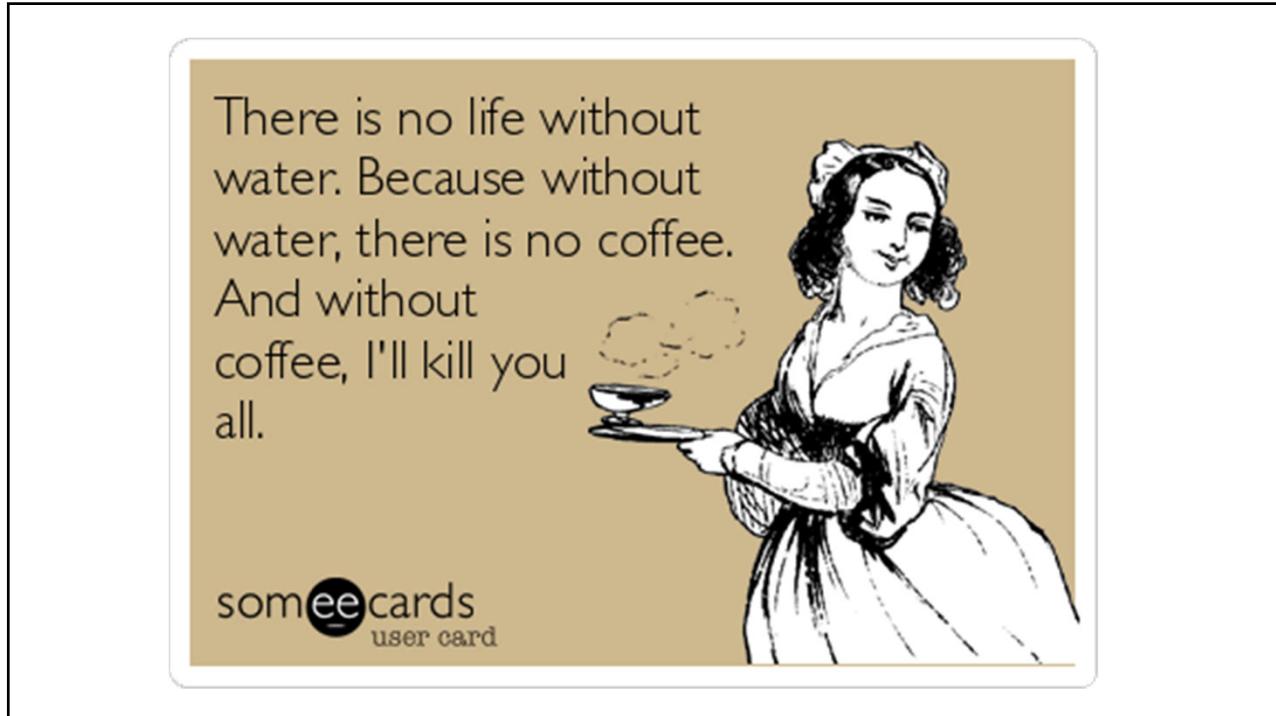


Groundwater and Surface Water in Texas

Robert E. Mace, Ph.D., P.G.
Meadows Center for Water and the Environment
Texas State University

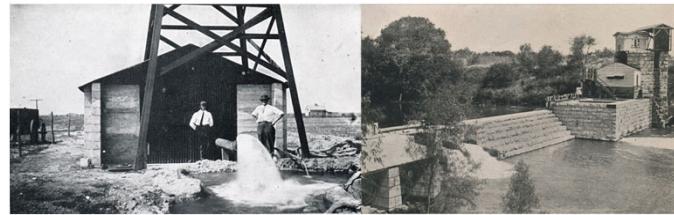
presented to
Central Texas Master Naturalist 2019 Class
San Marcos, Texas; February 9, 2019

1



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outline:



- Water in Texas!
- Capturing Water in Texas!
- Water Management in Texas!
- Resources!

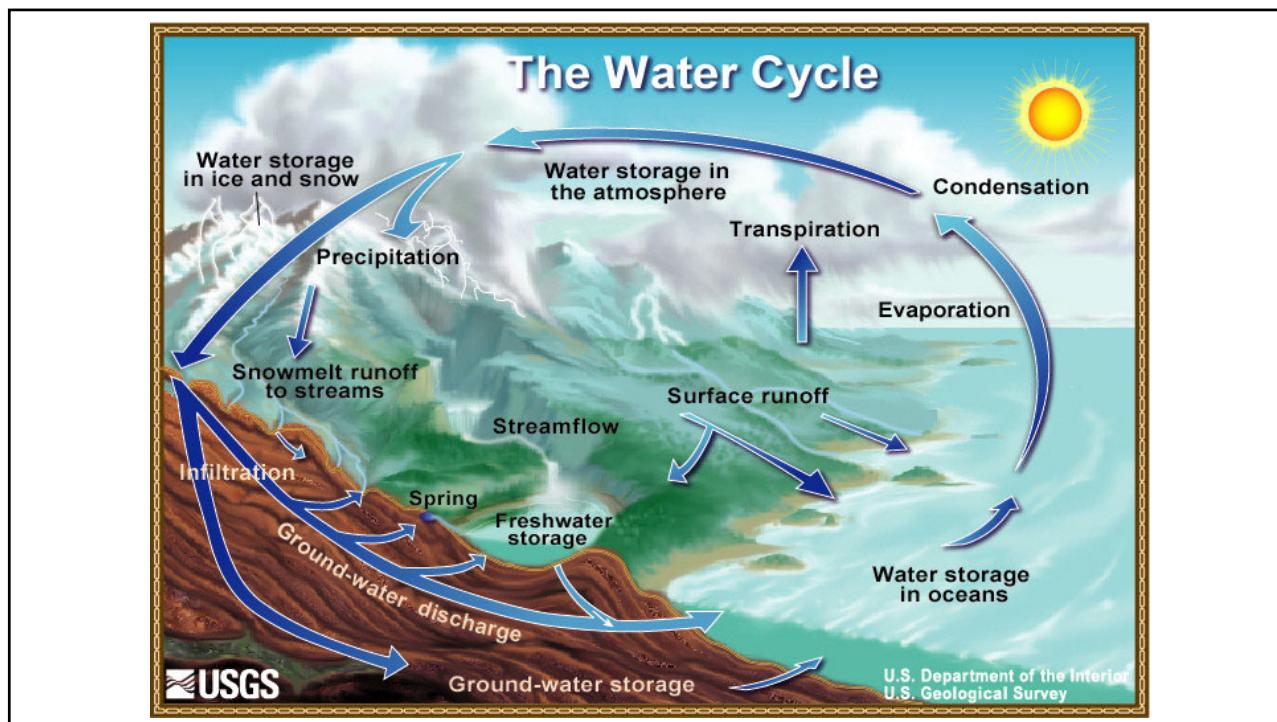
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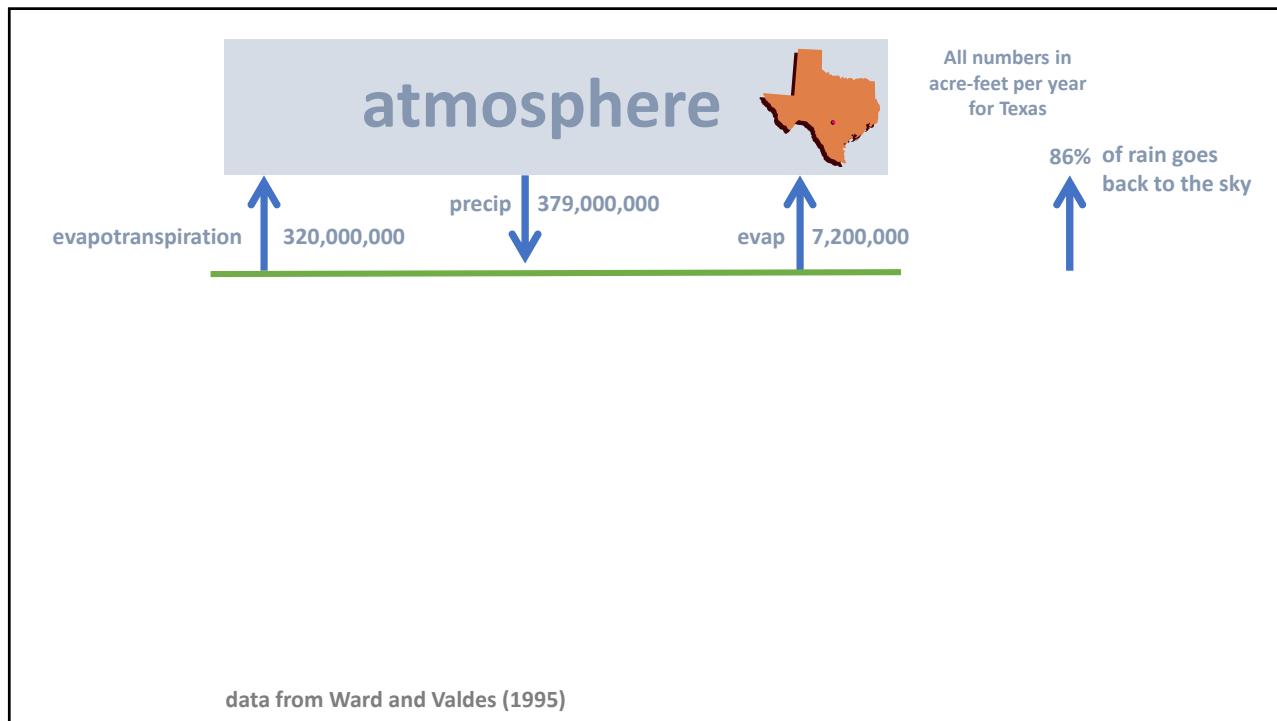


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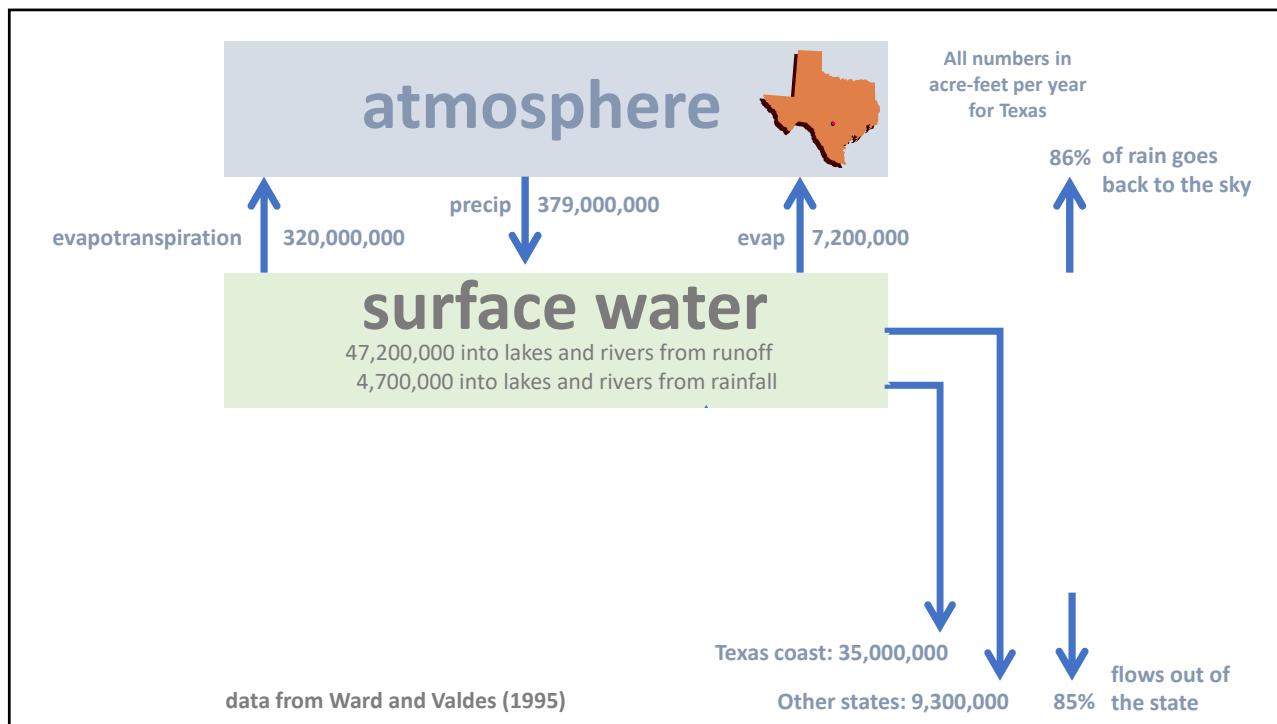
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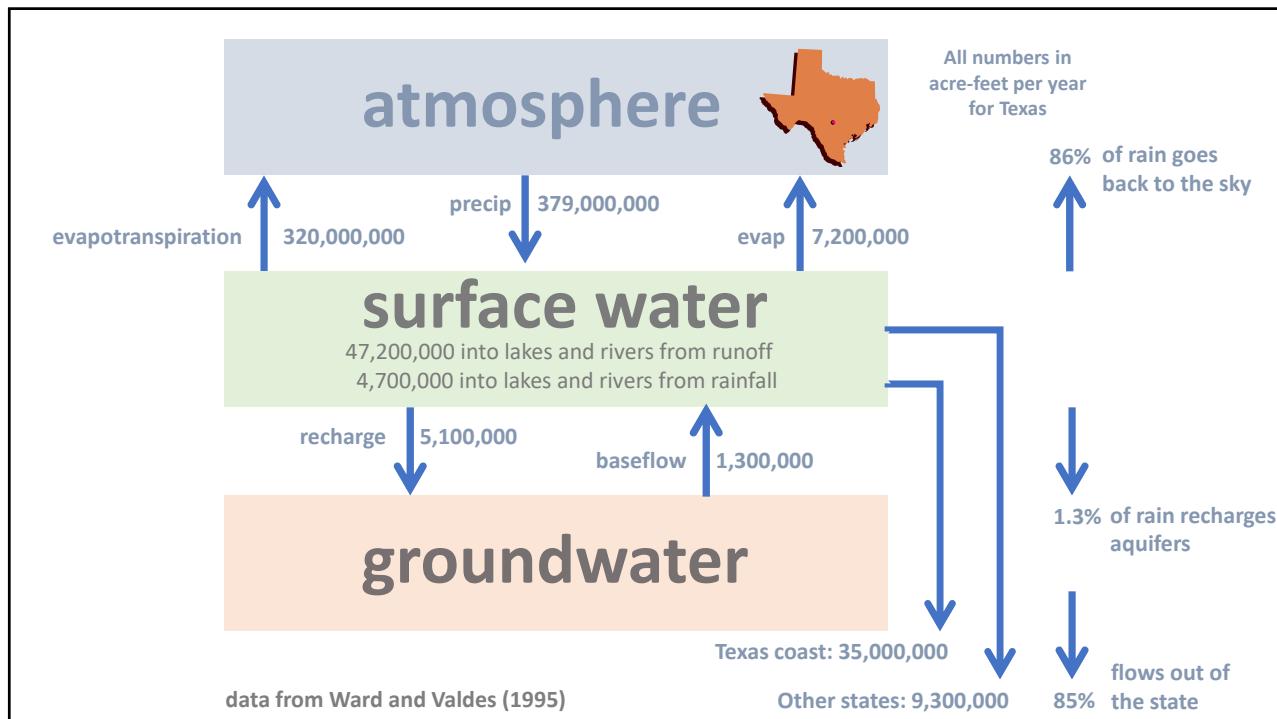
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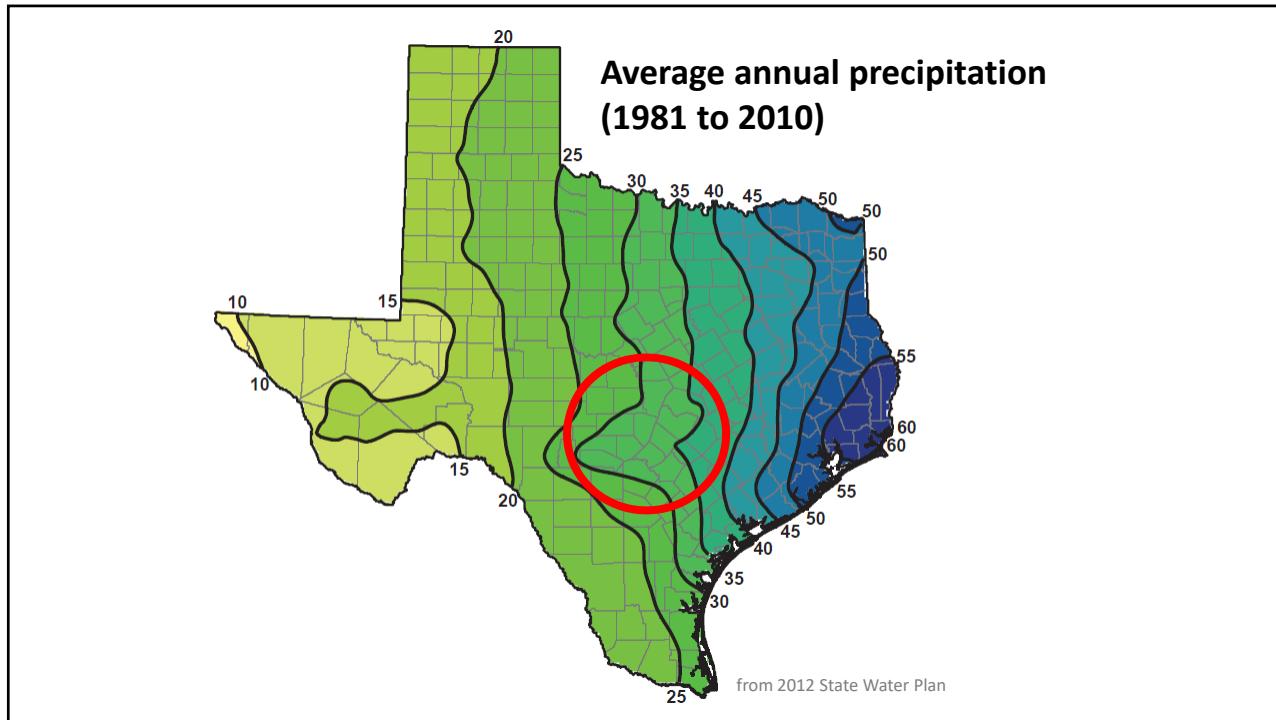
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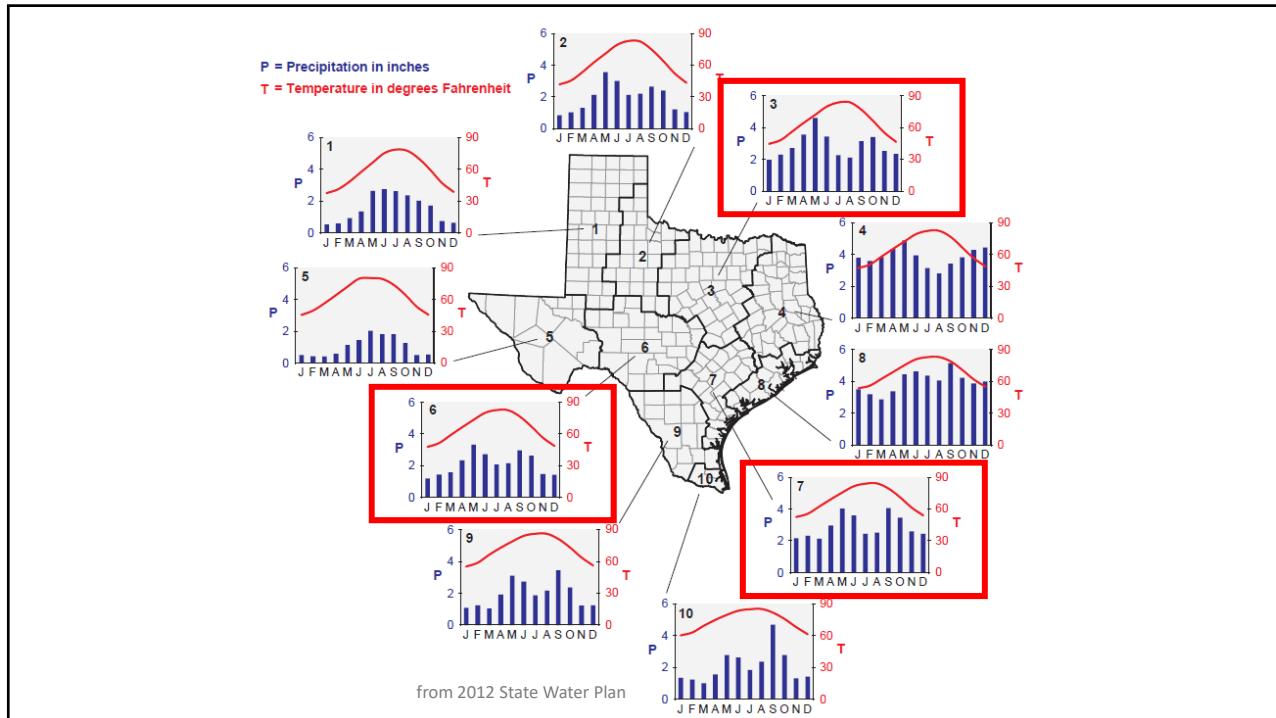
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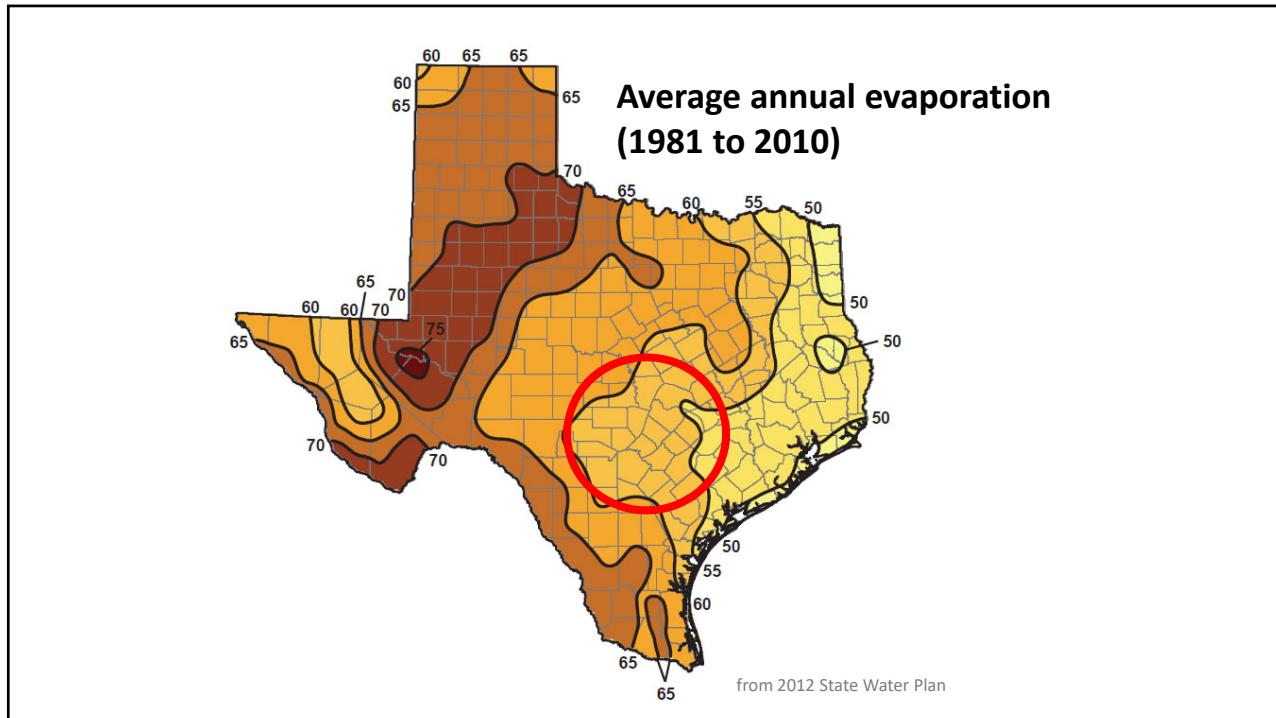
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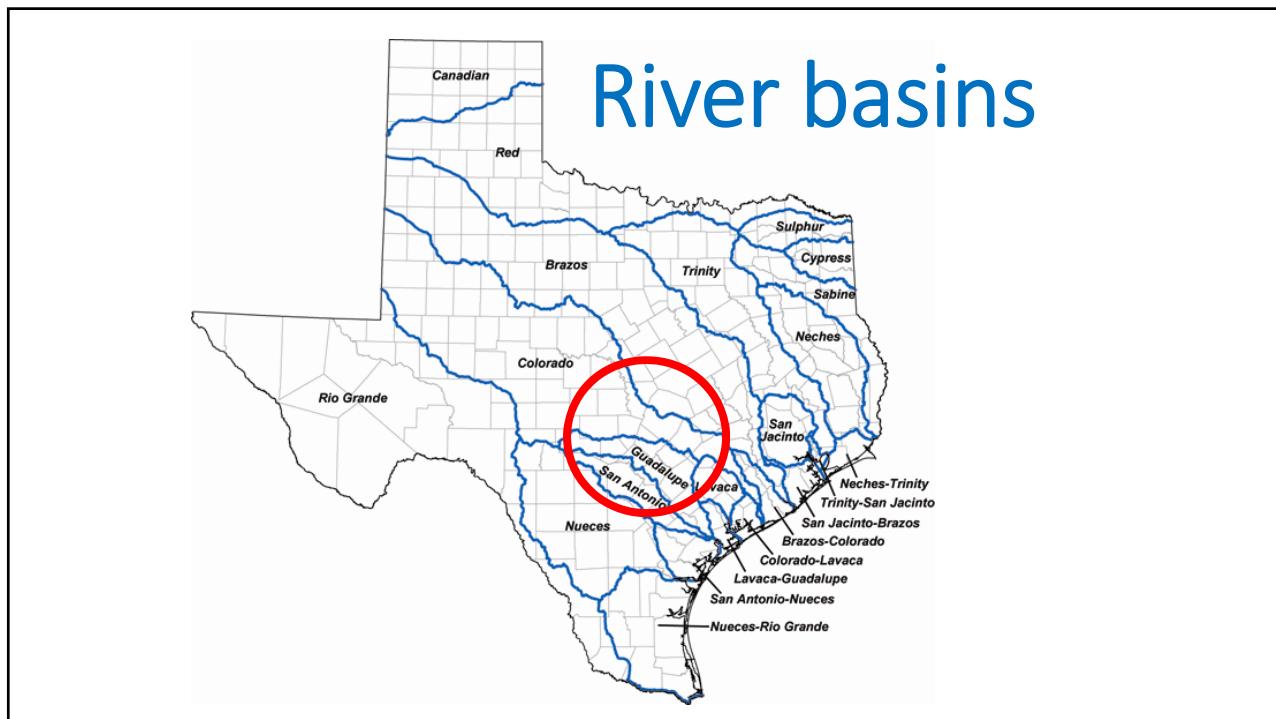
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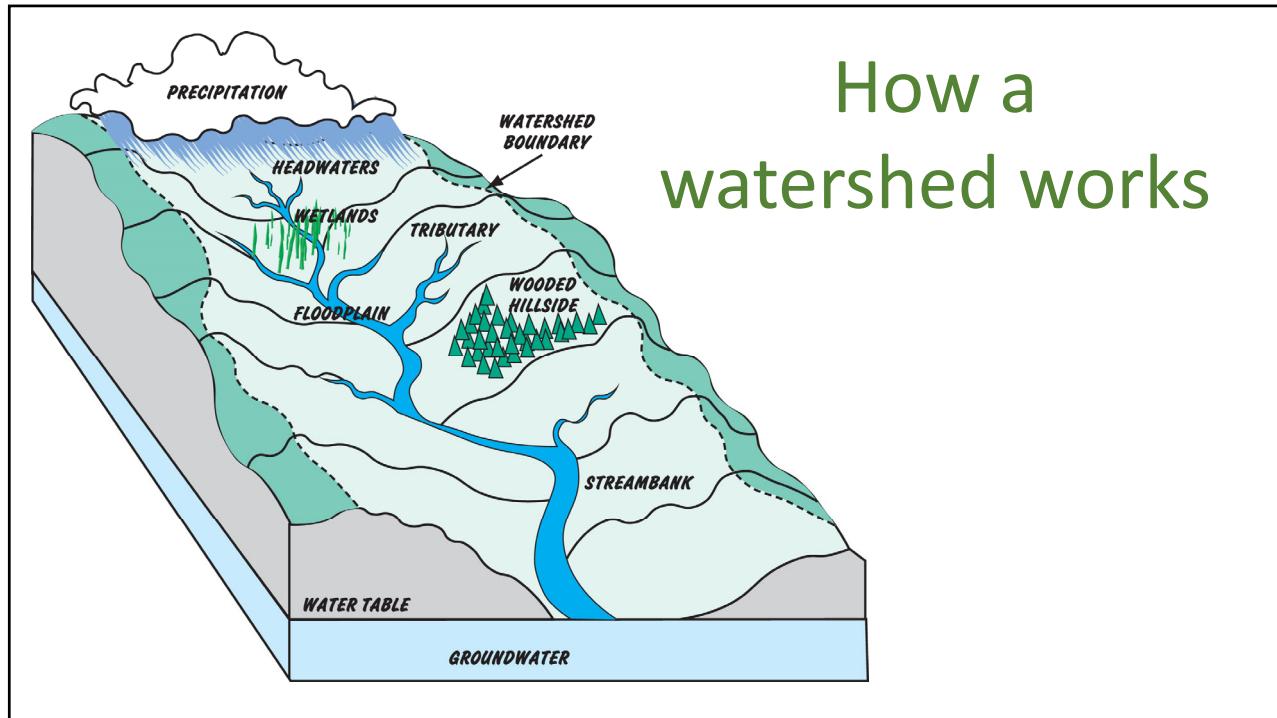
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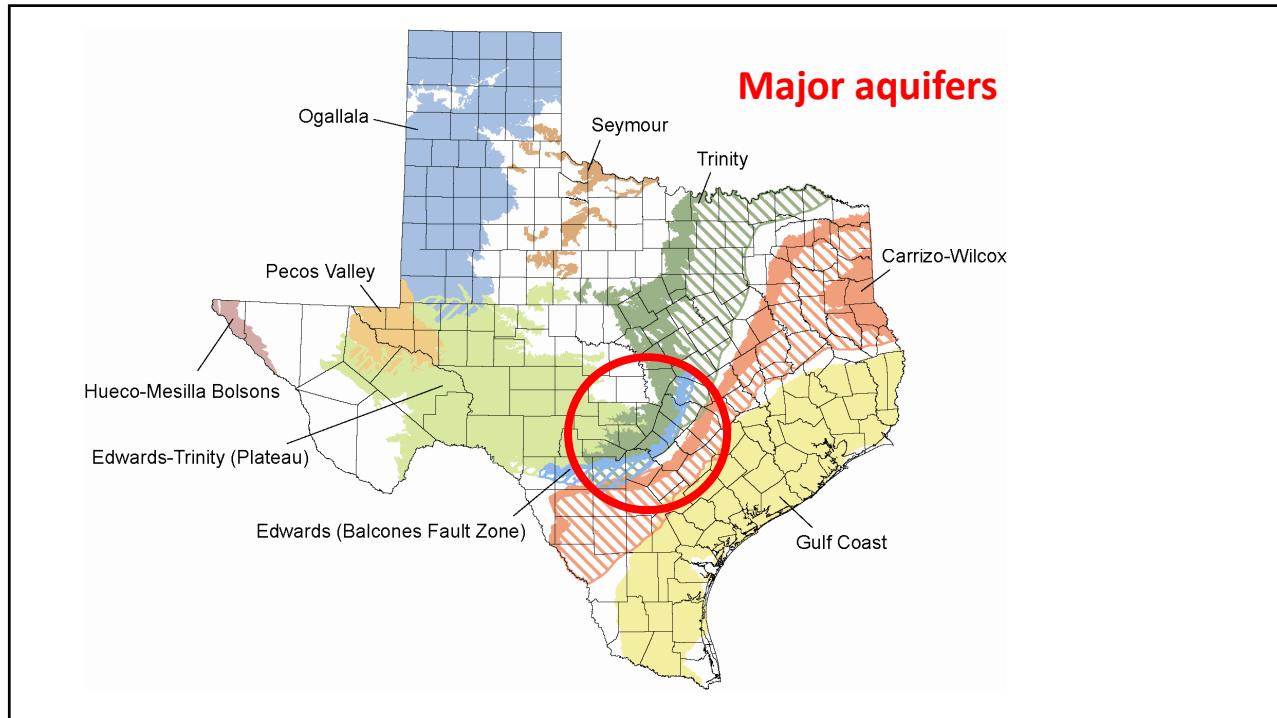


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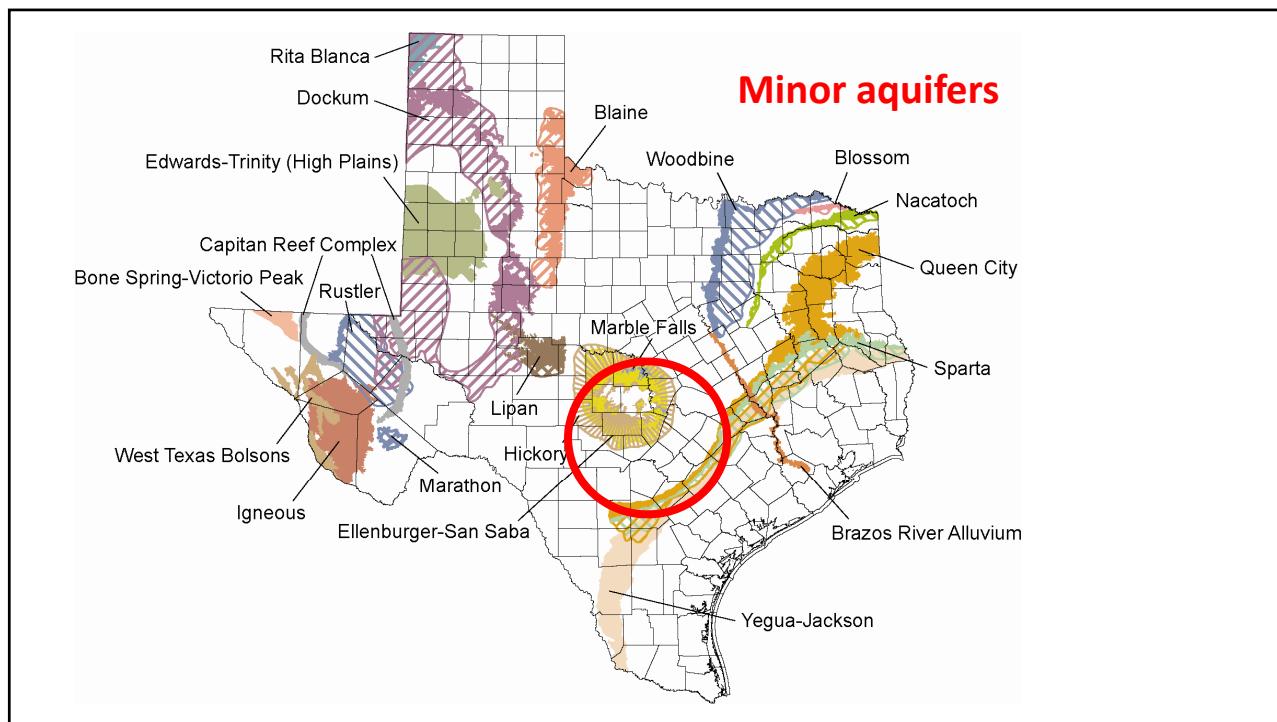


How a watershed works

13



14



15

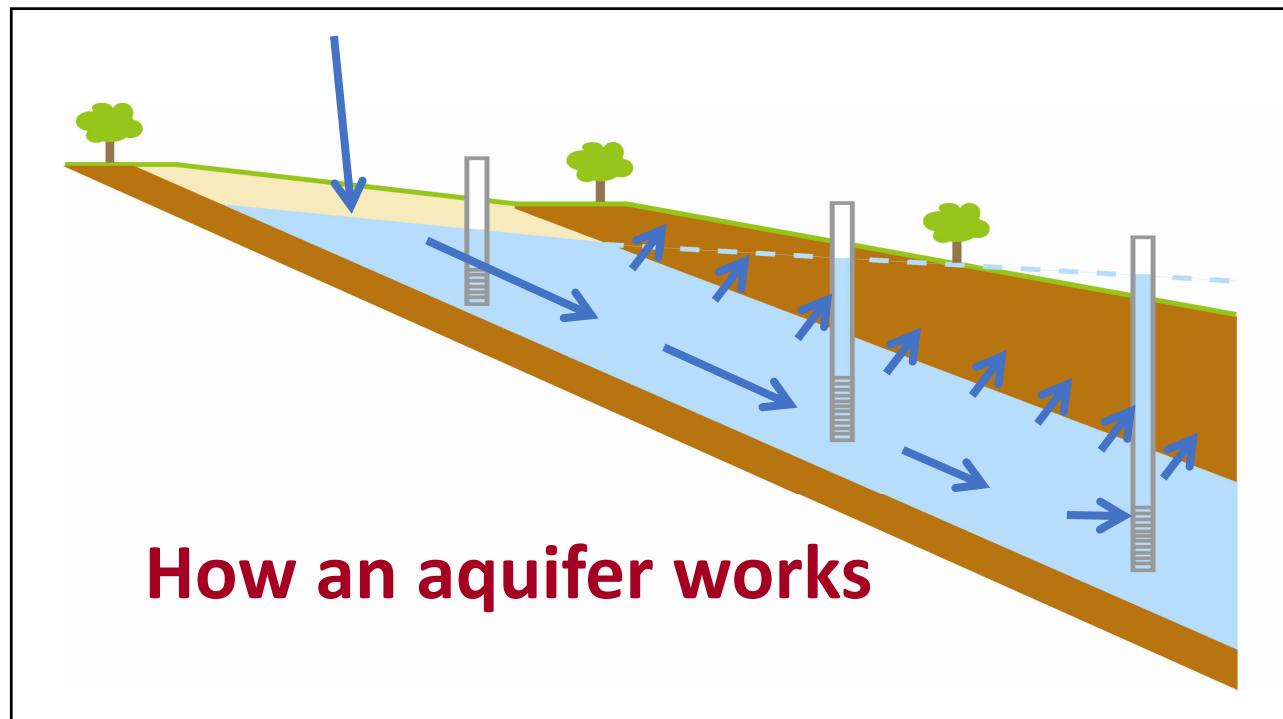


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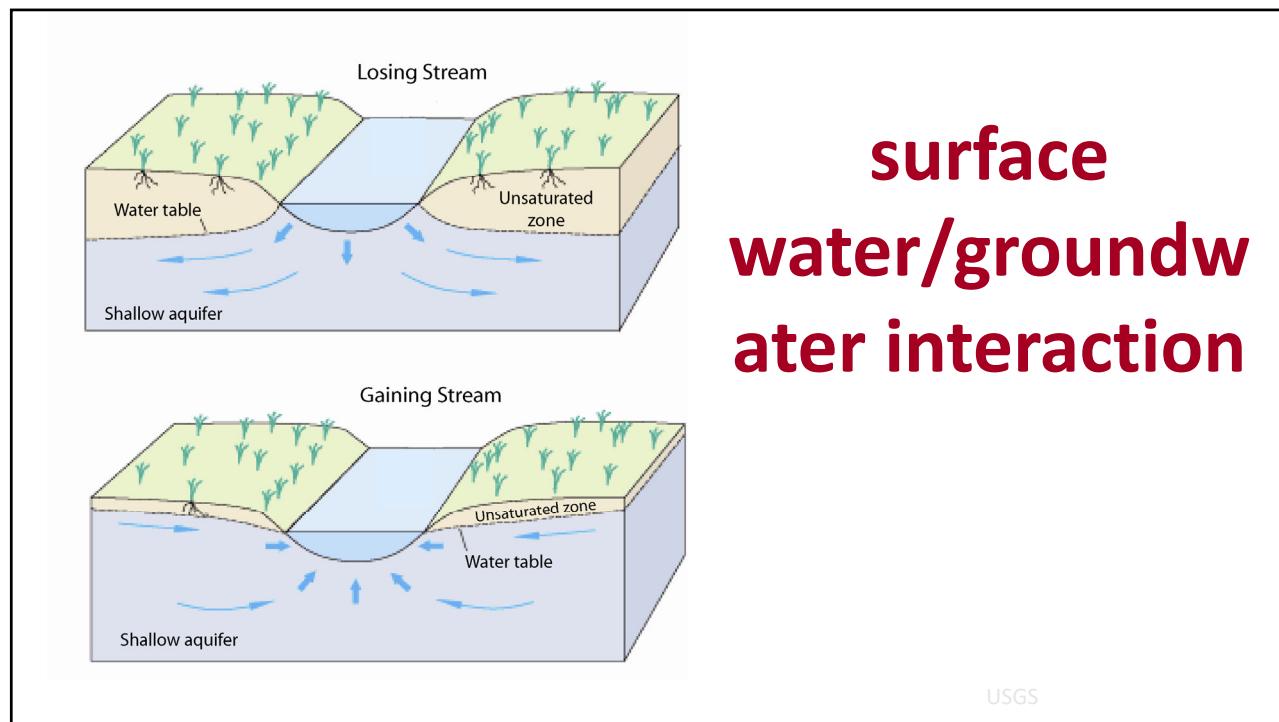


Edwards-Trinity (Plateau) Aquifer, limestone

17



18



19



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outline:

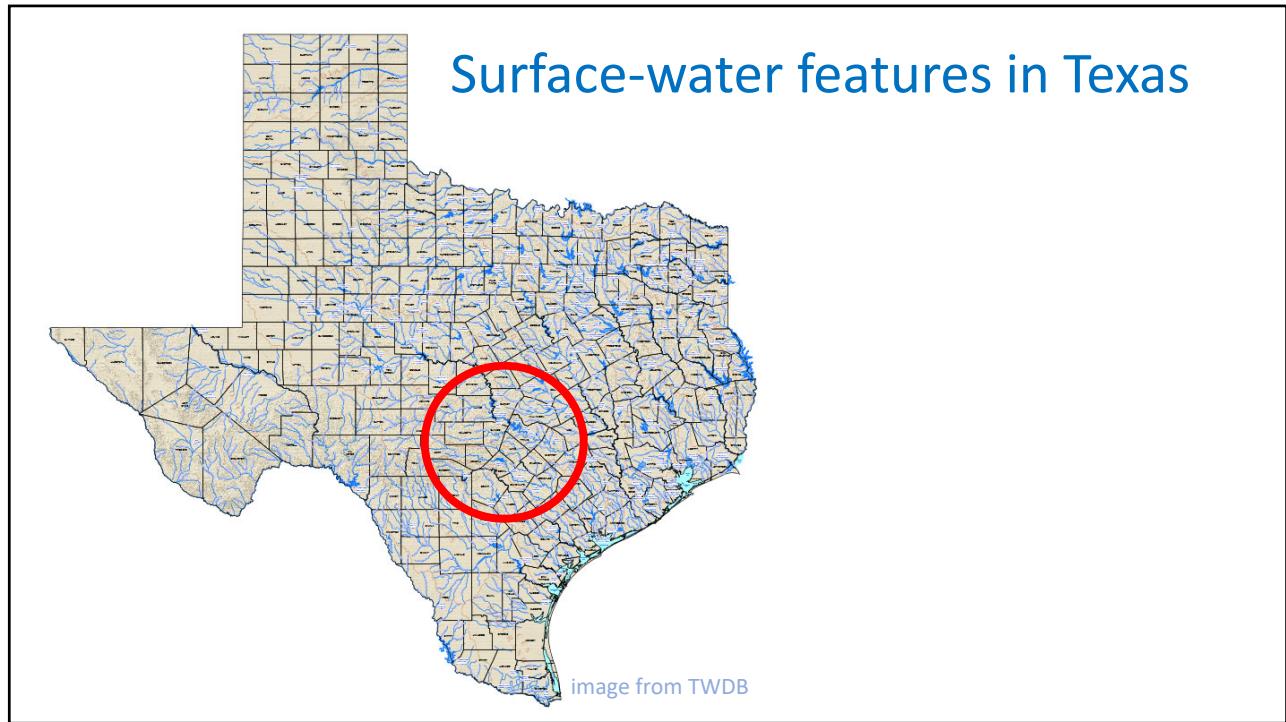


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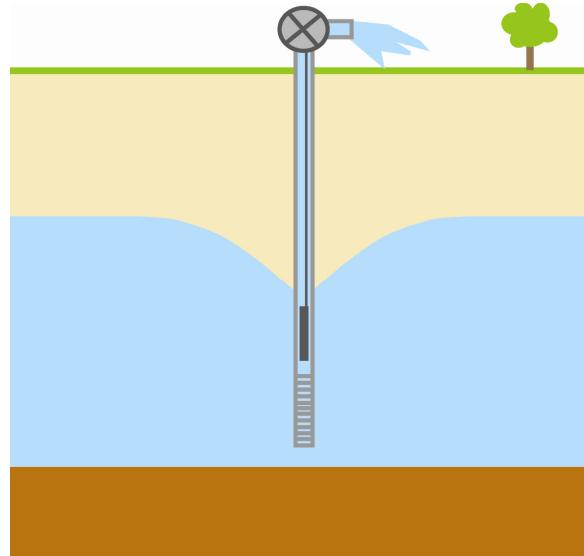


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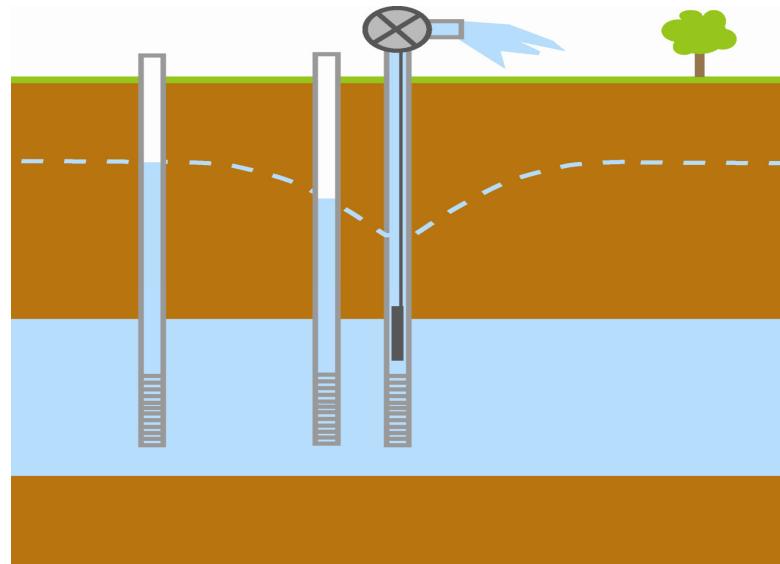
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pumping a well

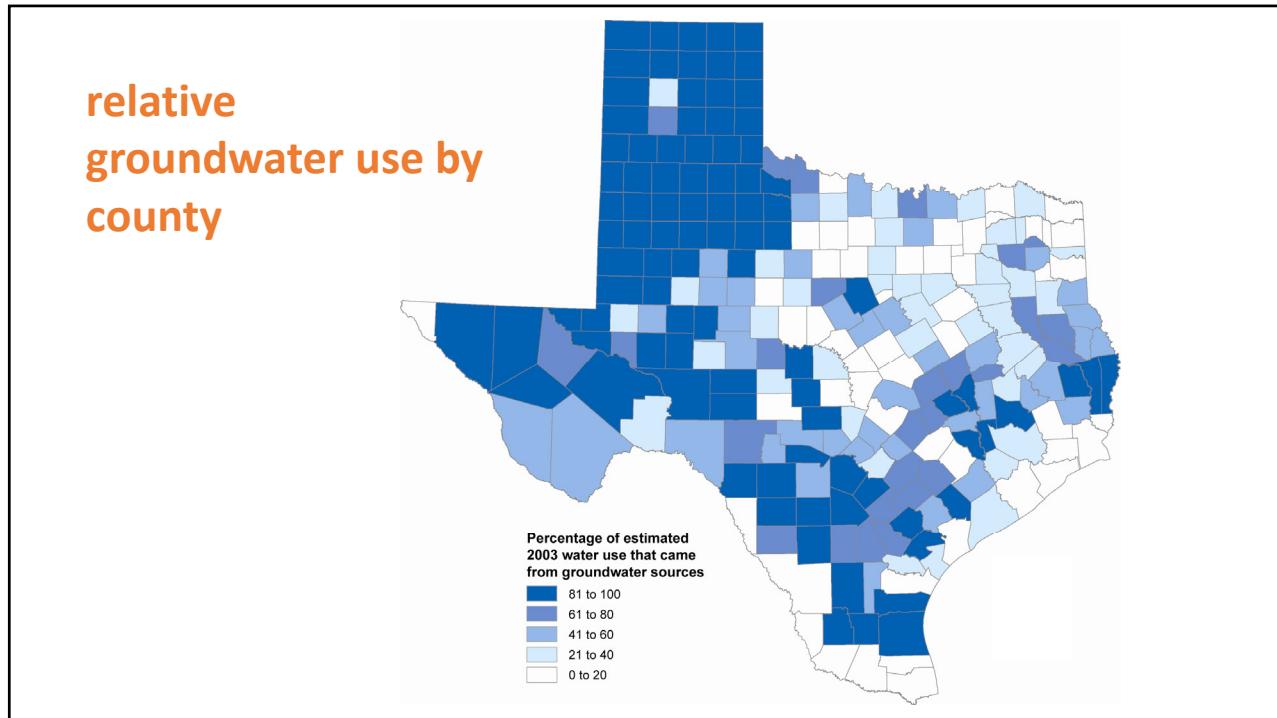


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pumping a well: confined



28



29



30



You own the rain!
and the overland flow!

31

Surface water is owned by the state.
Groundwater is owned by the landowner.

Both are subject to regulation.*

* Some argue that groundwater is now exempt from regulation.**

** But they're wrong.***

*** Probably...

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Discussing Water Rights, A Western Pastime

33

*Survey of the land surveys
by me J. W. Thompson
in 1853.*

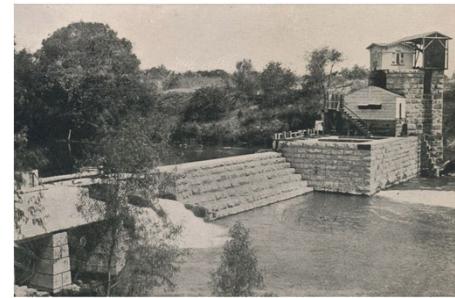
*J. W. Thompson
Samuel Brooks
John Davis Steph Cottle*

**Land surveys in Austin's Colony
along the Navidad River
and Brazos River**

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Surface Water

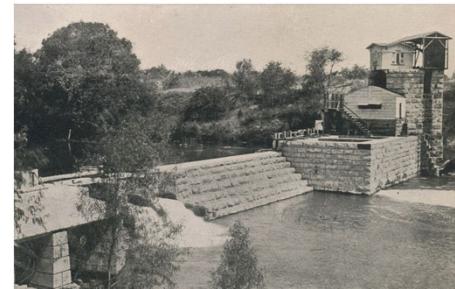
- Owned by the state
- Exempt uses:
 - Domestic and livestock
 - 200 acre-feet stock tanks
 - Wildlife management
 - Emergency use
 - Some others...



35

Surface Water

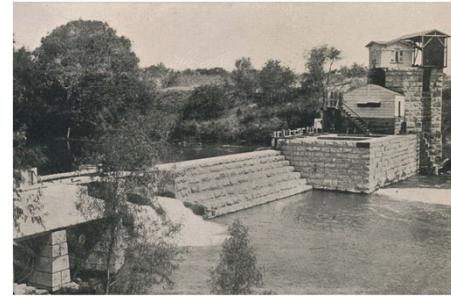
- Rights (in time)
 - Perpetual rights
 - Limited-term rights
 - Term permits
 - Temporary permits
- Rights (in place)
 - Impoundment right
 - Diversion (run-of-river) right
 - Diversion point
- Superior Rights
 - Limited riparian rights



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Surface Water

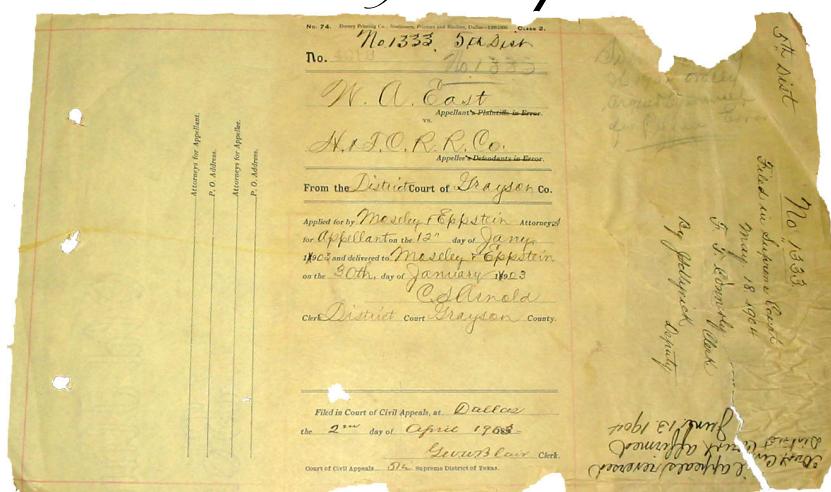
- Having a right doesn't mean you always have water!
- First in time = First in right
- TCEQ for permits
- Usufructable (you can sell your right!)



TCEQ = Texas Commission on Environmental Quality

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Rule of Capture 1904



...so secret, occult and concealed...

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Groundwater conservation districts **1949**



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Powers of a groundwater conservation district

In general, districts may:

- register wells
- regulate well spacing
- regulate pumping

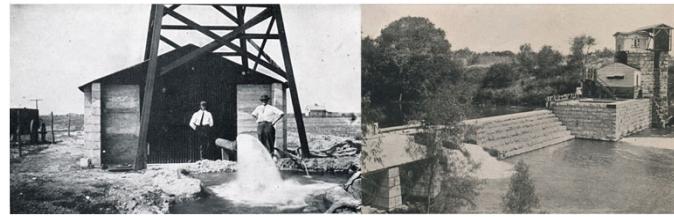
To know the powers:

- Chapter 36, Texas Water Code
- enabling legislation
- amendments to enabling legislation
- rules



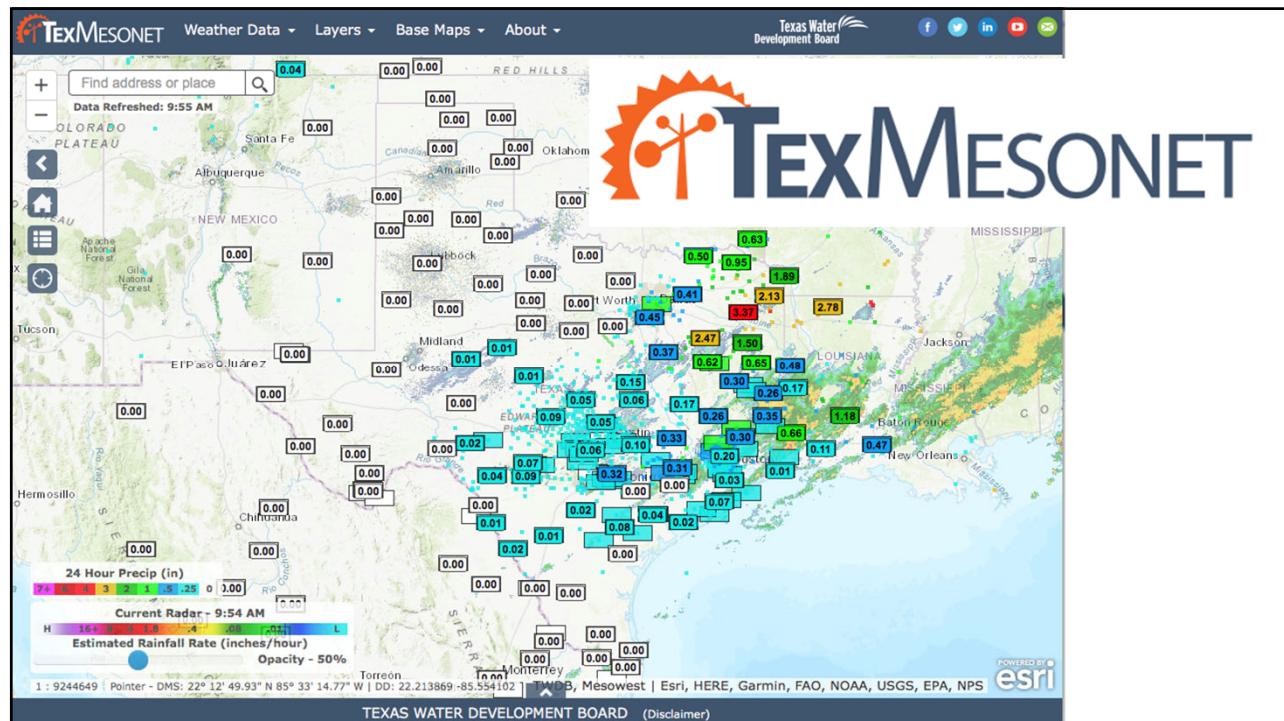
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outline:

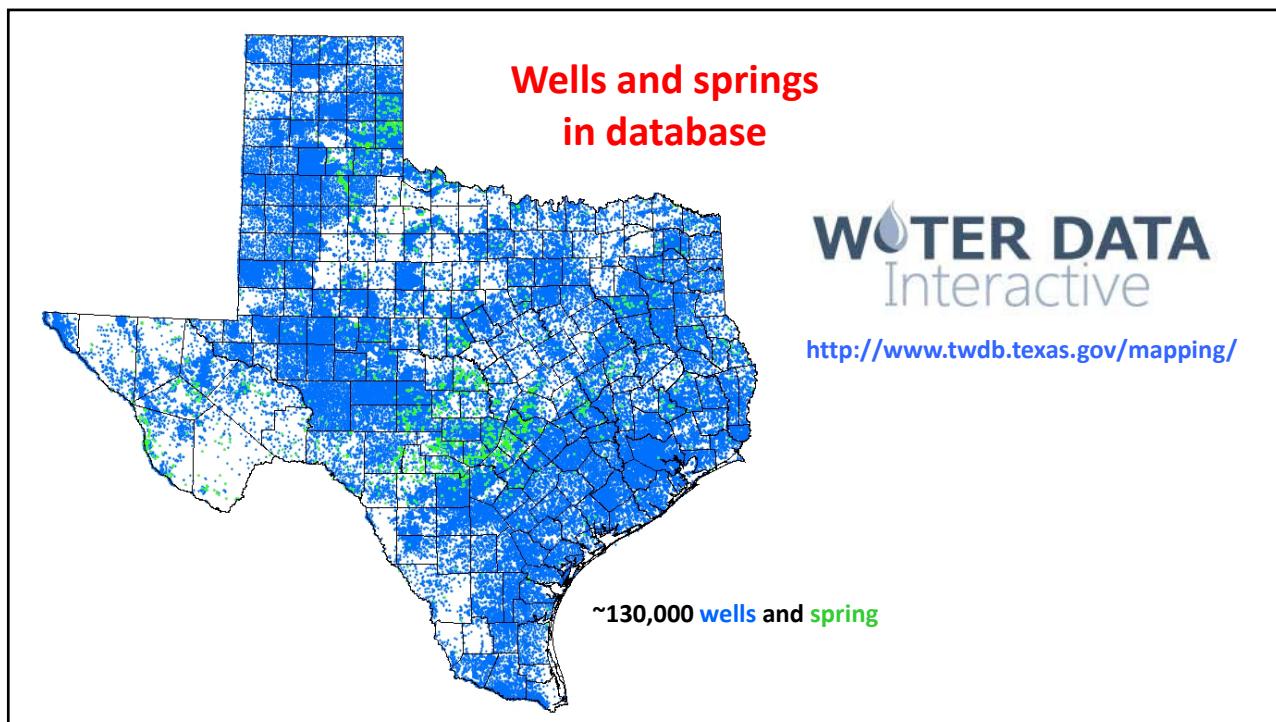


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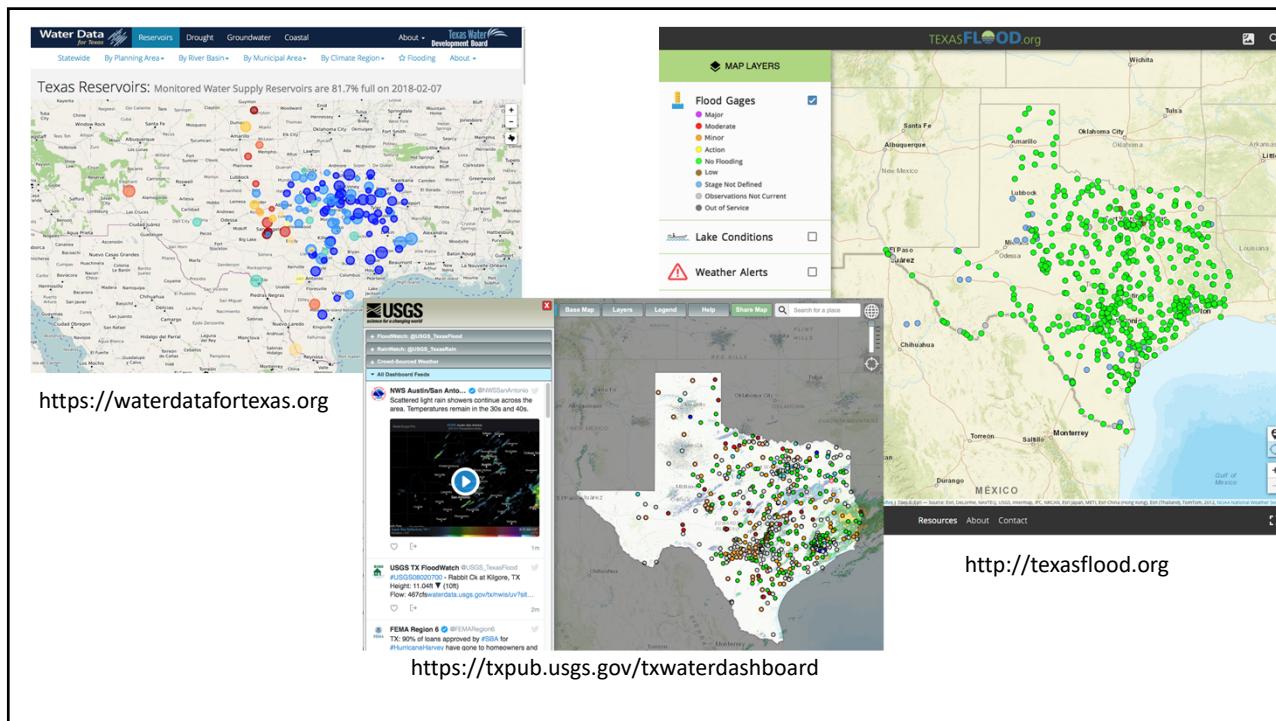
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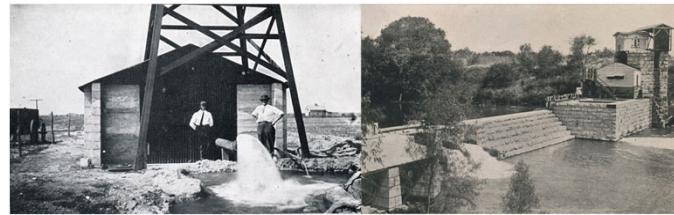


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**Groundwater and Surface Water
in Texas**

Robert E. Mace, Ph.D., P.G.
Meadows Center for Water and the Environment
Texas State University
(512) 245-6021
rem142@txstate.edu
[@MaceatMeadows](https://twitter.com/MaceatMeadows)

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