Groundwater Management in Texas

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Texas Water Development Board

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TPWD Texas Waters 2020 webinar series



Outline

Groundwater in Texas

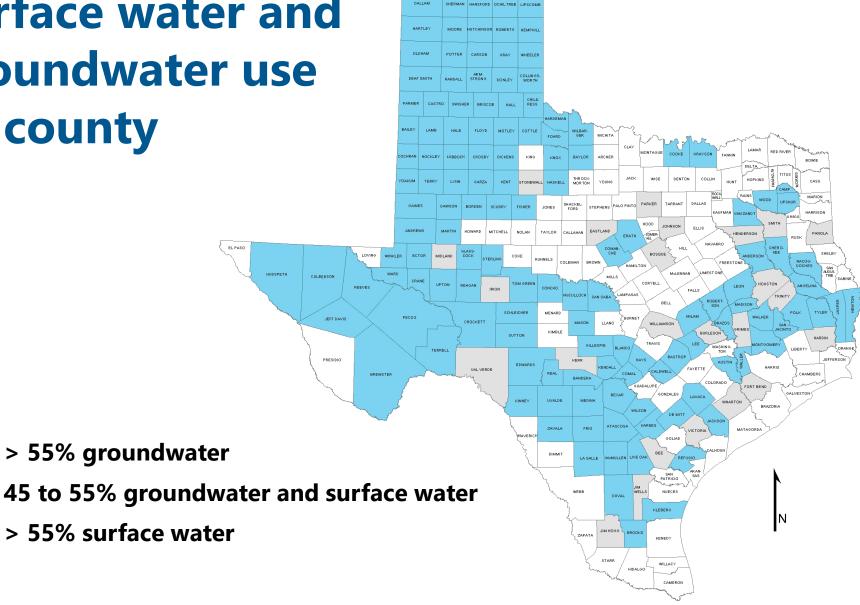
TWDB resources

Groundwater conservation districts

Groundwater planning

Hot Topics

Surface water and groundwater use by county





How many official aquifers are there in Texas?

A. 36

B. 31

C. 19

D. 25



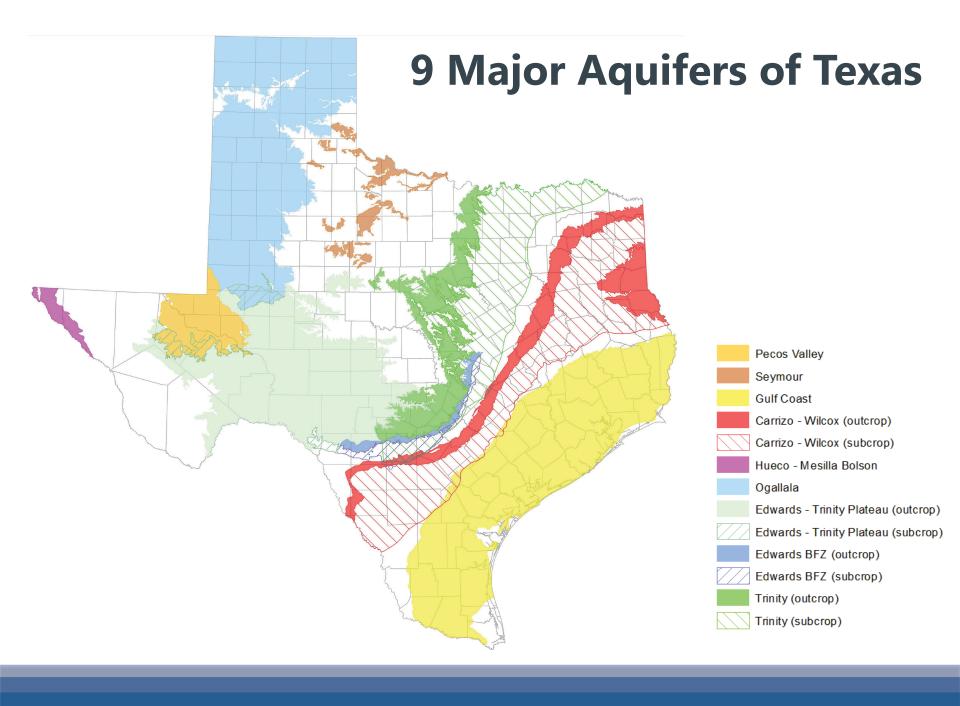
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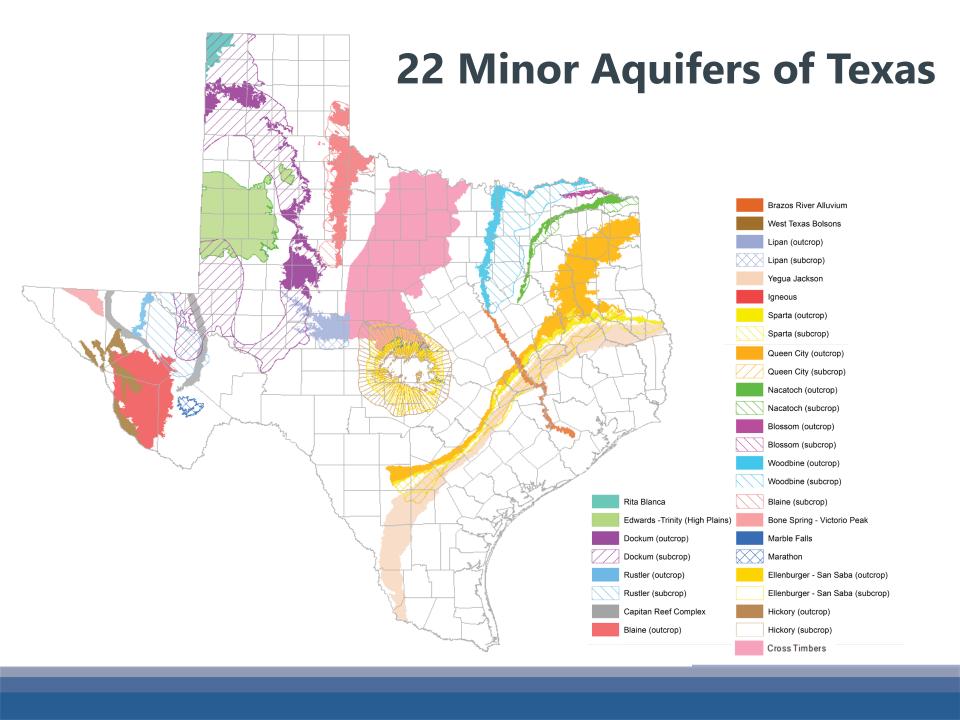
A. 36

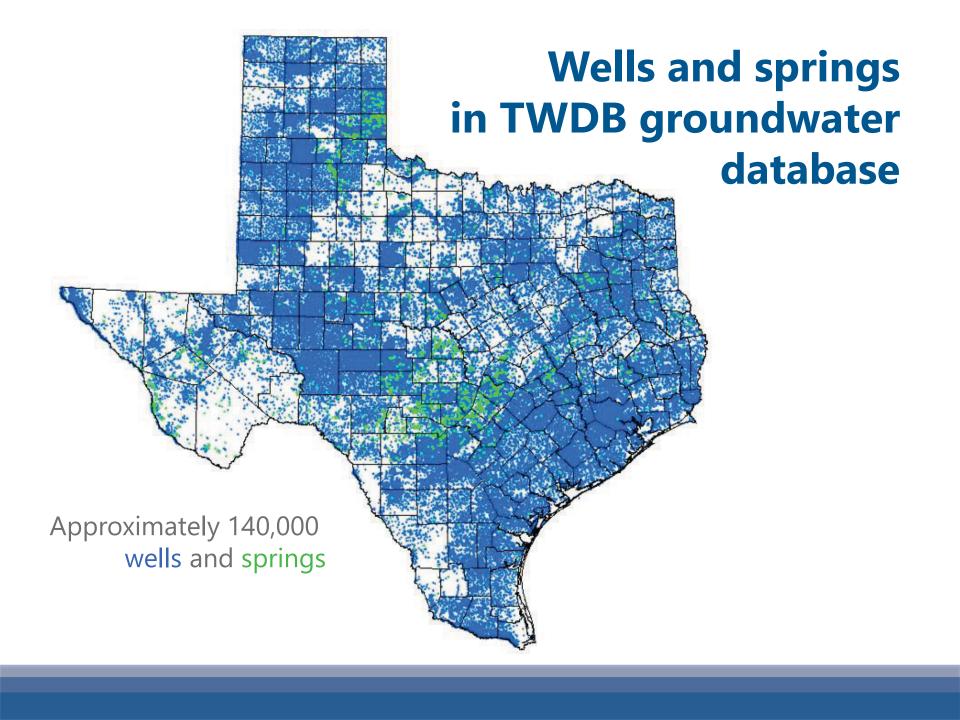
B. 31

C. 19

D. 25







Real-Time Recorder Wells

Groundwater



Reservoirs

Drought

Coasta

About **→**



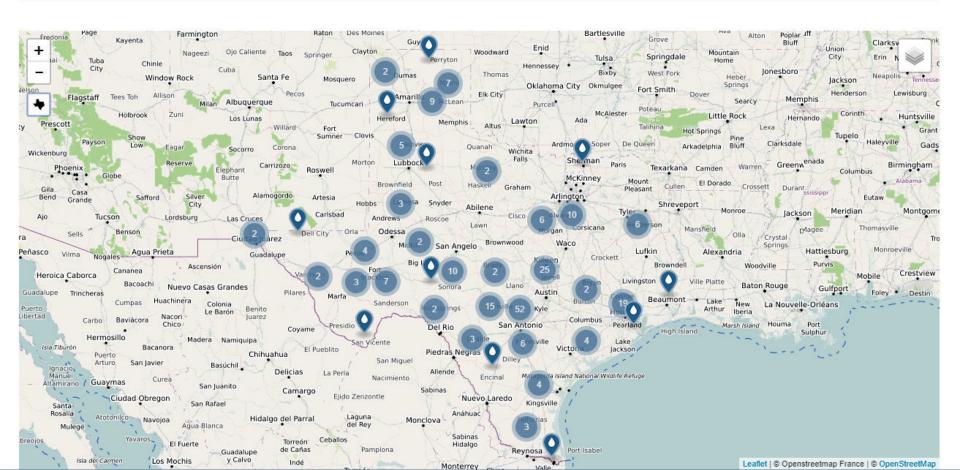
Statewide

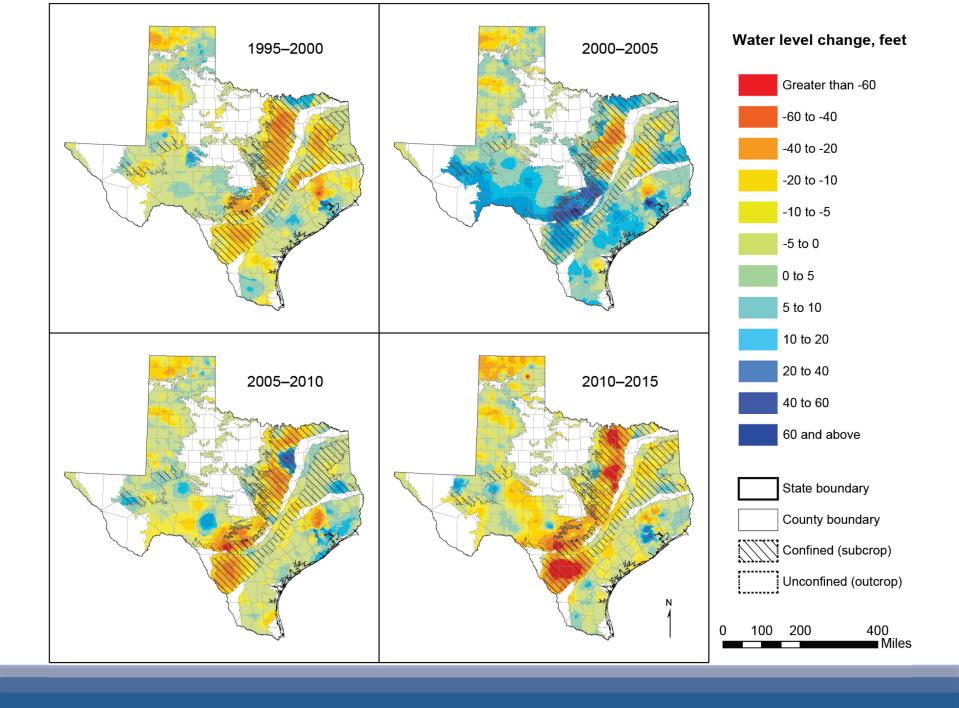
Download Data

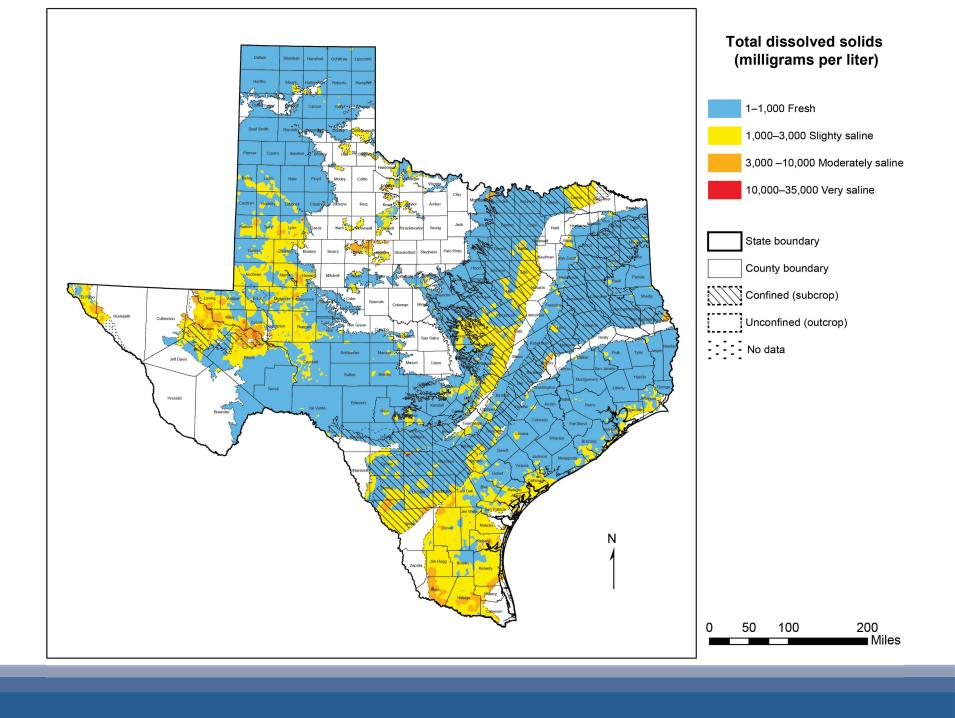
Frequently Asked Questions

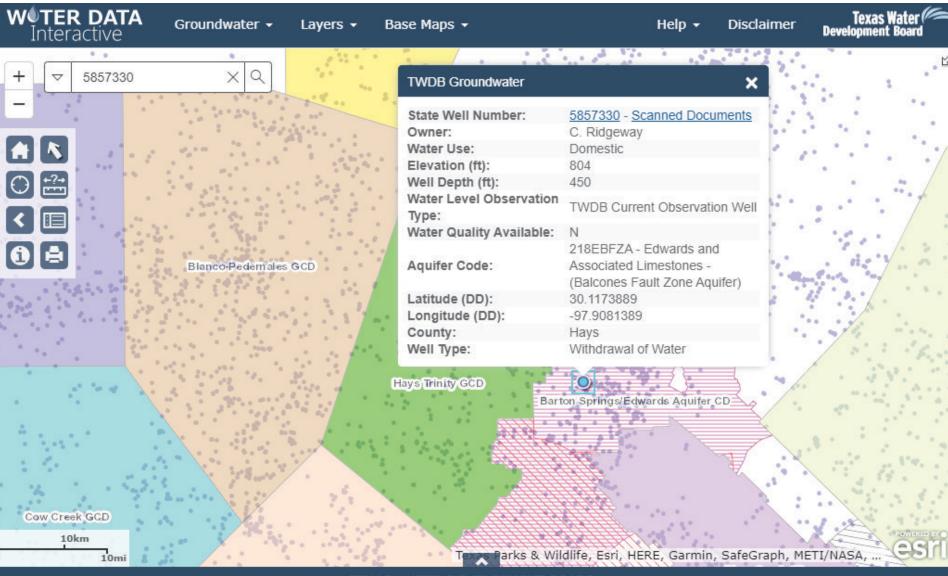
About

Automated Groundwater Level Wells









TEXAS WATER DEVELOPMENT BOARD

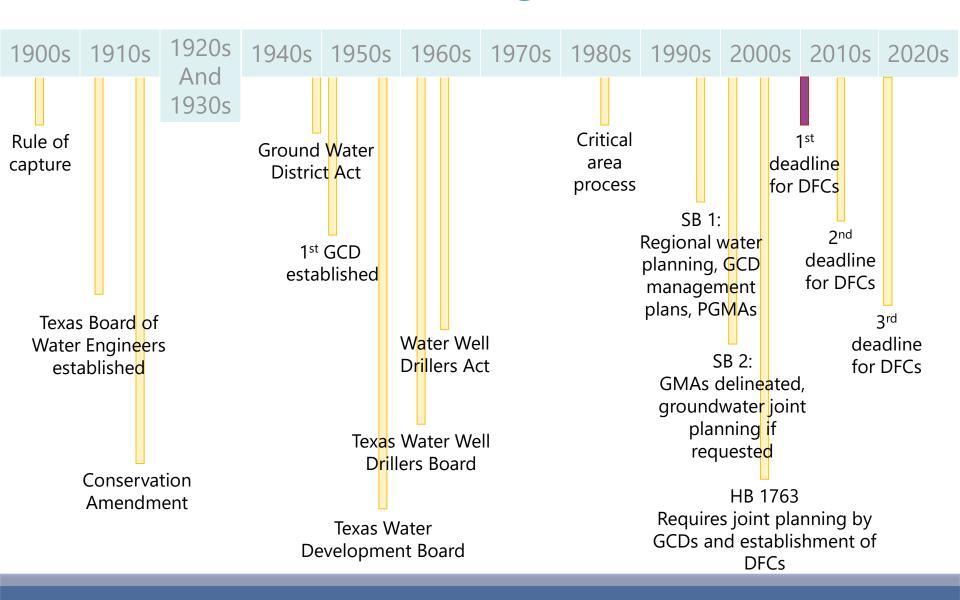
Groundwater Management



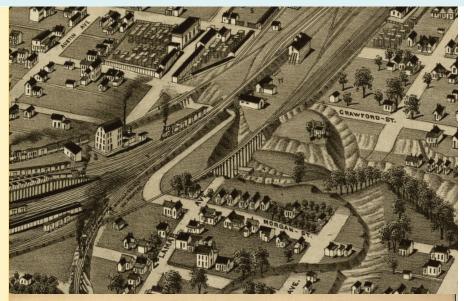
Rule of Capture

Local Control

Groundwater Management Timeline



1900s



1904



RULE OF CAPTURE

Established by the Texas Supreme Court

Houston & Texas Central Railroad Co. v. East

TEXAS BOARD OF WATER ENGINEERS

1913

Regulate appropriations of water

CONSERVATION AMENDMENT

(Texas Constitution Article XVI, Section 59)

1917

"The conservation and development of all of the natural resources of this State ... and the preservation and conservation of all such natural resources of the State are each and all hereby declared public rights and duties; and the Legislature shall pass all such laws as may be appropriate thereto."

UNDERGROUND WATER CONSERVATION DISTRICT ACT

Conserve, preserve, protect, recharge, and prevent waste of groundwater

FIRST UNDERGROUND WATER CONSERVATION DISTRICT

High Plains Underground Water Conservation District No. 1

1951

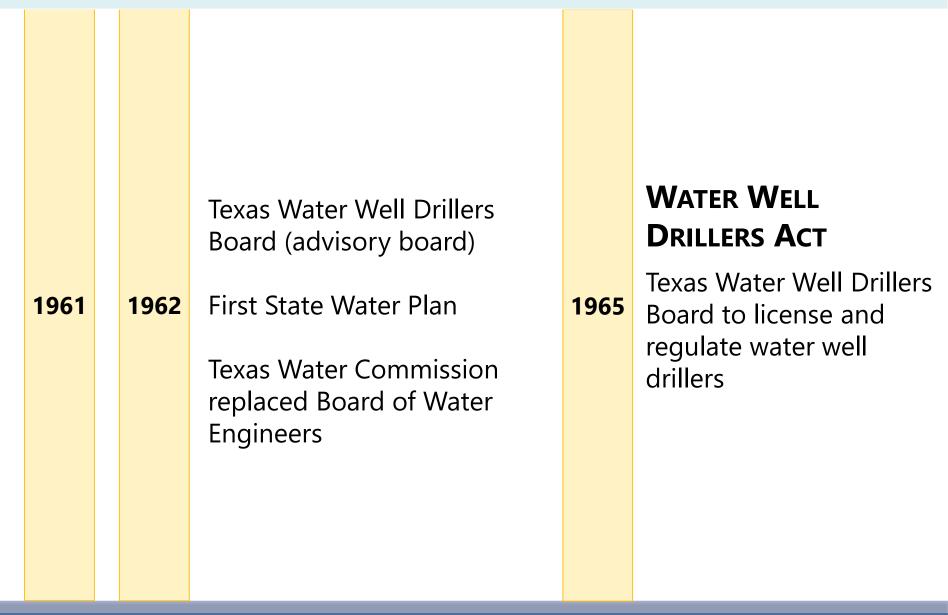
TEXAS WATER DEVELOPMENT BOARD

Financial assistance

1957

1949

1960s

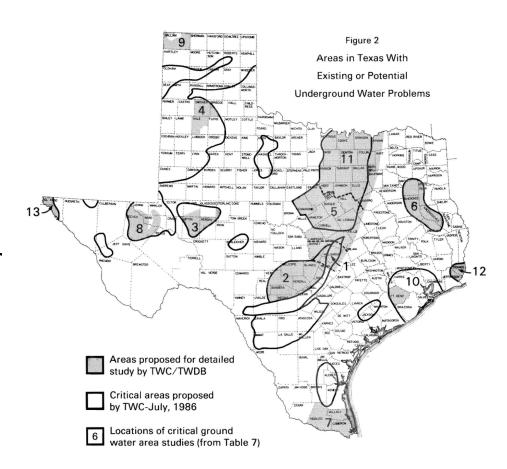


CRITICAL AREA PROCESS

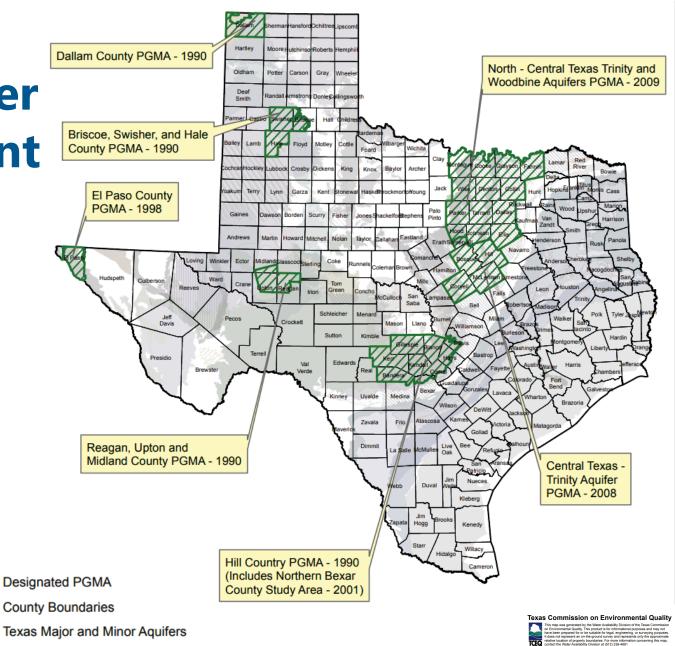
1985

Developed to identify critical groundwater problems over a 20 year period:

- Shortages
- Land subsidence
- Contamination



Priority
Groundwater
Management
Areas



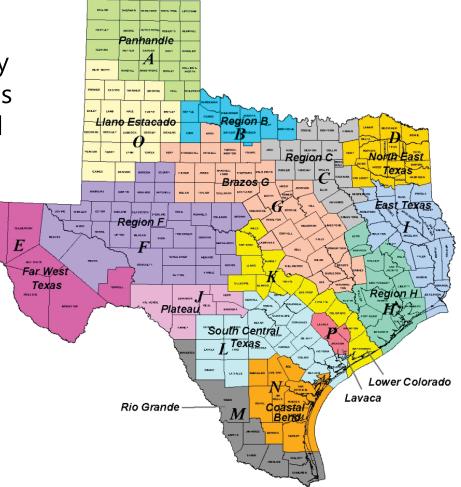
SENATE BILL 1

Critical Areas renamed to Priority Groundwater Management Areas (PGMAs), critical problem period increased to 25 years

1997 Regional Water Planning

Groundwater Conservation
Districts made State's preferred
method of groundwater
management

Districts required to submit management plans to TWDB



Groundwater Conservation **Districts** (GCDs)



When was the first GCD created?

A. 1954

B. 1950

C. 1951

D. 1953



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High Plains Underground Water Conservation District No. 1

Groundwater Conservation Districts

- Preferred method of groundwater management
- Authority to regulate well spacing and/or production
- Managed by board members and general manager
- Funded by taxes and/or fees
- TWDB GCD loan program available to get started

GCDs can be created...

- by the Texas Legislature
- by landowner petition to the Texas Commission on Environmental Quality (TCEQ)
- by landowner petition to join an existing district
- by TCEQ for a Priority Groundwater Management Area

required duties

- develop and adopt a groundwater management plan
- adopt rules to implement the management plan
- require permits for drilling, equipping, or completing wells that produce more than 25,000 gallons per day
- make information available to TWDB & TCEQ
- meet quarterly

Management Plans

Required data components provided by the TWDB

Modeled available groundwater

Amount of groundwater being used on an annual basis

Water budget of groundwater resources (recharge from precipitation, discharge to springs and surface water, flow in and out of the district)

Projected surface water supply within the district

Projected total demand for water in the district

Consideration of water supply needs and water management strategies

Management Plans

Required goals, as applicable

Providing the most efficient use of groundwater

Controlling and preventing waste of groundwater

Addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control

Addressing conjunctive surface water management

Addressing natural resource issues

Controlling and preventing subsidence

Addressing desired future conditions adopted by the district

Rules to implement management plans

May set rules to:

- Limit groundwater production based on tract size or well spacing
- Provide for conserving, preserving, protecting, and recharging groundwater
- Prevent degradation of water quality
- Control subsidence
- Prevent waste

Well permitting

- Required for drilling, equipping, operating, or completing wells
- Required for altering the size of wells or pumps
- May require a permit amendment if there is a change in use

Permitting exemptions

- Domestic, livestock, and poultry
 - on a tract of land larger than 10 acres, and
 - unable to produce more than 25,000 gallons per day
- Oil and Gas
 - Drilling
 - Exploration
- Mining
- Statutory exemptions in enabling legislation
- District exemptions in rules

Authority to set fees

Administrative fees

- filing applications
- out of district services

Production fees (shall not exceed):

- \$1 per acre-foot for agricultural use
- \$10 per acre-foot for any other use
- transportation fee

optional duties

- adopt rules to conserve, preserve, protect, recharge, and prevent waste of groundwater
- provide for the spacing of water wells
- regulate production
- carry out research projects
- require permits for groundwater transfers
- require an owner to cap/close open well

what districts can't do

- Adopt policy without public process
- Completely prohibit export of groundwater
- Levy taxes without electoral approval
- Apply excessive fees



What is the State's preferred method of groundwater management?

- A. Groundwater conservation districts
- B. Rule of Capture
- C. Priority Groundwater Management Areas
- D. State-level management



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SENATE BILL 2

- Groundwater management areas to be delineated by TWDB
- GCDs conduct groundwater joint planning if requested
- TCEQ to recommend GCD creation in PGMAs

*Texas Well Record Submission and Retrieval system

House Bill 1763

 Groundwater joint planning required by GCDs

2005

Requires the establishment of desired future conditions

2001

Joint Planning within Groundwater Management **Areas**

Joint Planning within Groundwater Management **Areas**

The Groundwater Availability **Equation**



Desired Future Conditions Groundwater availability models & other tools

Modeled Available Groundwater

Desired future conditions (DFCs)

- Broad policy goal
- Quantitative description of the desired condition of groundwater resources in a management area at one or more specified times in the future
- Updated at least every 5 years
- Used to determine future groundwater availability

Desired future conditions (DFCs)

- Drawdown, springflow, storage volume
- For relevant aquifers
- May be established for:
 - Aquifer
 - Aquifer subdivision
 - Geologic strata
 - Geographic area

2010s

20103				
2010	2011	September 1, 2010 deadline to establish first round of DFCs 2011 Legislative changes to the groundwater joint planning process PGMA critical problem period increased to 50 years	2016	Second round of proposed desired future conditions due by May 1, 2016

2020s

Third round of proposed desired future conditions due May 1, 2021

2021 2022

Adopt third round of desired future conditions by January 5, 2022

Modeled Available Groundwater (MAG)

- Amount of water that may be produced on an average annual basis to achieve a desired future condition
- Groundwater availability
- Calculated by TWDB



GCDs

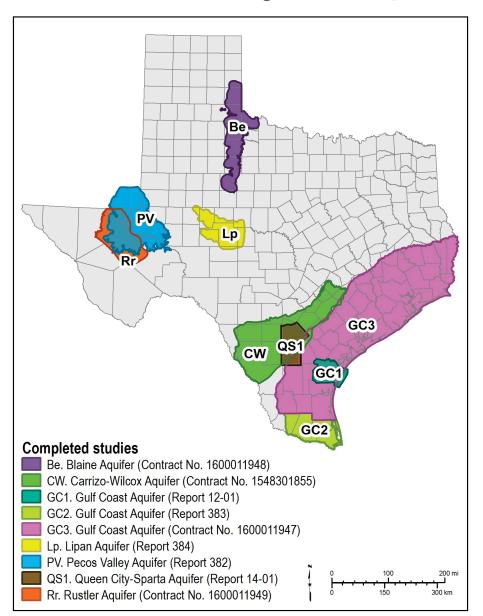
Use in management plans and consider in permitting

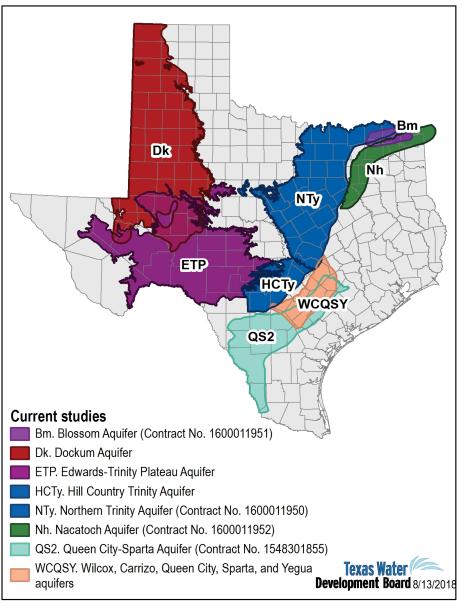
RWPGs

Use as groundwater availability for Regional Water Plans

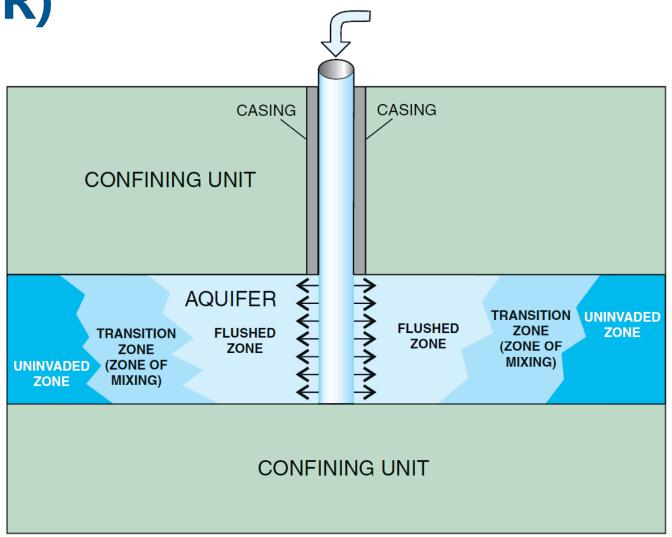
Hot Topics

Brackish Resources Aquifer Characterization System (BRACS) Program





Aquifer Storage and Recovery (ASR)



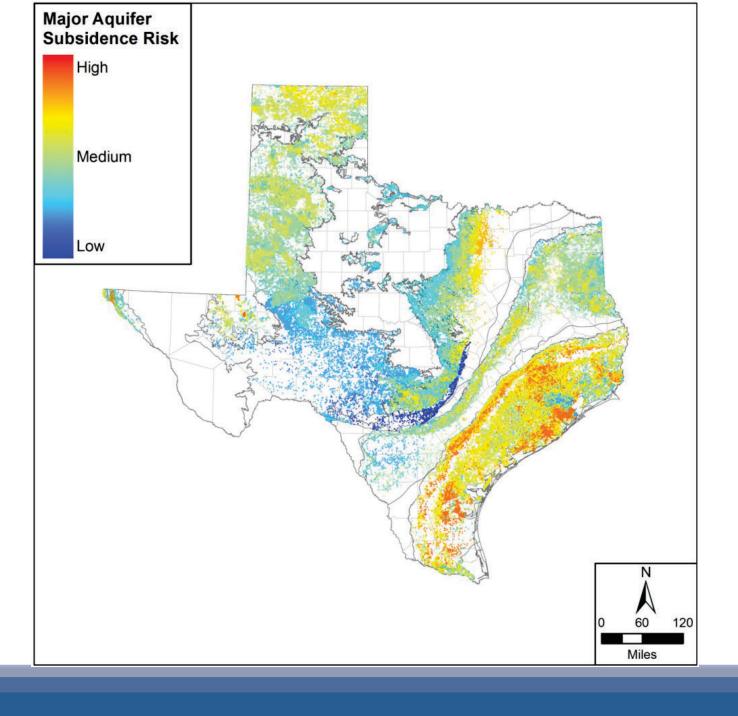
Subsidence



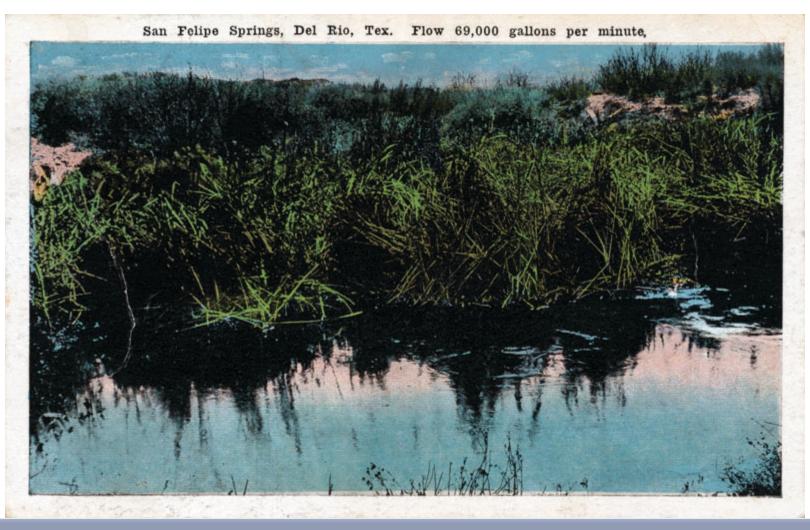


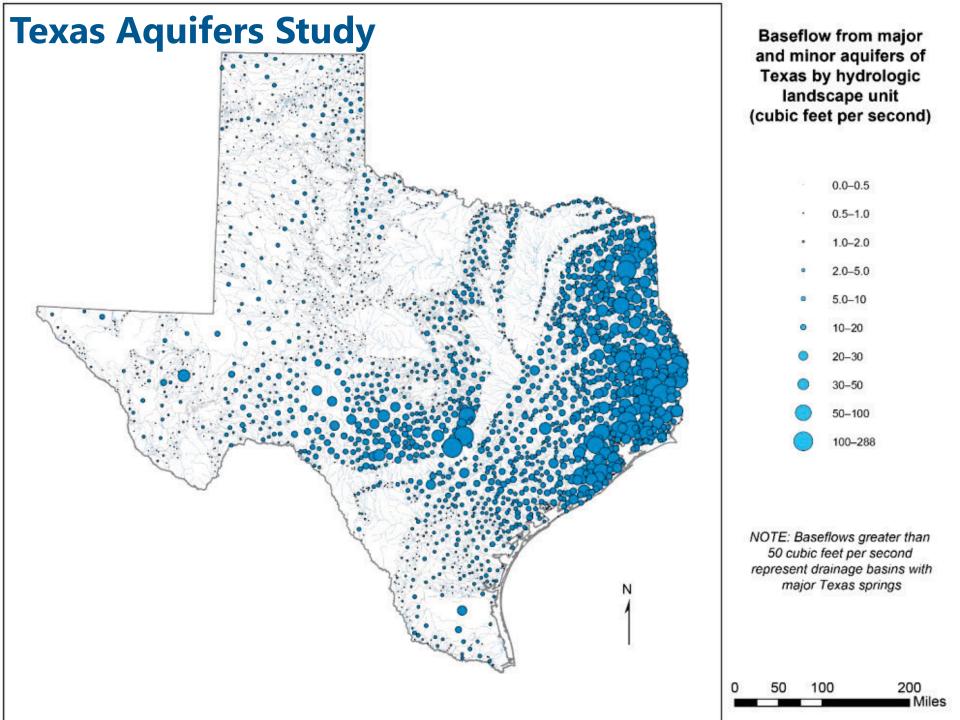
Google Earth

https://hgsubsidence.org/

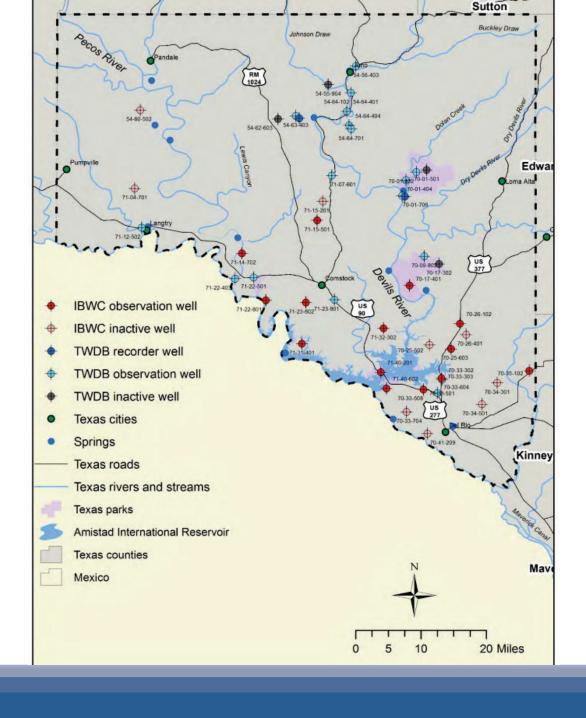


Groundwater-Surface Water Interaction





Groundwater conditions in Val Verde County





Do you know if you live in a groundwater conservation district and how you can get involved?

A. Yes

B. No



www.twdb.texas.gov/groundwater

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