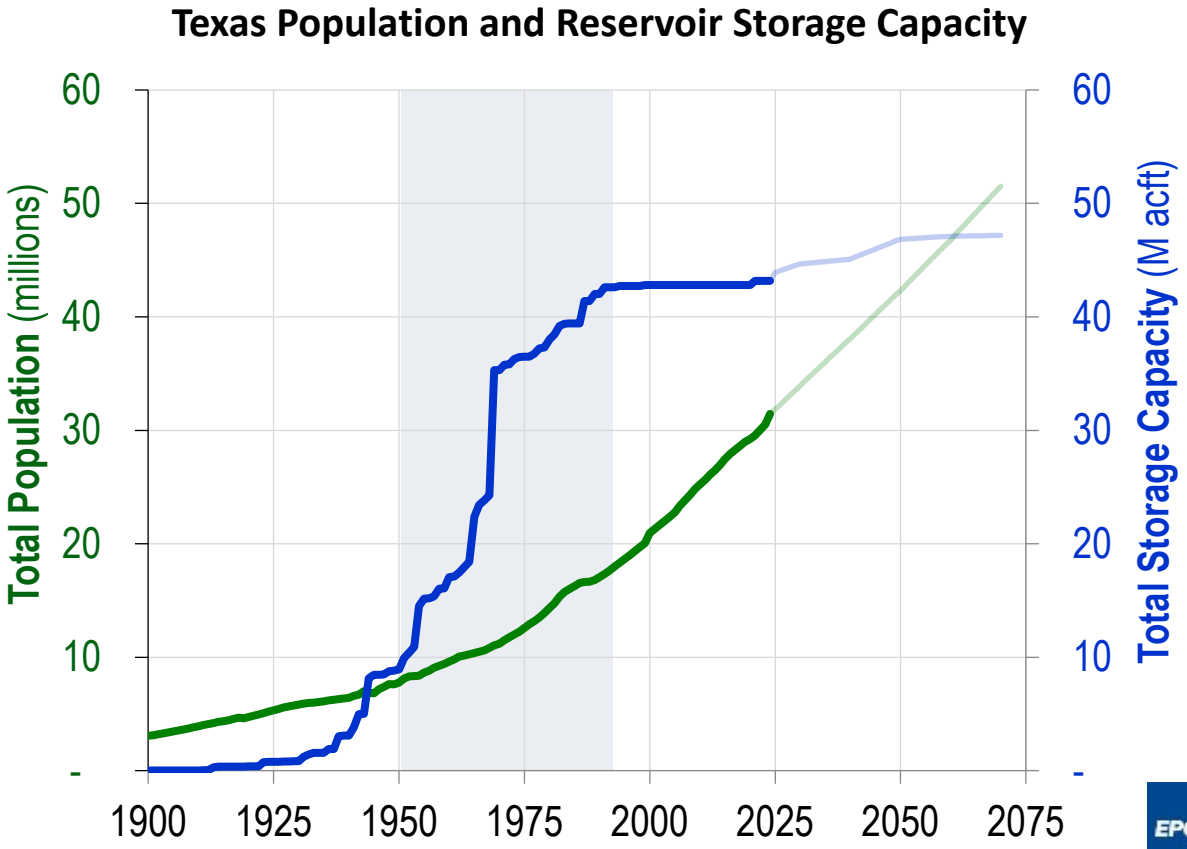
Source: TWDB 2022

Water History

2022 State Water Plan

BEST CASE scenario:

- Texas grows by only 22M more people; and
- Texas builds all 23 recommended new reservoirs.



Source: TWDB 2022 and US Census Bureau 2020

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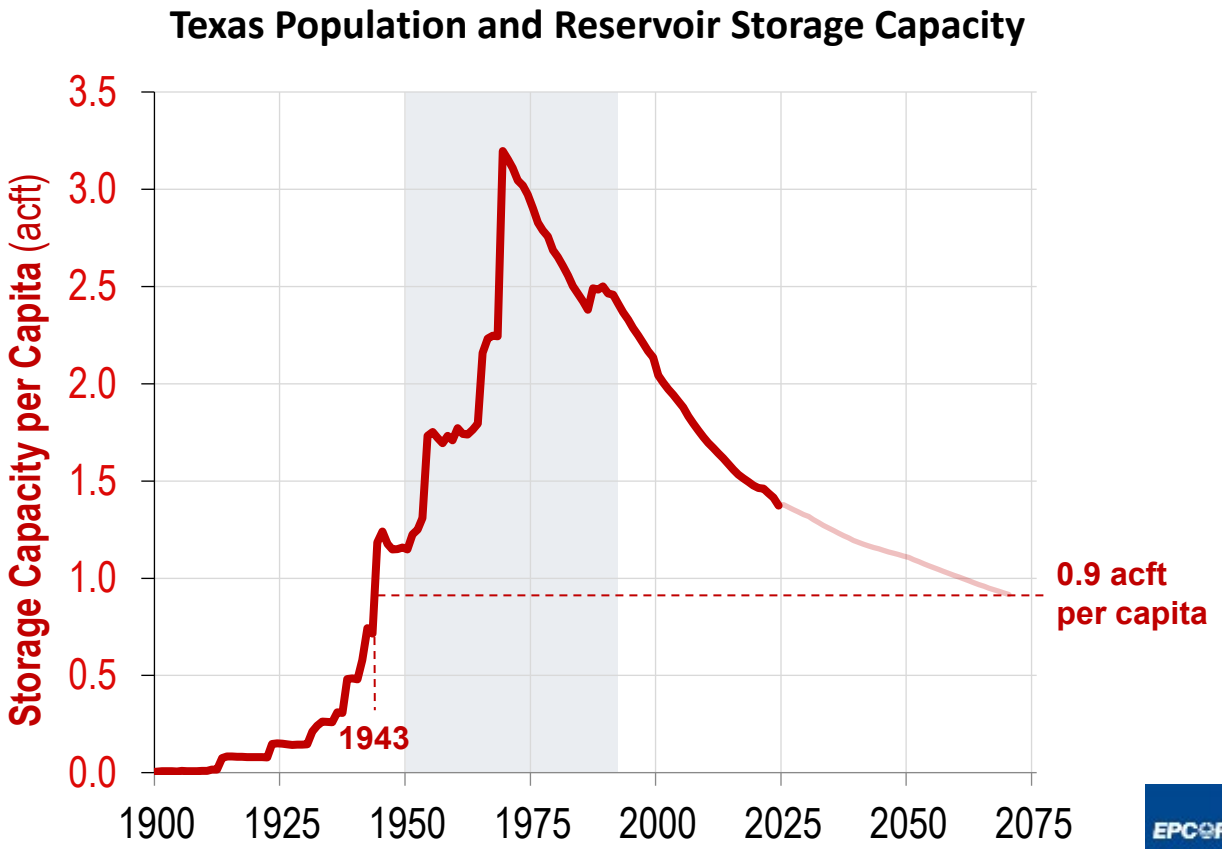
Water History

2022 State Water Plan

BEST CASE scenario:

- Texas' relative insulation from drought events is **reduced by one-third**.



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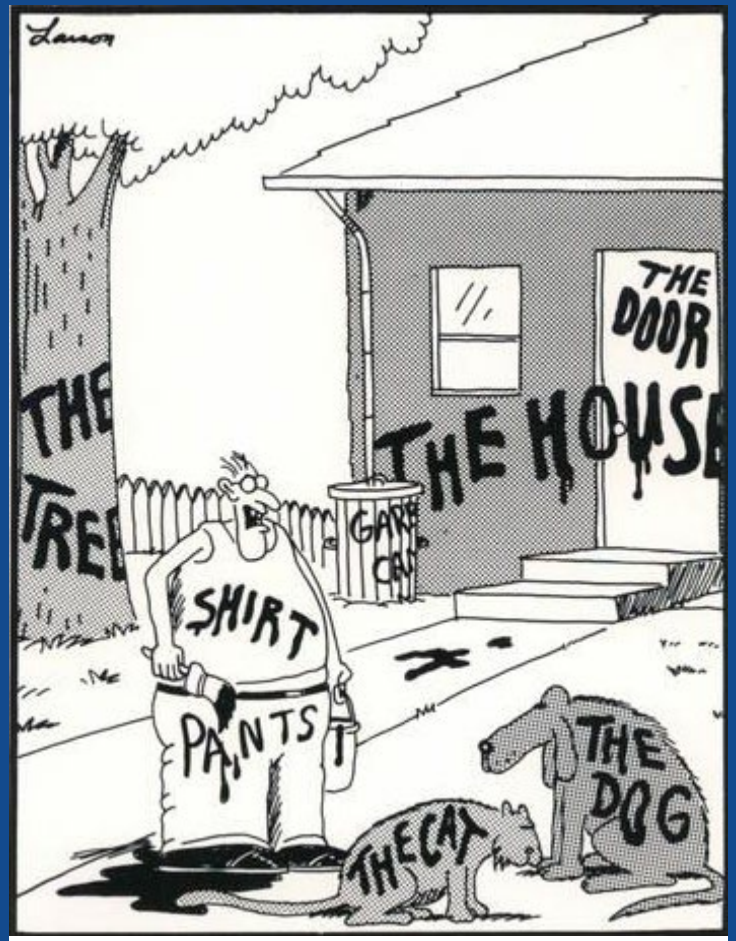
Water History

So… if water is abundant,

what are we experiencing?



"Now! . . . *That* should clear up a few things around here!"

Water Algebra

Getting to the Issue

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Water Algebra

Water ≠ Water Supply

Water Algebra

Water ≠ Water Supply

≠

Water Algebra

Water ≠ Water Supply

Water + Infrastructure = Water Supply

Water Algebra

Water + Infrastructure = Water Supply

Dubai gets <4 inches of rain per year and has never recorded a freezing temperature.

3.6M residents use 132 gallons each day, most of which (448 MGD) is from desalinated seawater.

Source: Arielle Paul, The National, 2022

Water Algebra

Water + Infrastructure = Water Supply

Human life has been continuously sustained in a water-less environment for 23 years and counting.

The ISS is located 254 miles from the nearest water source.

Source: NASA, 2024

Water Algebra

Water ≠ Water Supply

Water + Infrastructure = Water Supply

(Water + Permits) + (Customer + Capital) = **Water Supply**

Water Algebra

Water ≠ Water Supply

Water + Infrastructure = Water Supply

(Water + Permits) + (Customer + Capital) = **Water Supply**

Natural Resources

Social Economics

EPCOR

Water Algebra

Water ≠ Water Supply

Water + Infrastructure = Water Supply

✓ ✓ ? ?

(Water + Permits) + (Customer + Capital) = **Water Supply**

Natural Resources

Social Economics

EPCOR

Water Algebra

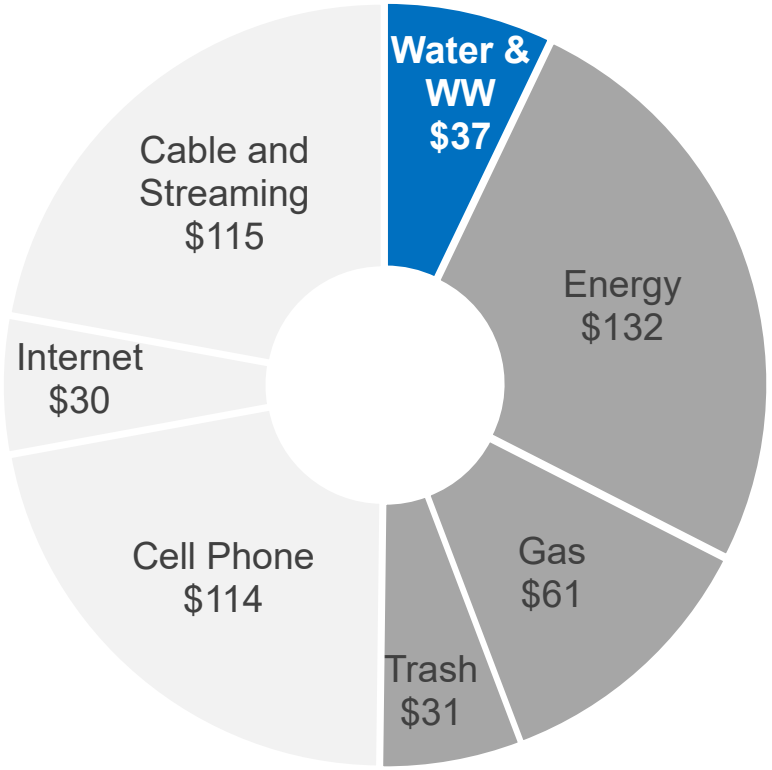
Customer + Capital = Infrastructure

Water and Wastewater Services account for only 7% of the average monthly utility bill in Texas.

The average utility bill has **doubled** in just 30 years due to digital technology.

Source: Forbes and CNET

Average Monthly Utility Bill in Texas (2023)



Water Algebra

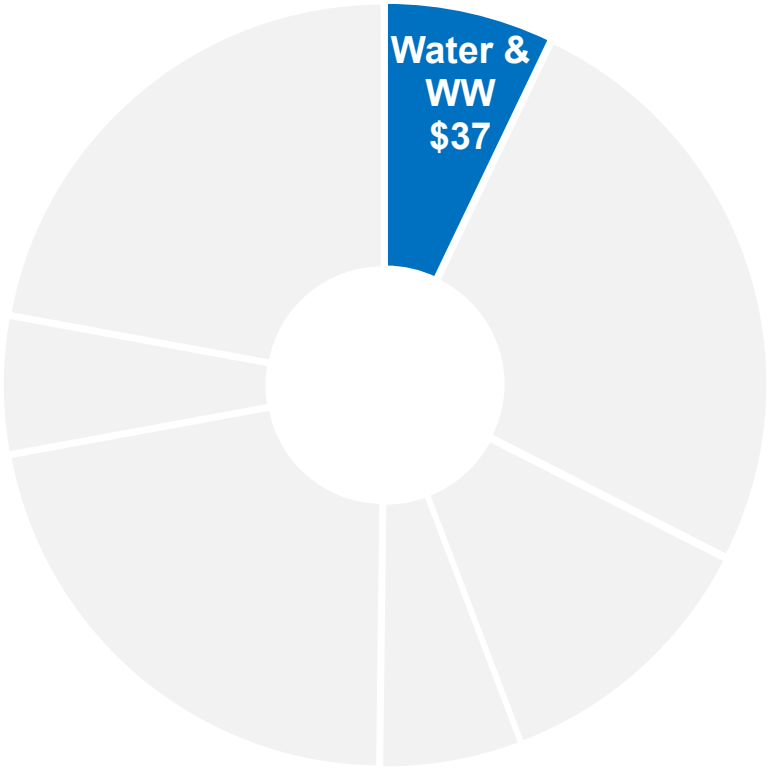
Customer + Capital = Infrastructure

For the past 35 years, Texas has enjoyed historic growth without having to pay for new water supply infrastructure.

Texas' Ratepayers are conditioned to a false sense of what water supply really costs.

Source: Forbes and CNET

Average Monthly Utility Bill in Texas (2023)



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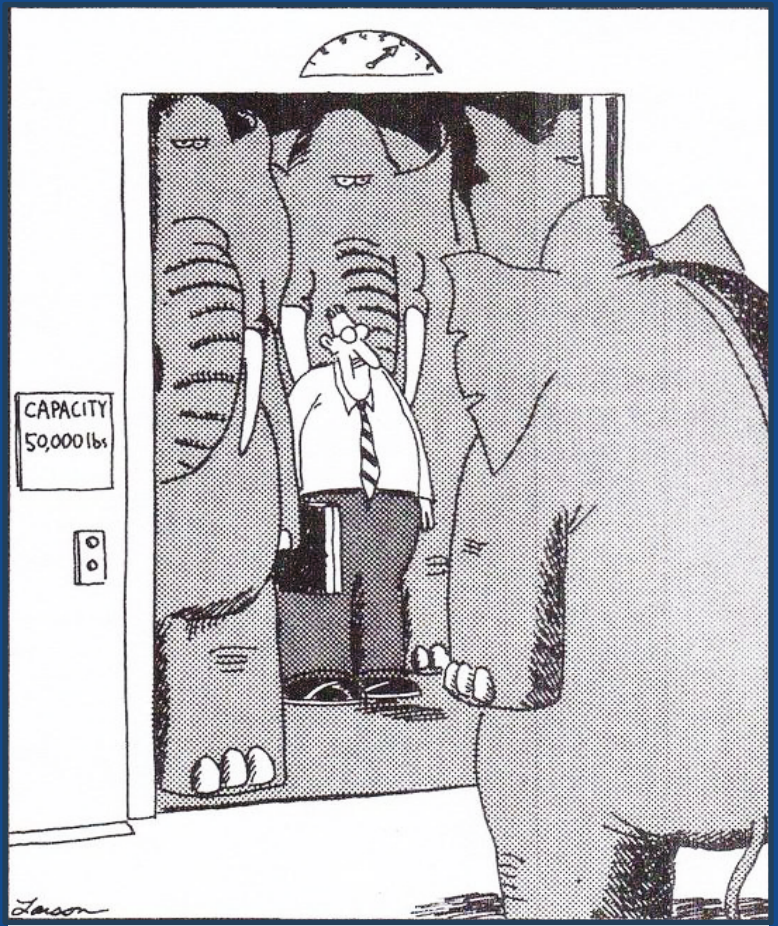

Already concerned, Ernie watched in horror as one more elephant tried to squeeze on.

Going Forward

Action Before Crisis?

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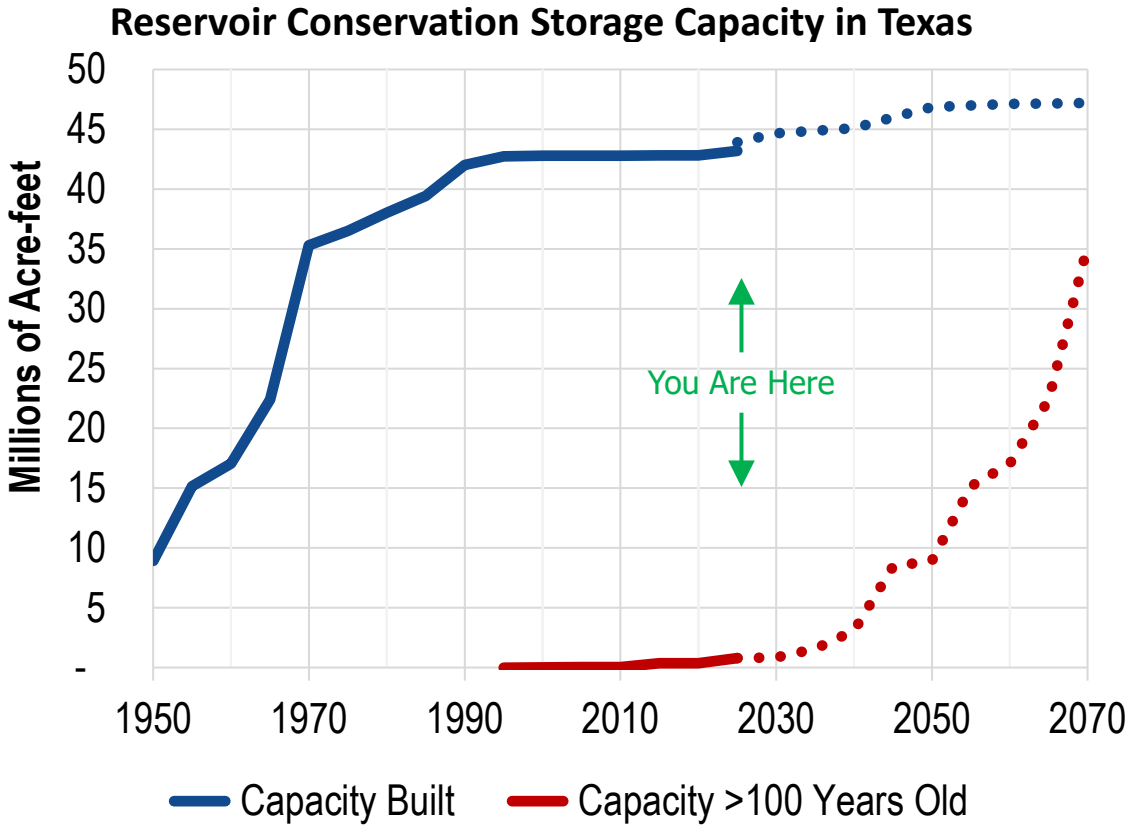
Going Forward

75% of Texas' Public Supply comes from surface water, but…

Texas' dam infrastructure is getting old.

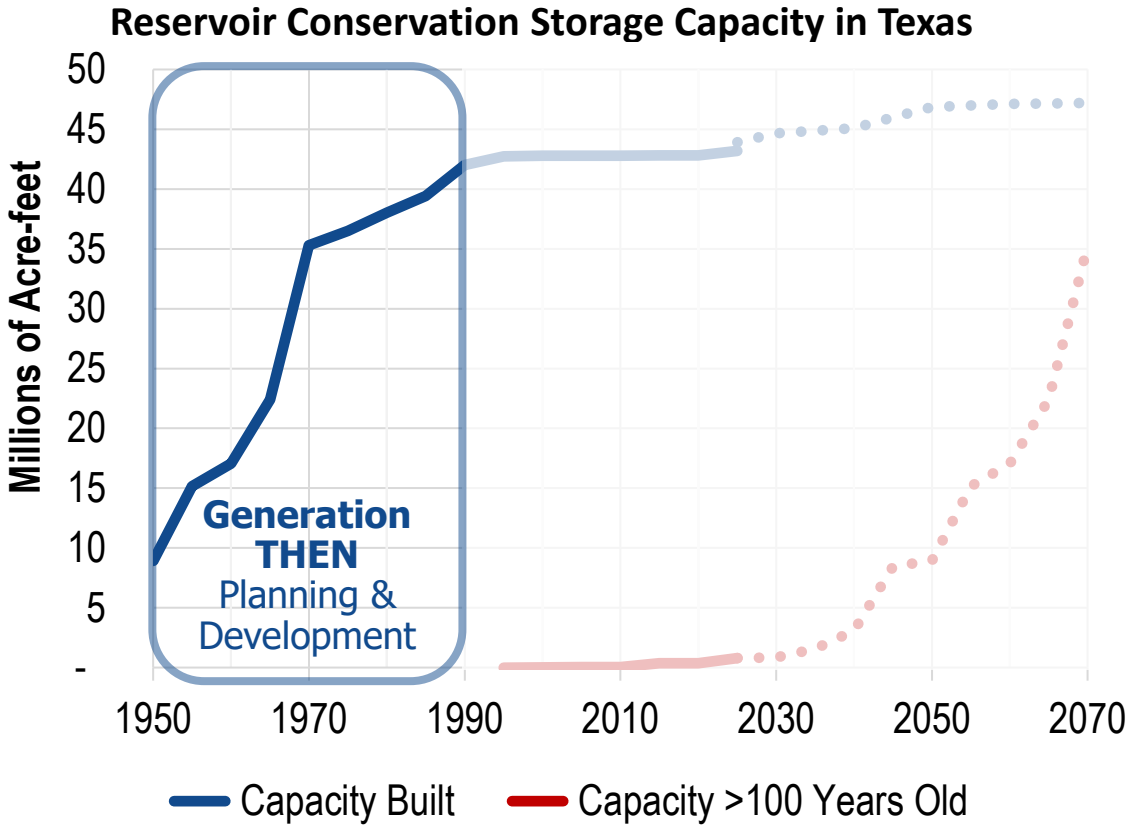


Source: TWDB

Going Forward

The **prior generation** made an unprecedented investment in surface water infrastructure in response to the 1950s drought.

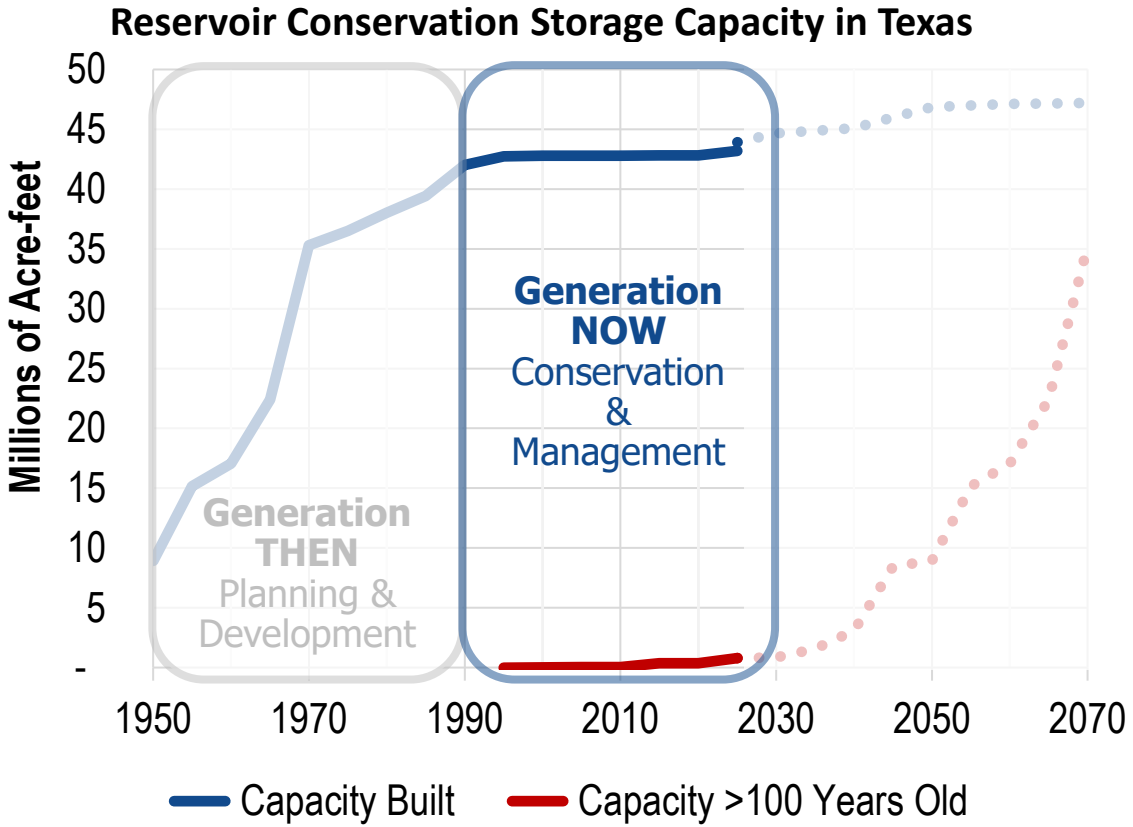
This investment was undoubtedly reflected in historic rate increases for Texas customers.



Source: TWDB

Going Forward

This generation has primarily focused on getting the most out of existing supplies.

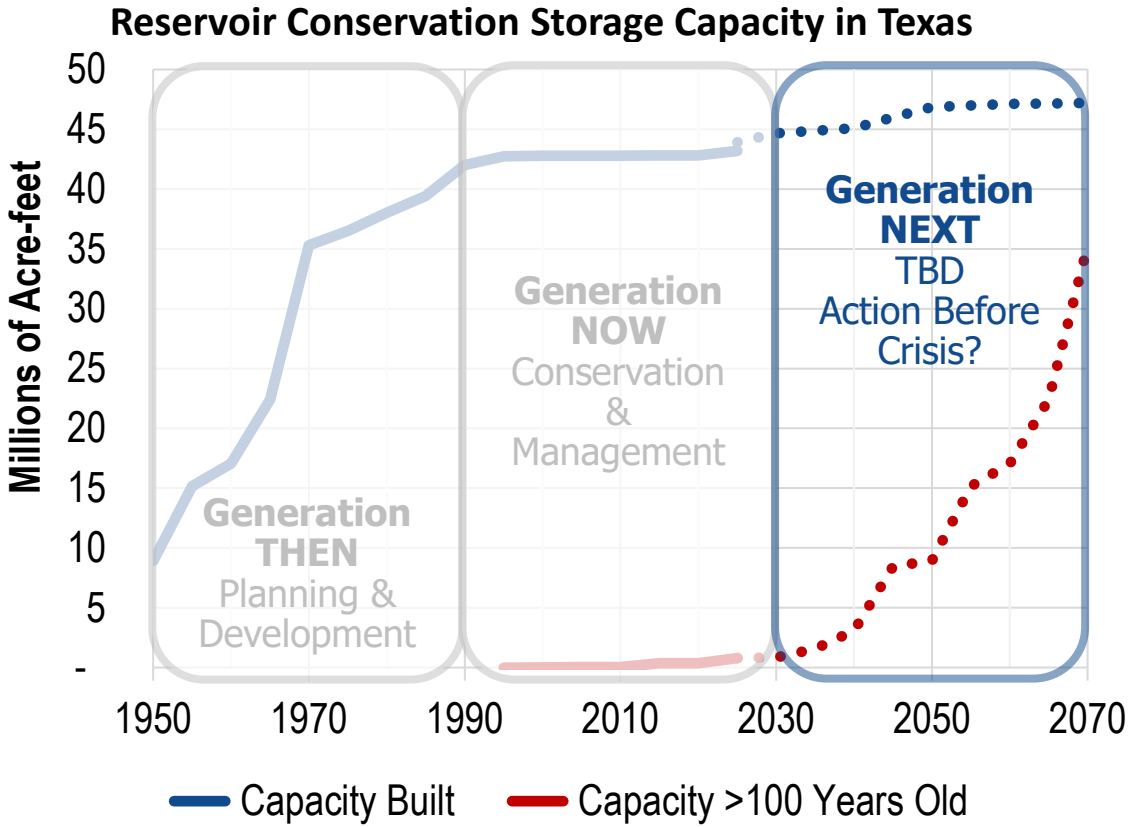


Source: TWDB

Going Forward

By 2070, the **next generation** will face the combination of increasing demand and aging infrastructure:

- 2x the population, and
- 82% of conservation storage capacity will be physically impounded by steel and concrete that has exceeded its design life (>100 years old).



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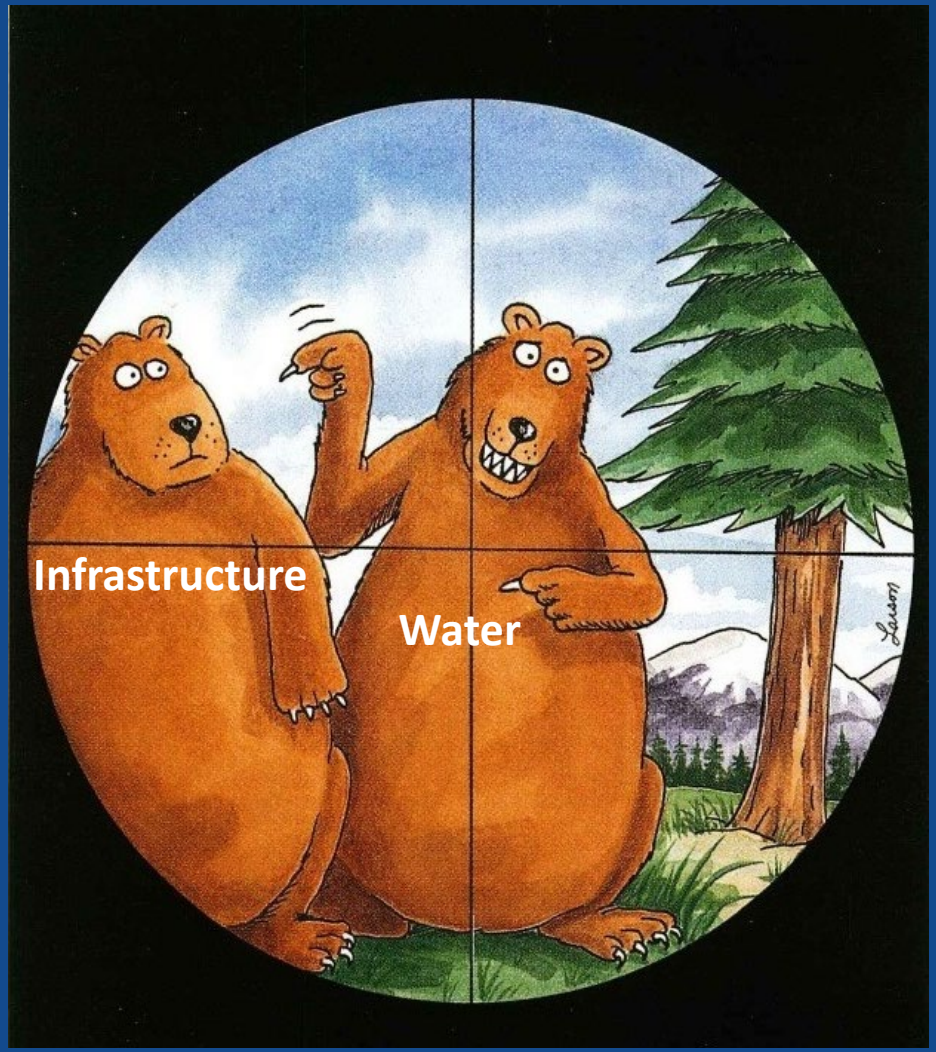

Conclusion

Texas is not running out of water.

It is running out of infrastructure.