

Groundwater Conservation Districts In Texas

Brazos Center
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Tonight:

- Groundwater Resources
- Water Supply and Demand Projects
- Overview of Texas Water Law
- Powers and Responsibilities of Districts
- Financing of Districts
- Questions.....

Managing Texas' Groundwater Resources

- Texas has extensive groundwater resources
- About 60% of total freshwater use is from groundwater

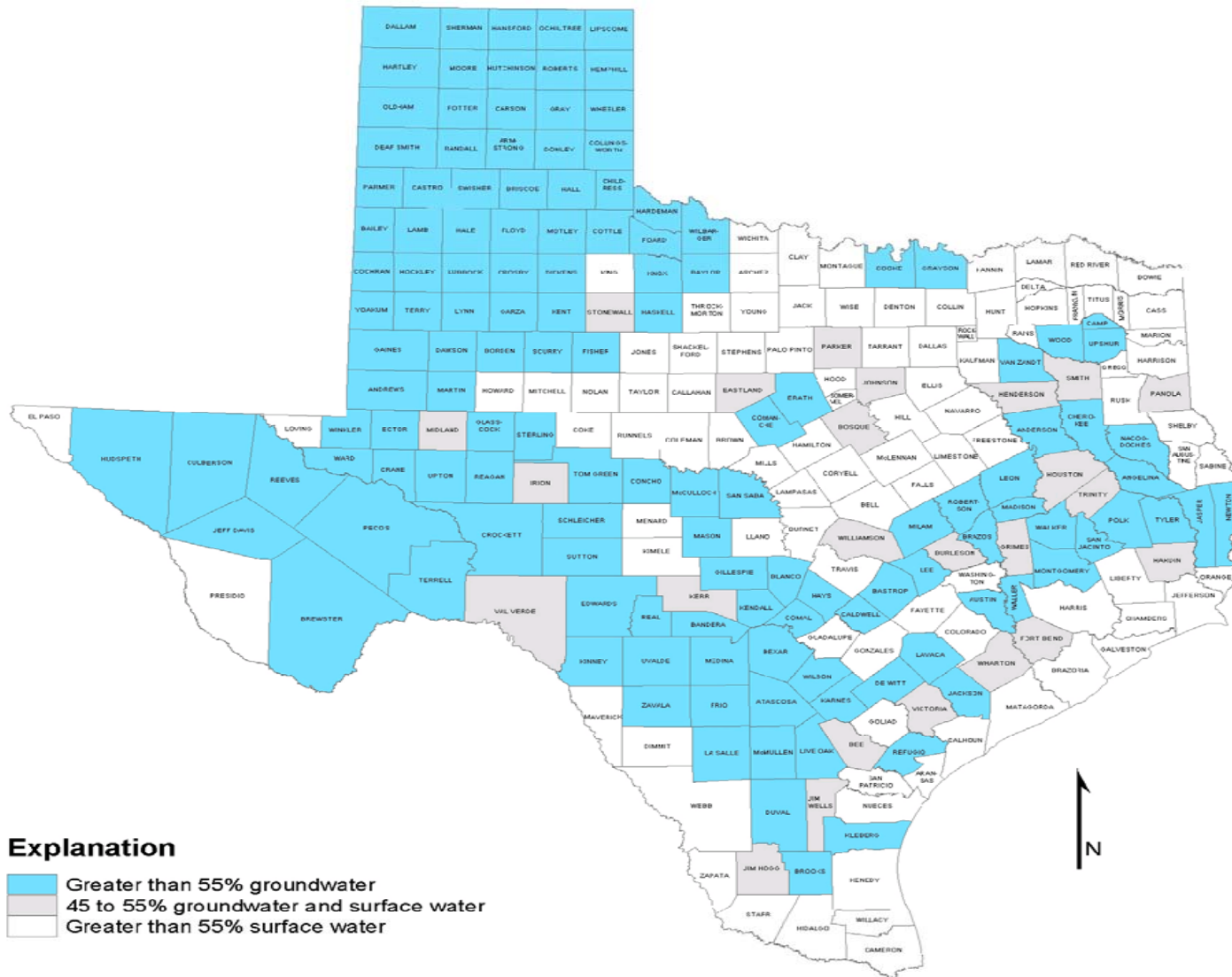


Figure 5-6 Analysis of total water use in Texas in 1999 by county illustrating dominant supply source.

Major Aquifers of Texas

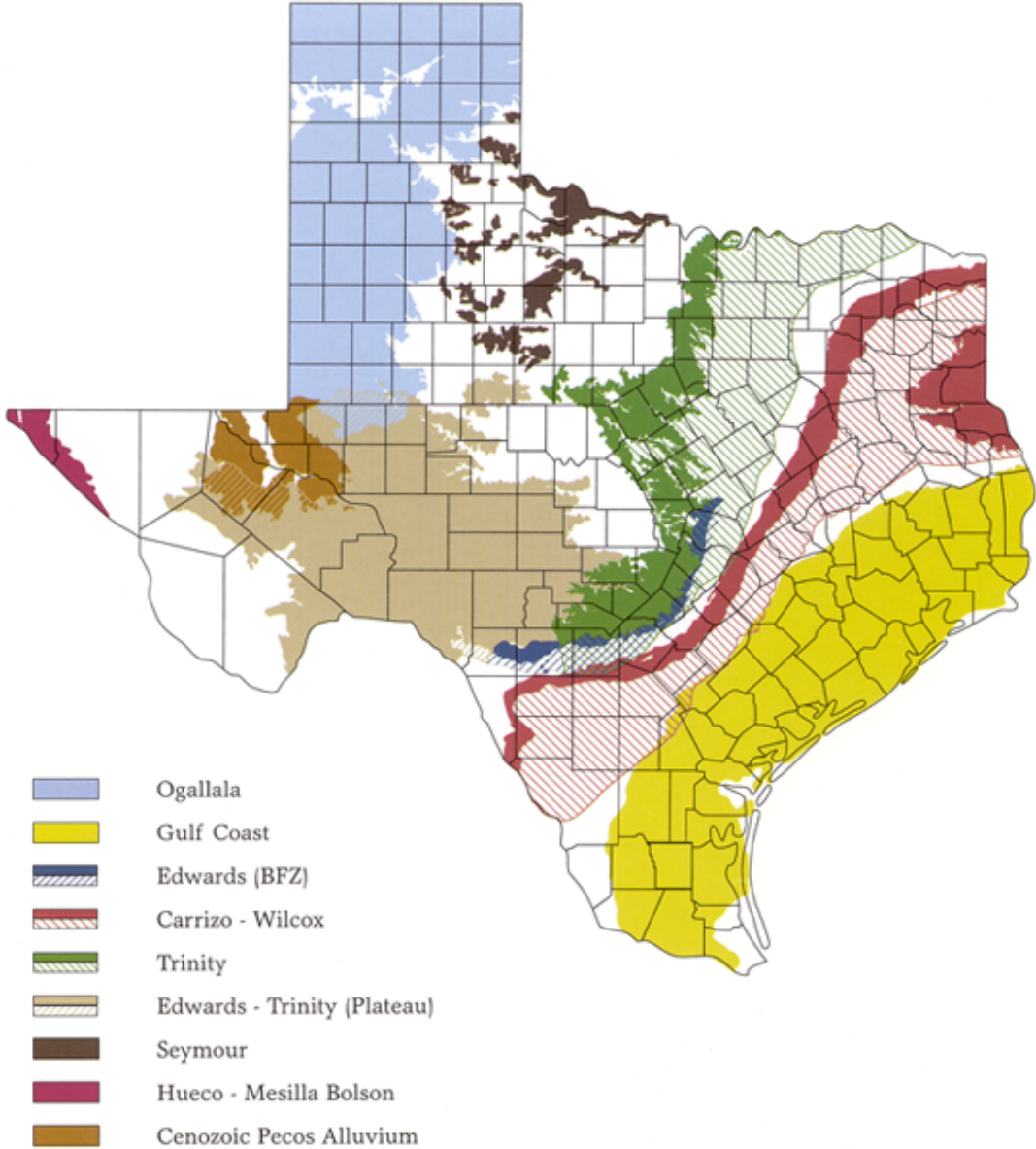


Figure 1. Nine major aquifers account for 96.3 percent of all groundwater withdrawals in Texas.

Minor Aquifers of Texas

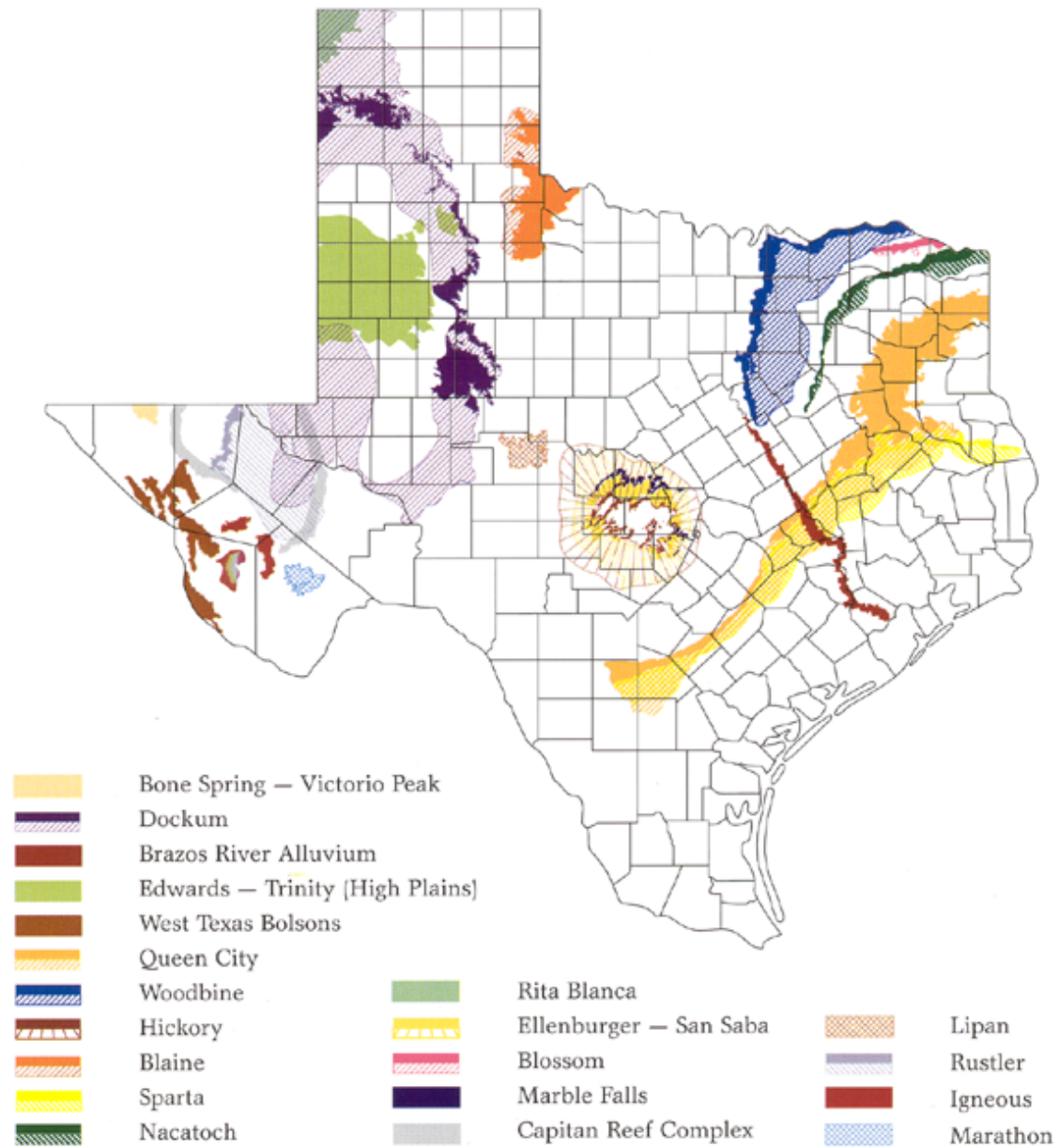
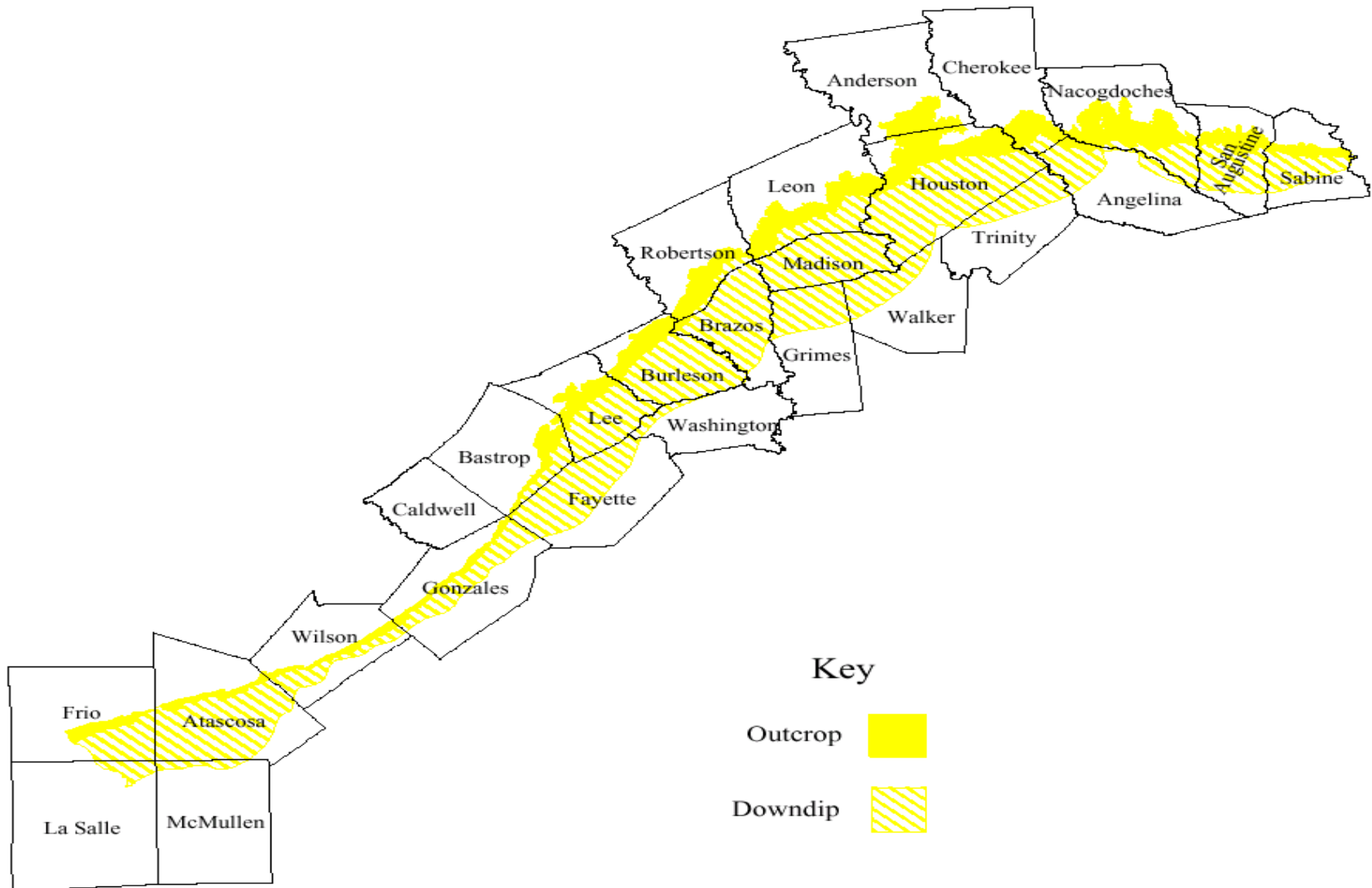
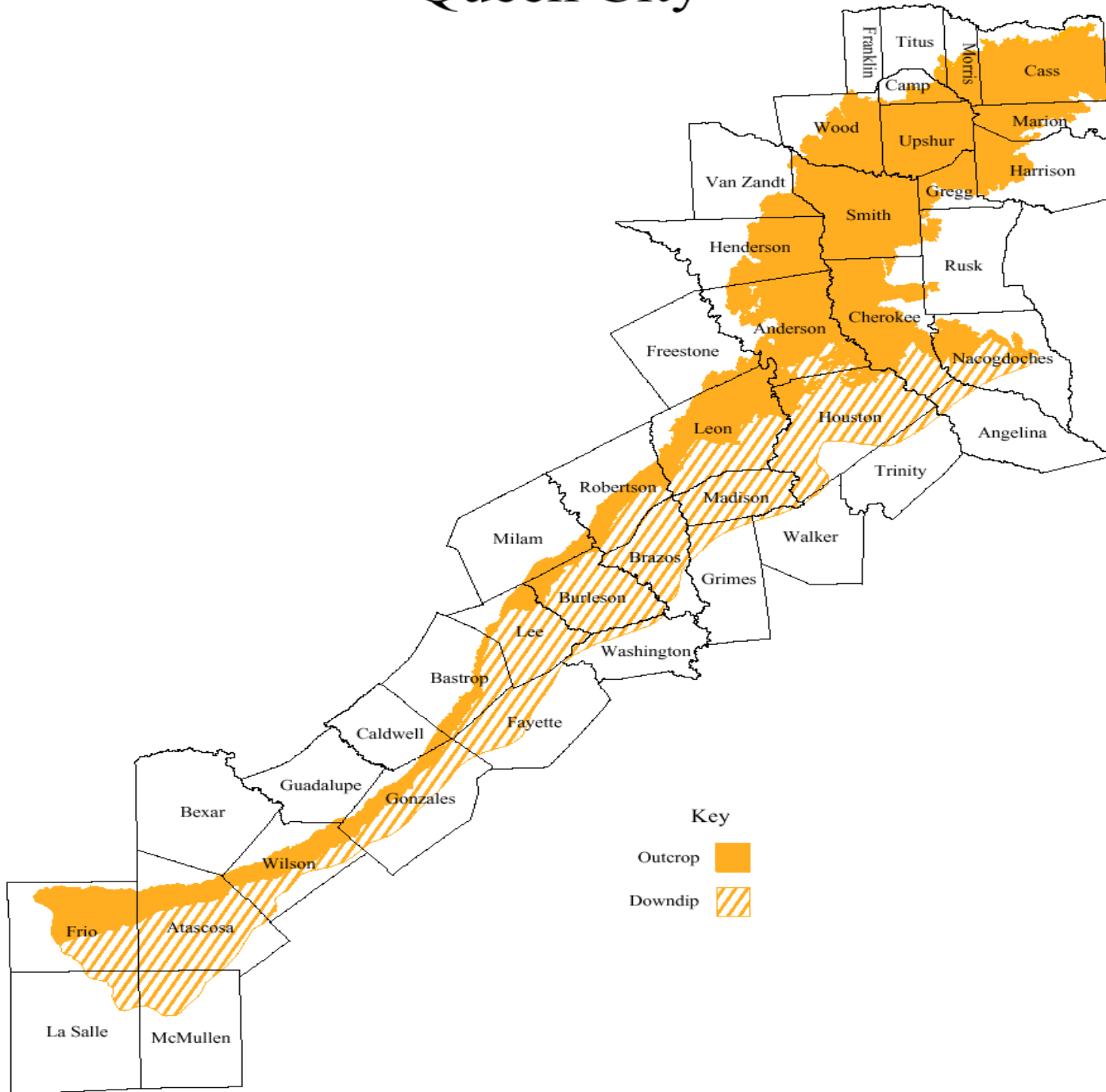


Figure 2. The 20 minor aquifers of Texas account for 3.7 percent of all groundwater withdrawals.

Sparta



Queen City



Brazos County Groundwater Resources

Source: *Ground-water Resources of
Brazos and Burleson Counties, Texas*
1974, by C.R. Follett

Water Resources Report 185,
Texas Water Development Board
<http://www.twdb.state.tx.us/>

Other TWDB Groundwater Resources Reports

- Hydrology Atlas No. 5

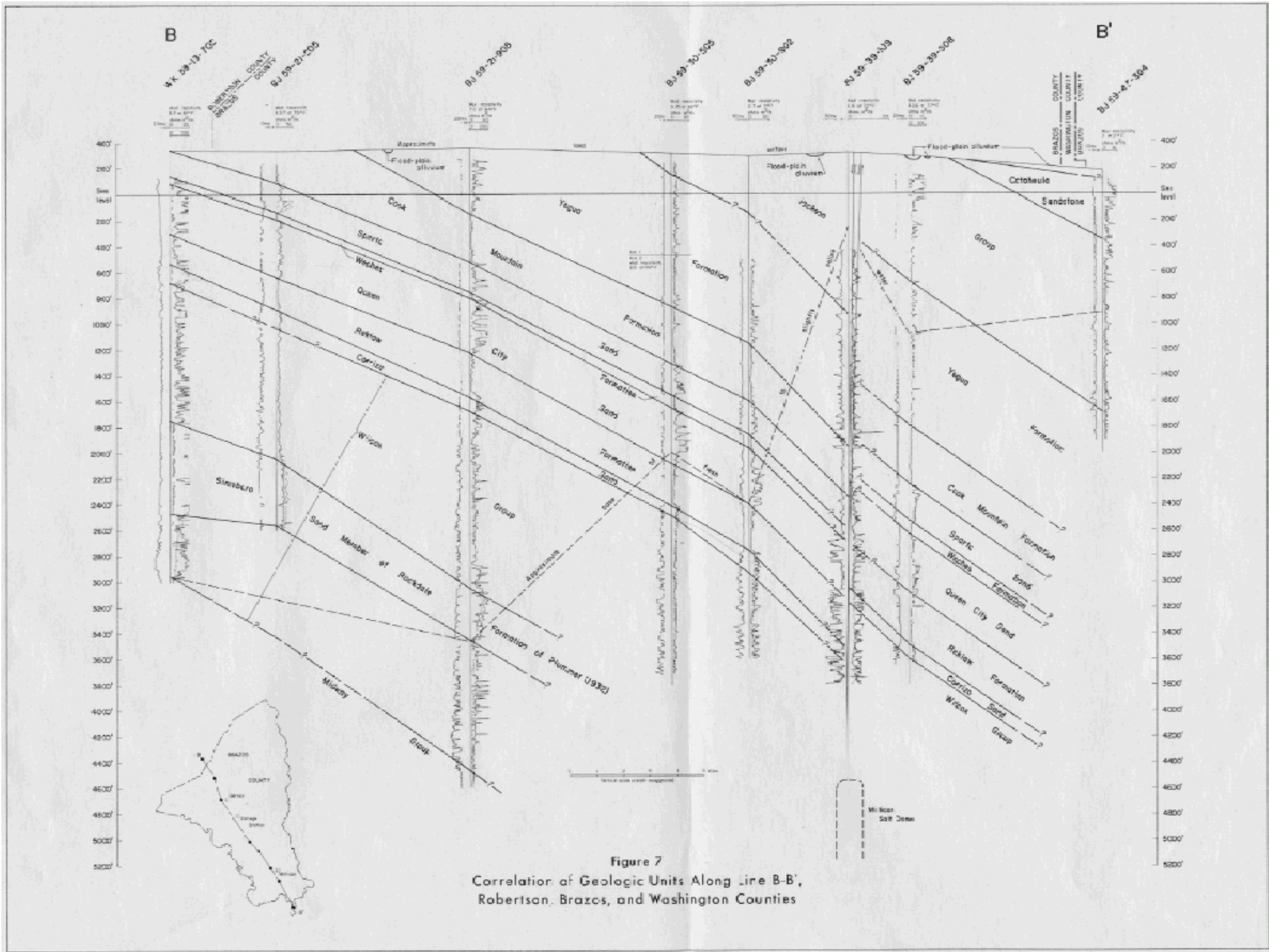
Water Quality in the Sparta Aquifer, East Texas.
Merrick Biri. 11/96

- Hydrology Atlas No. 6

Water Quality in the Queen City Aquifer, East Texas. Eric Brown. 11/96

- Hydrology Atlas No. 6

Ground-Water Resources of the Corrizo-Wilcox Aquifer in Central Texas. David Thorkildsen, Robert Price. 9/91



EXPLANATION

Well used for control
 Upper number indicates altitude of top of Queen City Sand
 Lower number indicates aggregate thickness of sand containing fresh to slightly saline water in the Queen City Sand
 "e" indicates estimated altitude

— 200 —
 Structure contour
 Shows approximate altitude of top of Queen City Sand
 Contour interval 200 feet
 Datum is mean sea level

— 50 —
 Line of equal approximate aggregate thickness of sand containing fresh to slightly saline water in the Queen City Sand
 Interval 25 feet

▲▲▲▲▲
 Approximate seaward limit of fresh to slightly saline water

— 0 —
 Feet

U, upthrown side; D, downthrown side
 Dashed where approximately located

▨
 Outcrop of the Queen City Sand

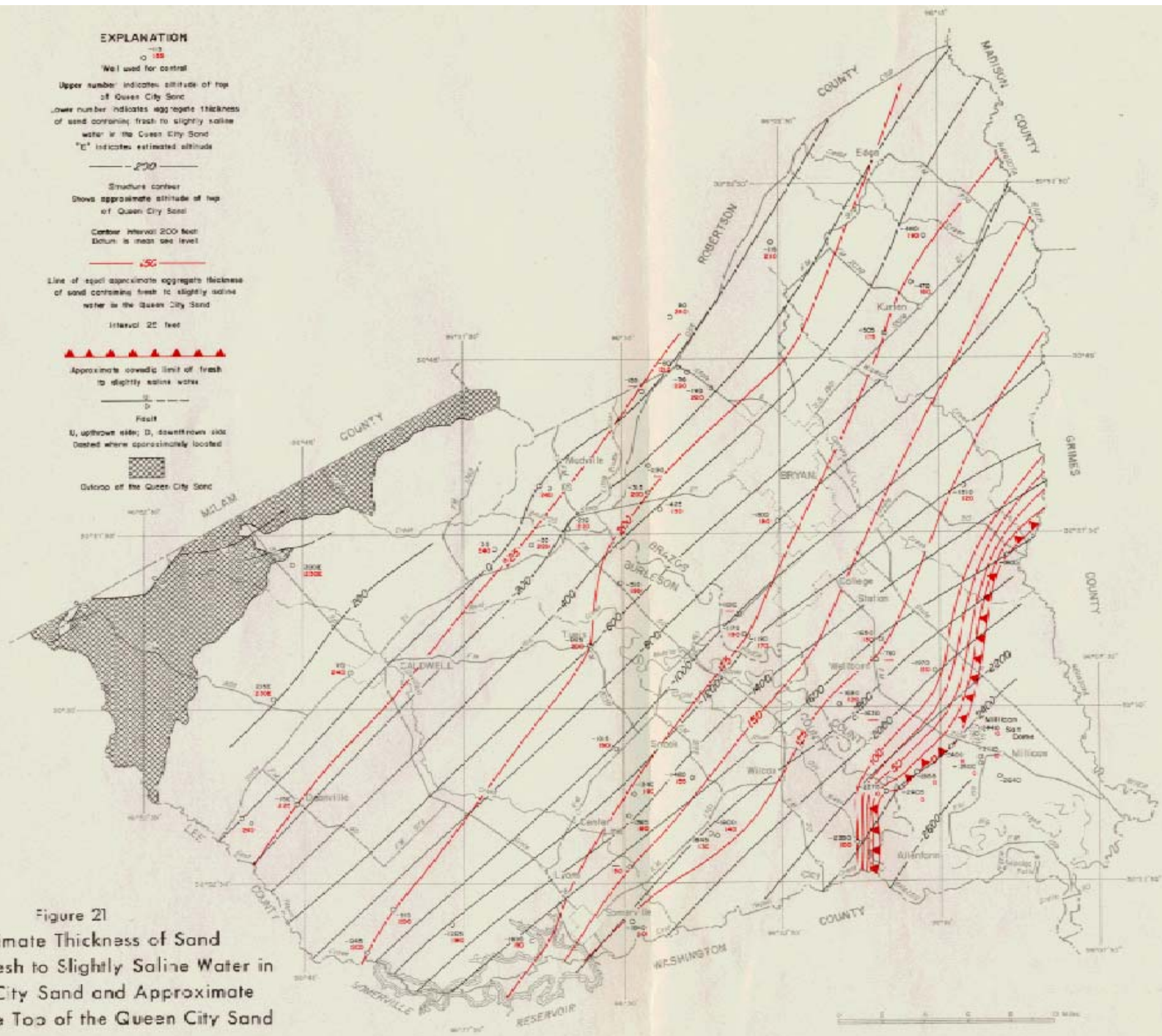


Figure 21
 Approximate Thickness of Sand
 Containing Fresh to Slightly Saline Water in
 the Queen City Sand and Approximate
 Altitude of the Top of the Queen City Sand

EXPLANATION

○ 100
○ 140
Well used for control

Upper number indicates altitude of top of Sparta Sand
Lower number indicates aggregate thickness of sand containing fresh to slightly saline water in the Sparta Sand

— 600 —
Structure contour
Shows approximate altitude of top of Sparta Sand

Contour interval 200 feet
Datum is mean sea level

— 150 —
Line of equal approximate aggregate thickness of sand containing fresh to slightly saline water in the Sparta Sand
Interval 20 feet

▲▲▲▲▲
Approximate downdip limit of fresh to slightly saline water

— 0 —
Foot

L, upthrow side; D, downthrow side
Dashed where approximately located

▨
Outcrop of the Sparta Sand

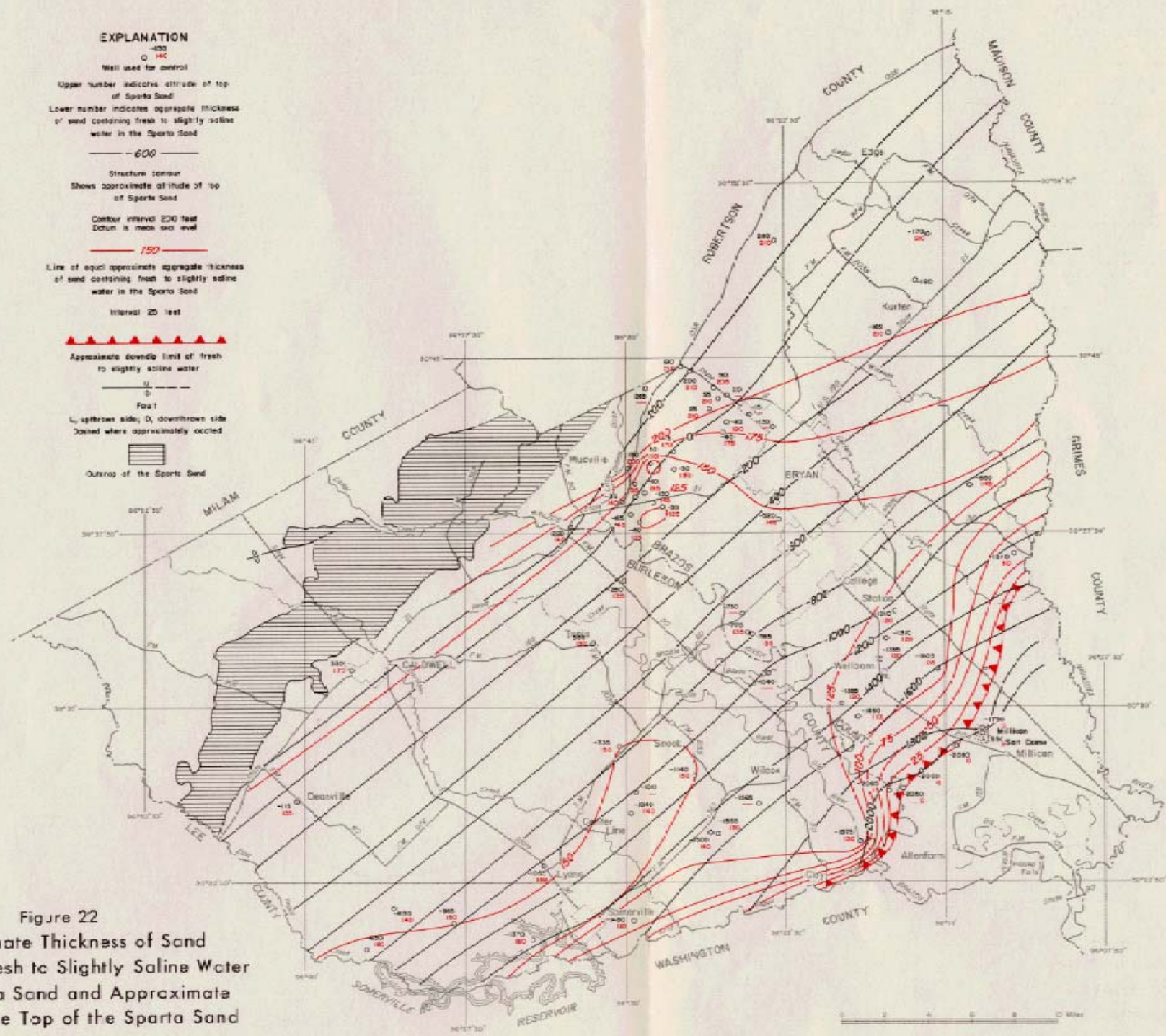


Figure 22
Approximate Thickness of Sand
Containing Fresh to Slightly Saline Water
in the Sparta Sand and Approximate
Altitude of the Top of the Sparta Sand

EXPLANATION

○ Well used for control
 Number indicates altitude of water level
 "x" indicates well flowed at altitude shown

250
 Water-level contour
 Shows approximate altitude of water level
 Contour interval 50 feet
 Dashed in main area level

Outcrop of Sparta Sand

— Fault
 U, upthrown side; D, downthrown side
 Dashed where approximately located

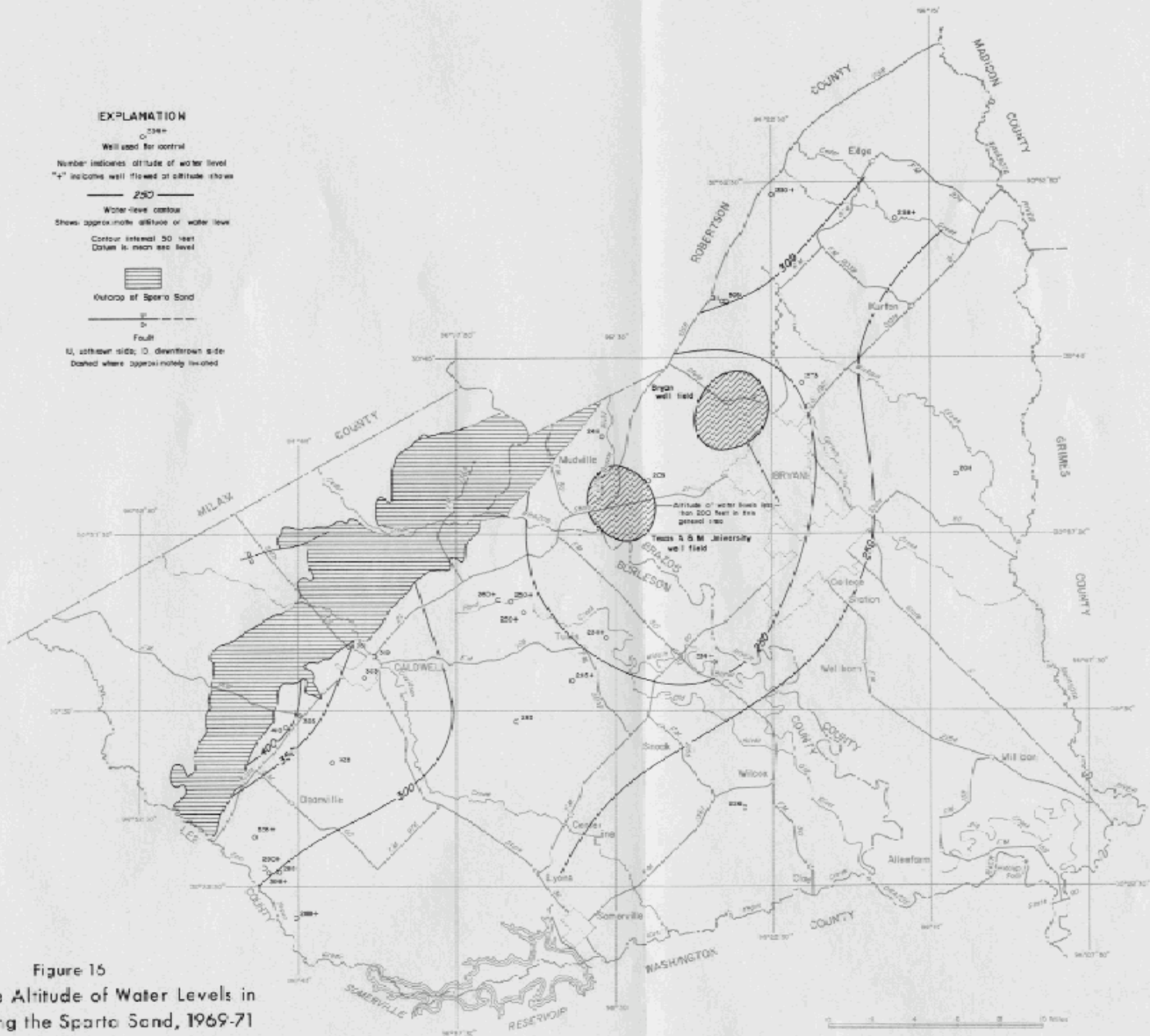
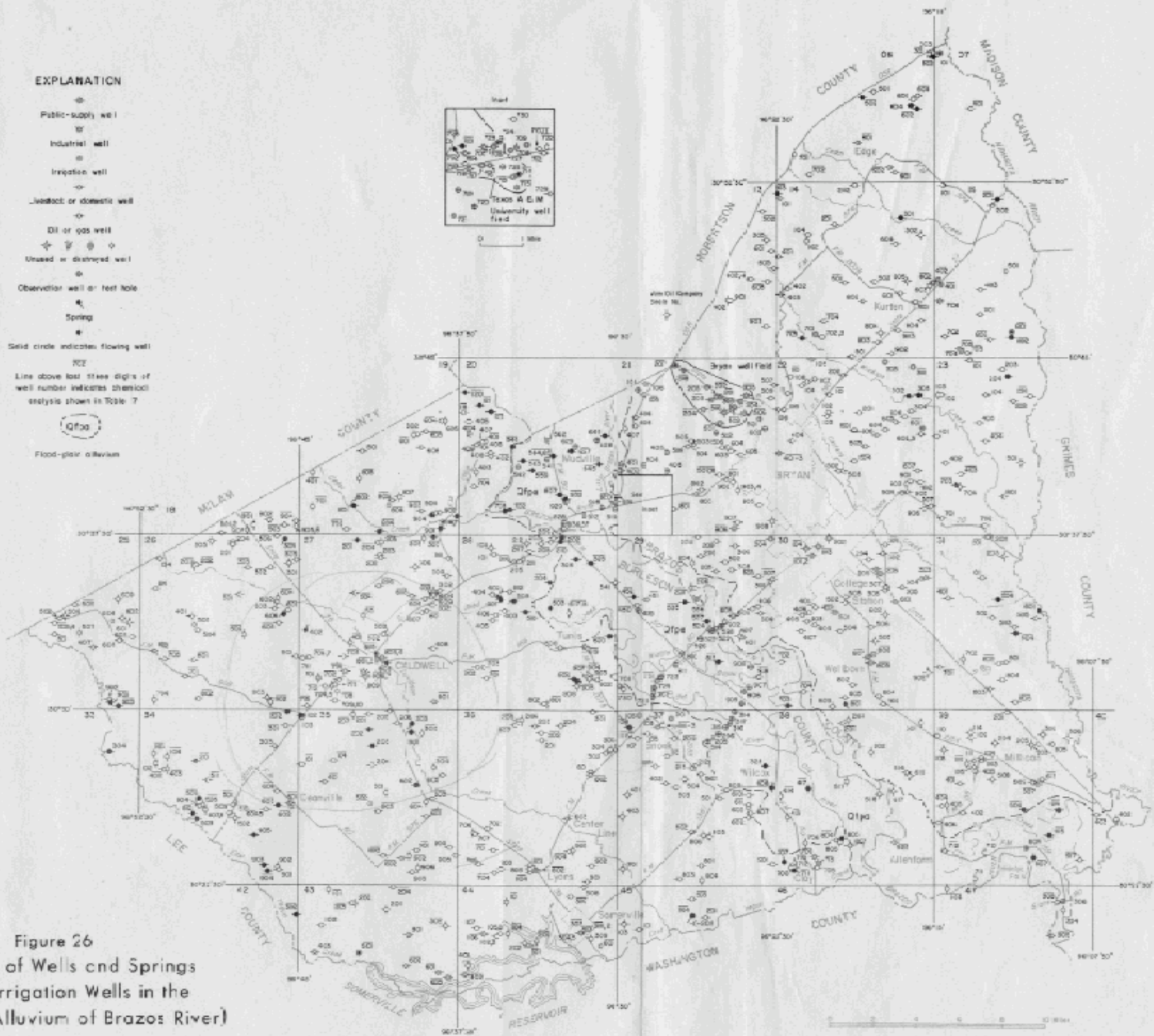


Figure 15
 Approximate Altitude of Water Levels in
 Wells Tapping the Sparta Sand, 1969-71

Based from U. S. Geological Survey
 topographic quadrangles



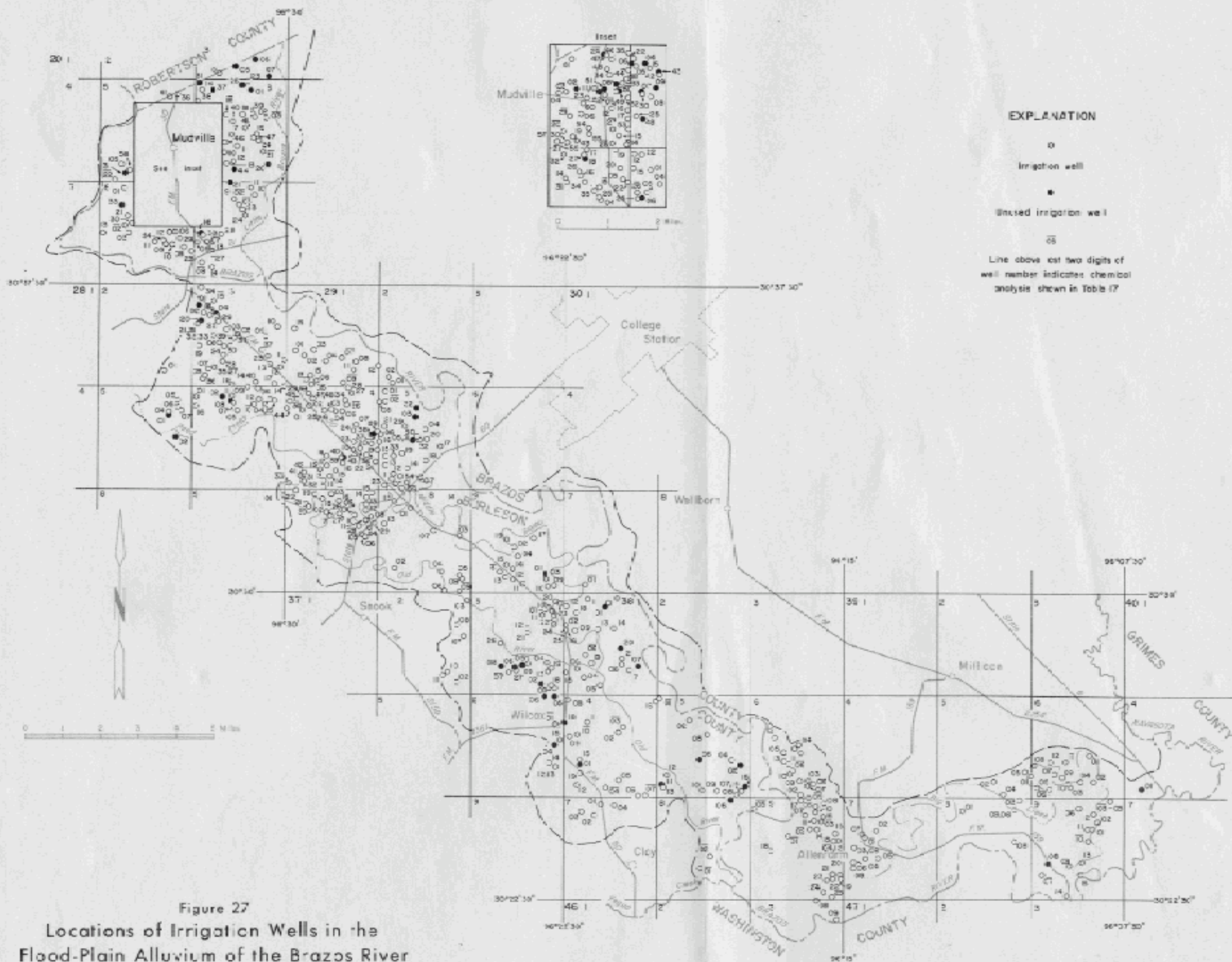


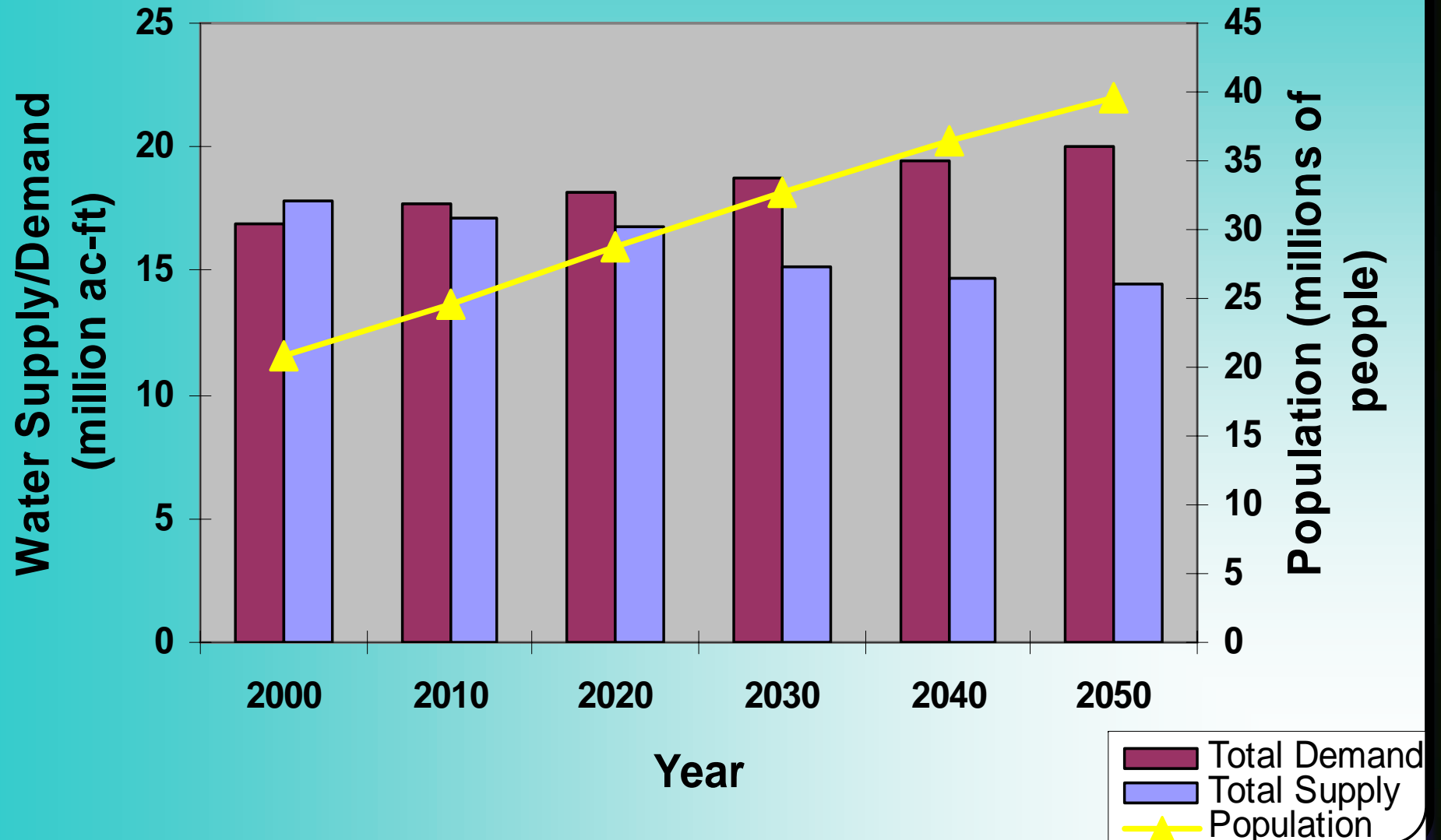
Figure 27
 Locations of Irrigation Wells in the
 Flood-Plain Alluvium of the Brazos River

Base from U.S. Geological Survey
 topographic quadrangles

Managing Texas' Groundwater Resources

- Population and industrial growth in Texas is forecasted to outstrip available supply
- Groundwater depletion and competition is a major problem in parts of the state

Projected Water Supply/Demand and Population for Texas



AREAS EXPERIENCING SIGNIFICANT
GROUND-WATER LEVEL DECLINE,
1980-1990

BY
JANIE PAYNE, GEOLOGIST
1991

- Declines of 20-40 feet in water table areas
- Declines greater than 40 feet in water table areas
- Declines of 50-100 feet in artesian areas
- Declines greater than 100 feet in artesian areas



Areas in Texas With
Existing or Potential
Underground Water Problems



- Areas proposed for detailed study by TWC/TWIF
- Critical areas proposed by TWC July, 1995

Priority Groundwater Management Area Studies

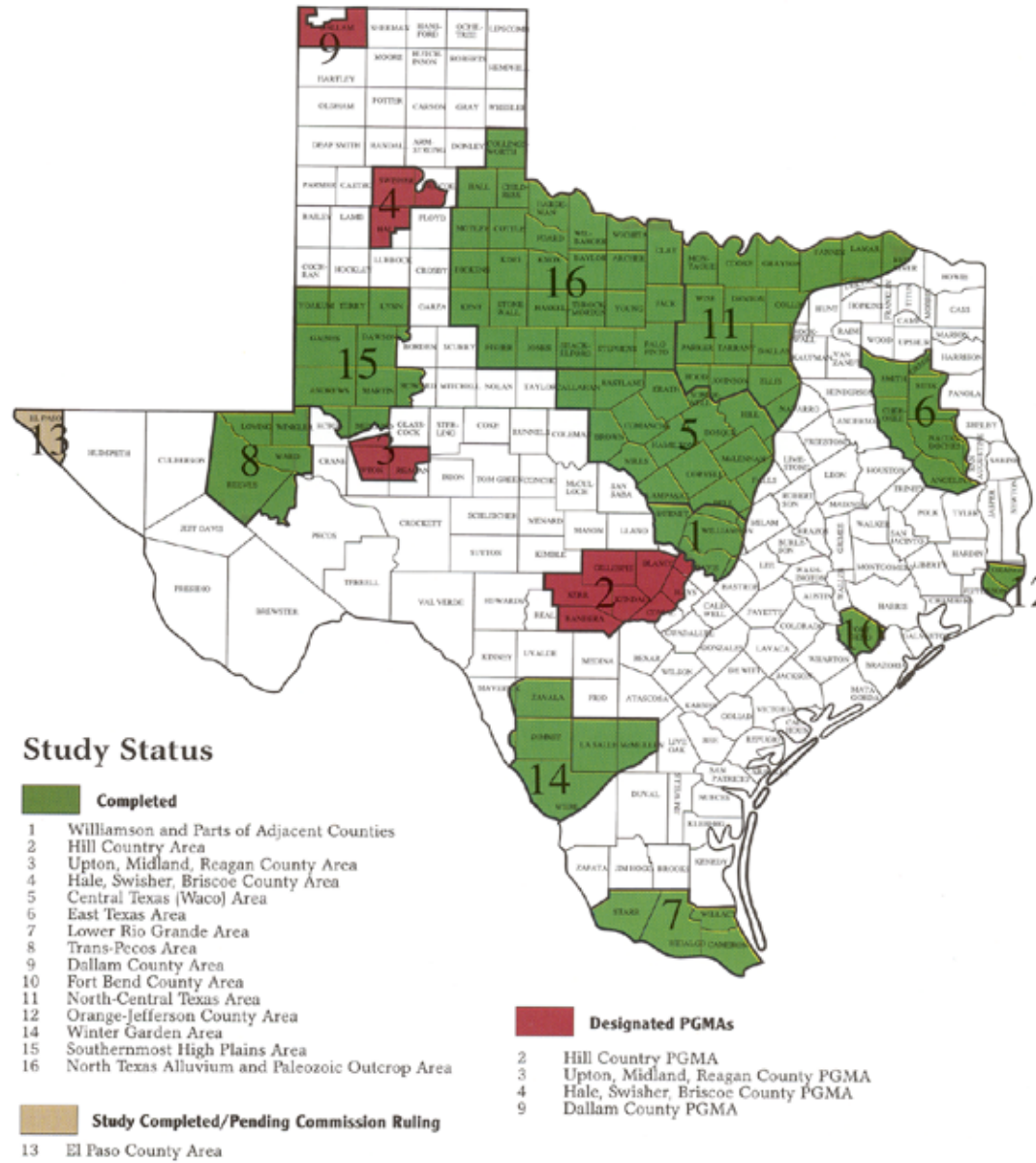


Figure 3. Studies have been conducted in these areas because of existing or potential groundwater supply or quality problems.

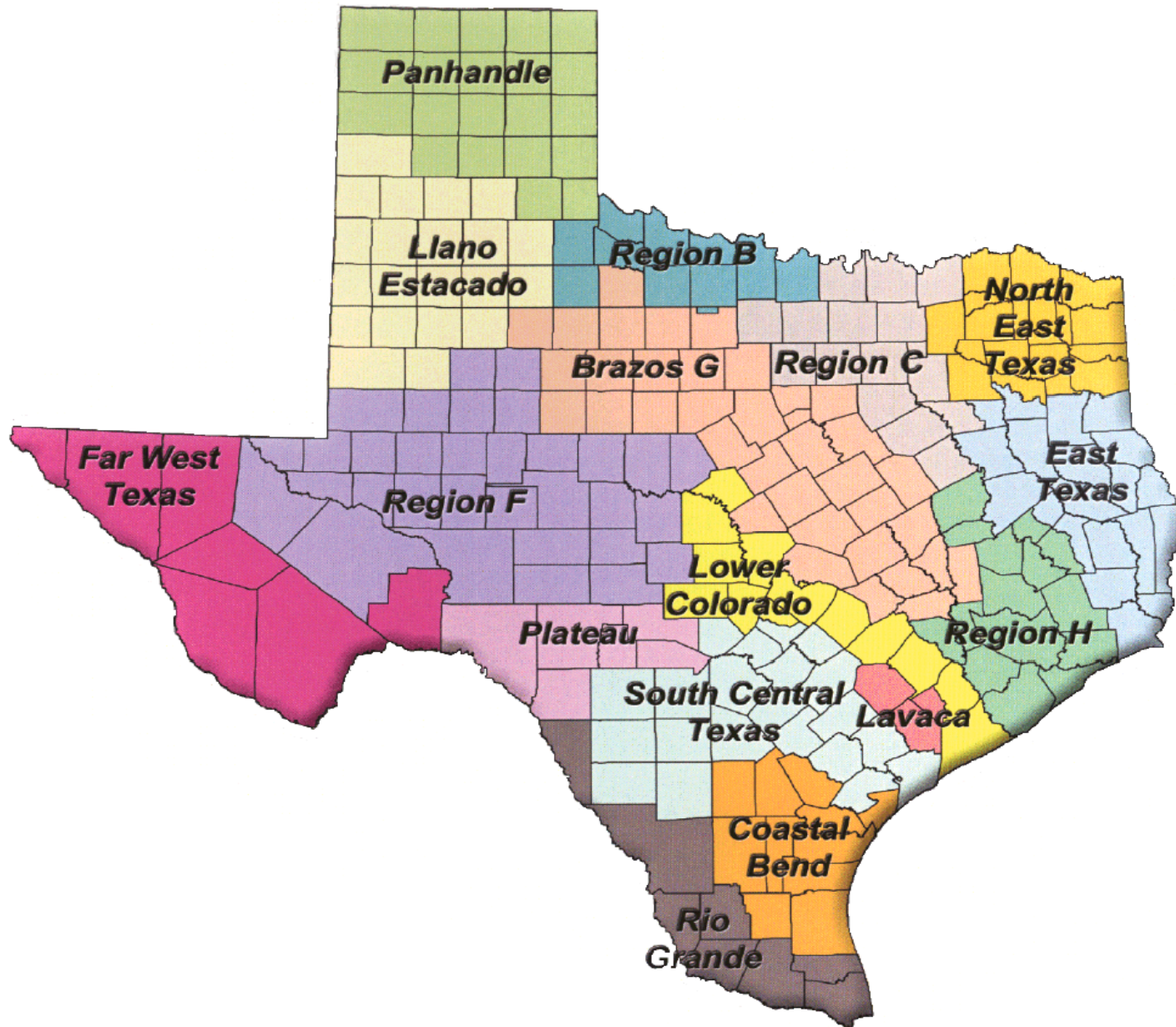
STATE WATER PLAN

Water for Texas 2002

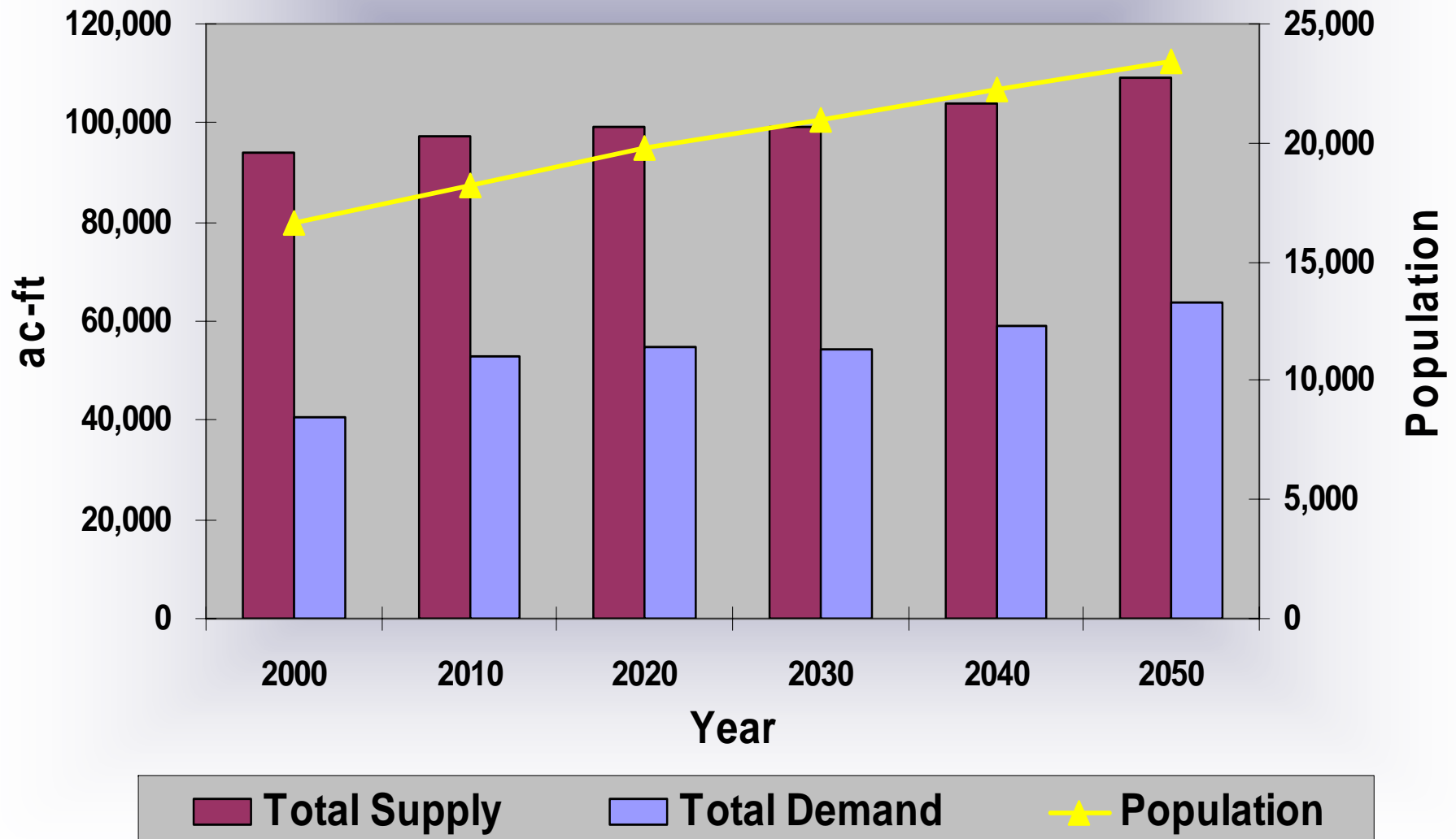
Texas Water Development Board

(Currently being printed and posted to
TWDB Website)

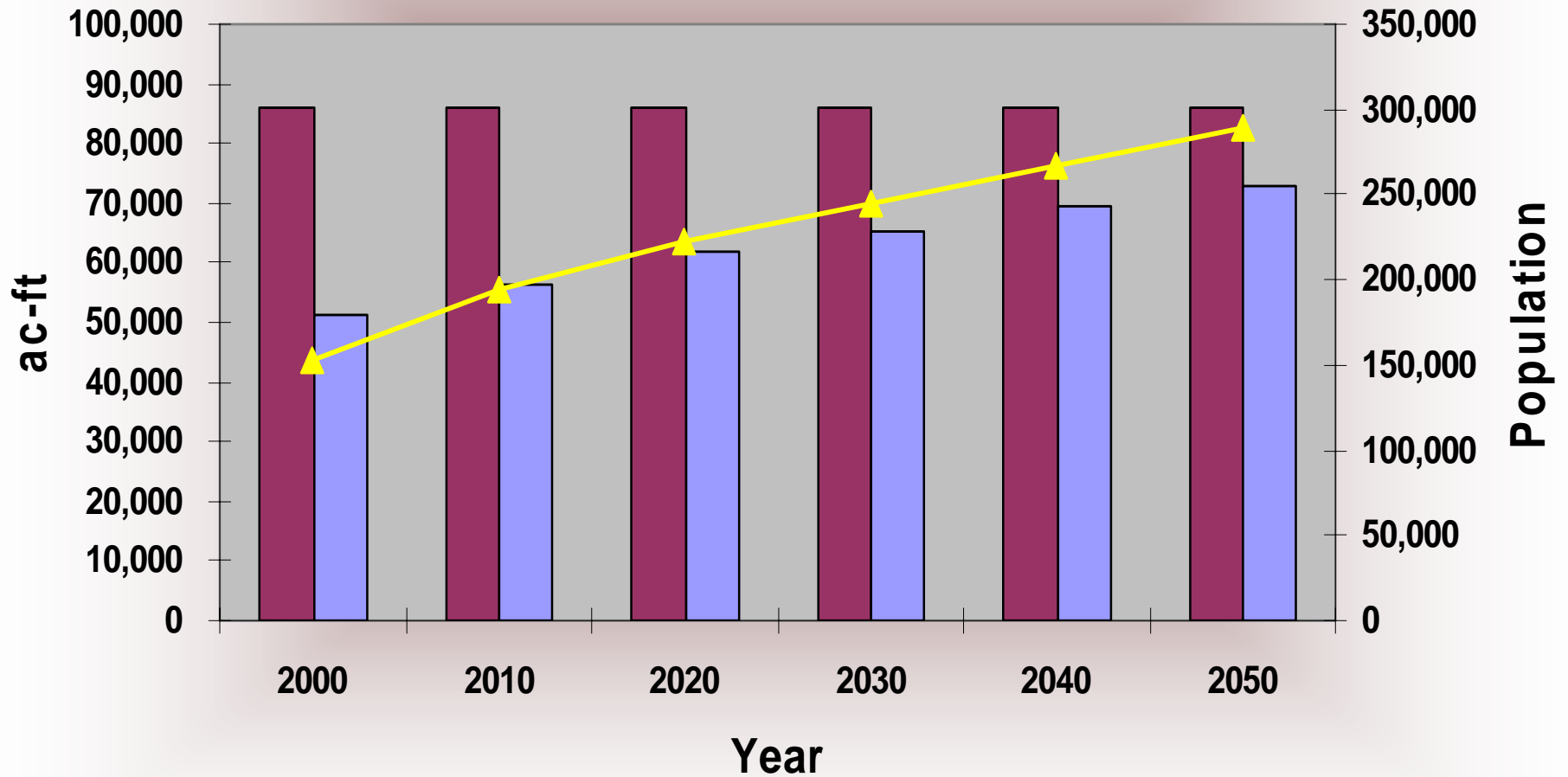
Figure 4-1: Location of the 16 regional water planning areas in Texas.



Robertson County Water Supply/Demand and Population



Brazos County Water Supply/Demand and Population

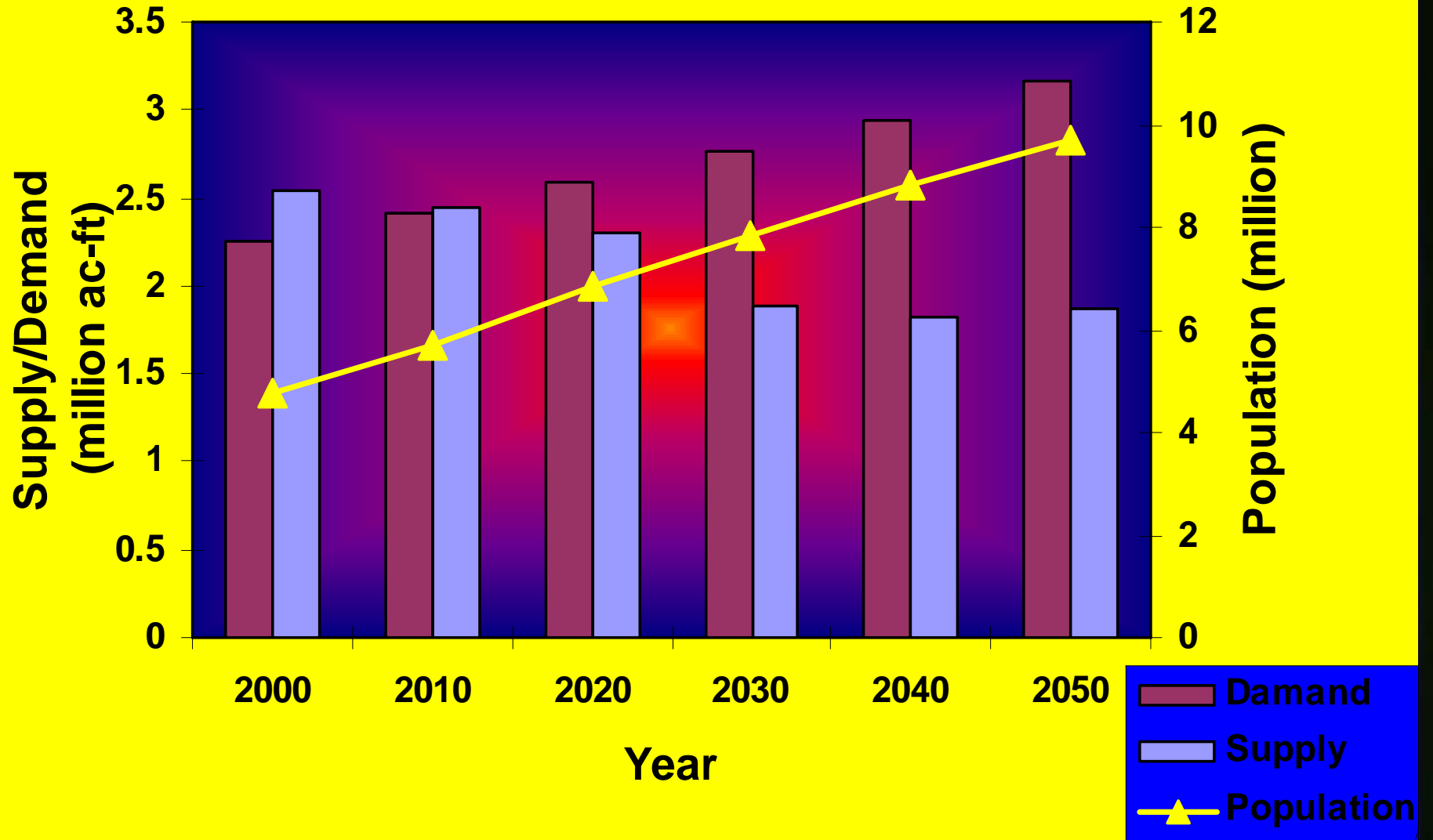


 Total Supply

 Total Demand

 Population

Projected Water Supply/Demand and Population for Region H



Texas Water Law

Surface Water and Groundwater are treated differently under the Law

Texas Water Law

Surface Water

- All surface water (except "*diffused water*") belongs to the state
- It is "*held in trust*" and appropriated to users through permits or *water rights*

Texas Water Law

Groundwater

- Based on the English common law document or the "rule of capture"
- Landowner has unlimited right to withdraw and make "*non-wasteful*" use of groundwater

Texas Water Law

Non-beneficial use of Groundwater

- Allowing groundwater to escape from one geological formation to another that does not contain water

Texas Water Law

Non-beneficial use of Groundwater

- Polluting a groundwater reservoir by salt water or other substances
- Causing groundwater to escape into surface water without authorization

Texas Water Law

Groundwater

"Law of the biggest pump"

*...the deepest well and most powerful
pump get the water*

GROUNDWATER CONSERVATION DISTRICTS

- First legislation enacted in 1949
- Based on the philosophy of:
locally controlled groundwater conservation districts to manage groundwater resources
- Confirmation election required


Groundwater Districts

Conservation Districts

- 1 Dallam County UWCD No. 1
- 2 North Plains GWCD No. 2
- 3 Hemphill County UWCD
- 4 Panhandle GWCD No. 3
- 5 Collingsworth County UWCD
- 6 High Plains UWCD No. 1
- 7 Sandy Land UWCD
- 8 South Plains UWCD
- 9 Garza County U and Fresh WCD
- 10 Salt Fork UWCD
- 11 Mesa UWCD
- 12 Permian Basin UWCD
- 13 Hudspeth County UWCD No. 1
- 14 Glasscock County UWCD
- 15 Sterling UWCD
- 16 Coke County UWCD
- 17 Santa Rita UWCD

- 18 Irion County WCD
- 19 Lipan-Kickapoo WCD
- 20 Fox Crossing WD
- 21 Jeff Davis County UWCD
- 22 Emerald UWCD
- 23 Plateau UWC and Supply District
- 24 Hickory UWCD No. 1
- 25 Saratoga UWCD
- 26 Sutton County UWCD
- 27 Hill Country UWCD
- 28 Real-Edwards Conservation and Reclamation District
- 29 Headwaters UWCD
- 30 Springhills Water Management District
- 31 Barton Springs/Edwards Aquifer CD
- 32 Plum Creek Conservation District
- 33 Uvalde County UWCD
- 34 Medina UWCD
- 35 Gonzalez County UWCD
- 36 Wintergarden GCD
- 37 Evergreen UWCD
- 38 Live Oak UWCD
- 39 Anderson County UWCD
- 40 Culberson County GCD (boundaries not defined)

Special Districts

-  Edwards Aquifer Authority
- 41 Fort Bend Subsidence District
- 42 Harris-Galveston Coastal Subsidence District

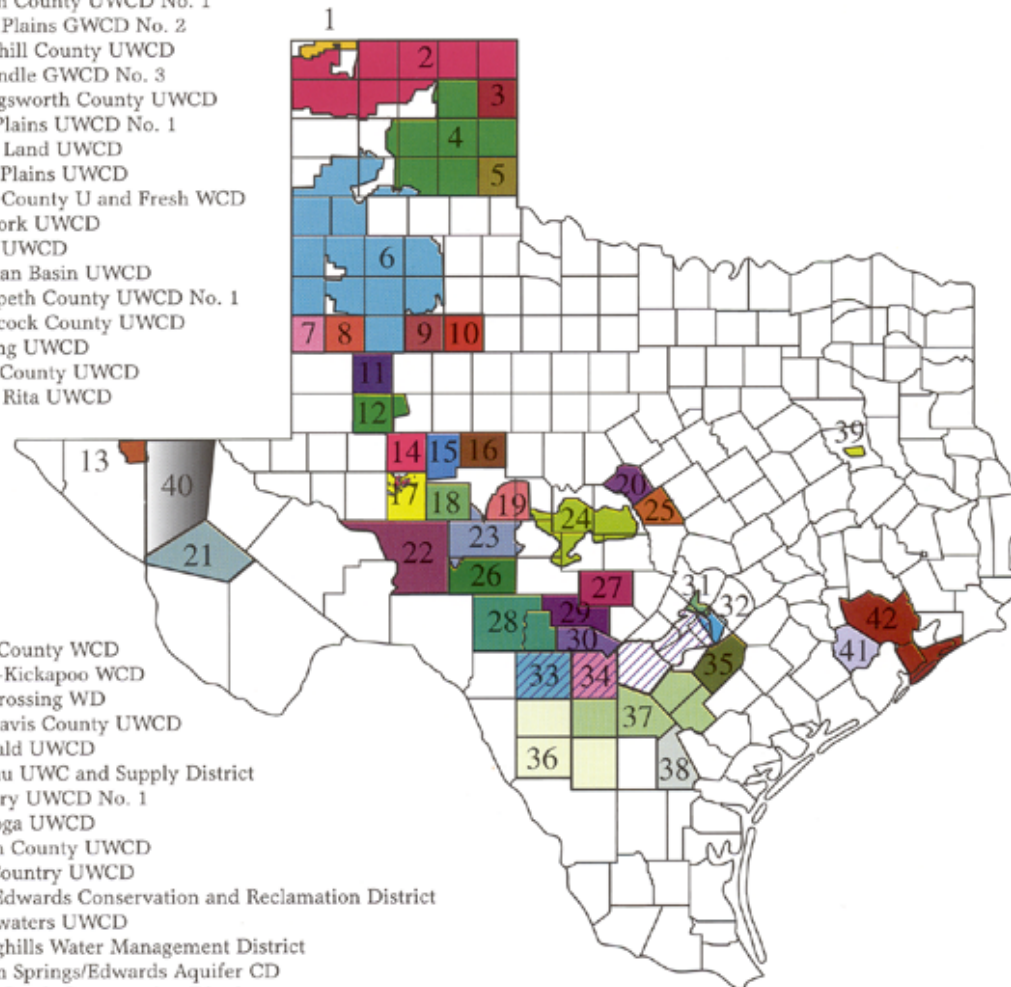
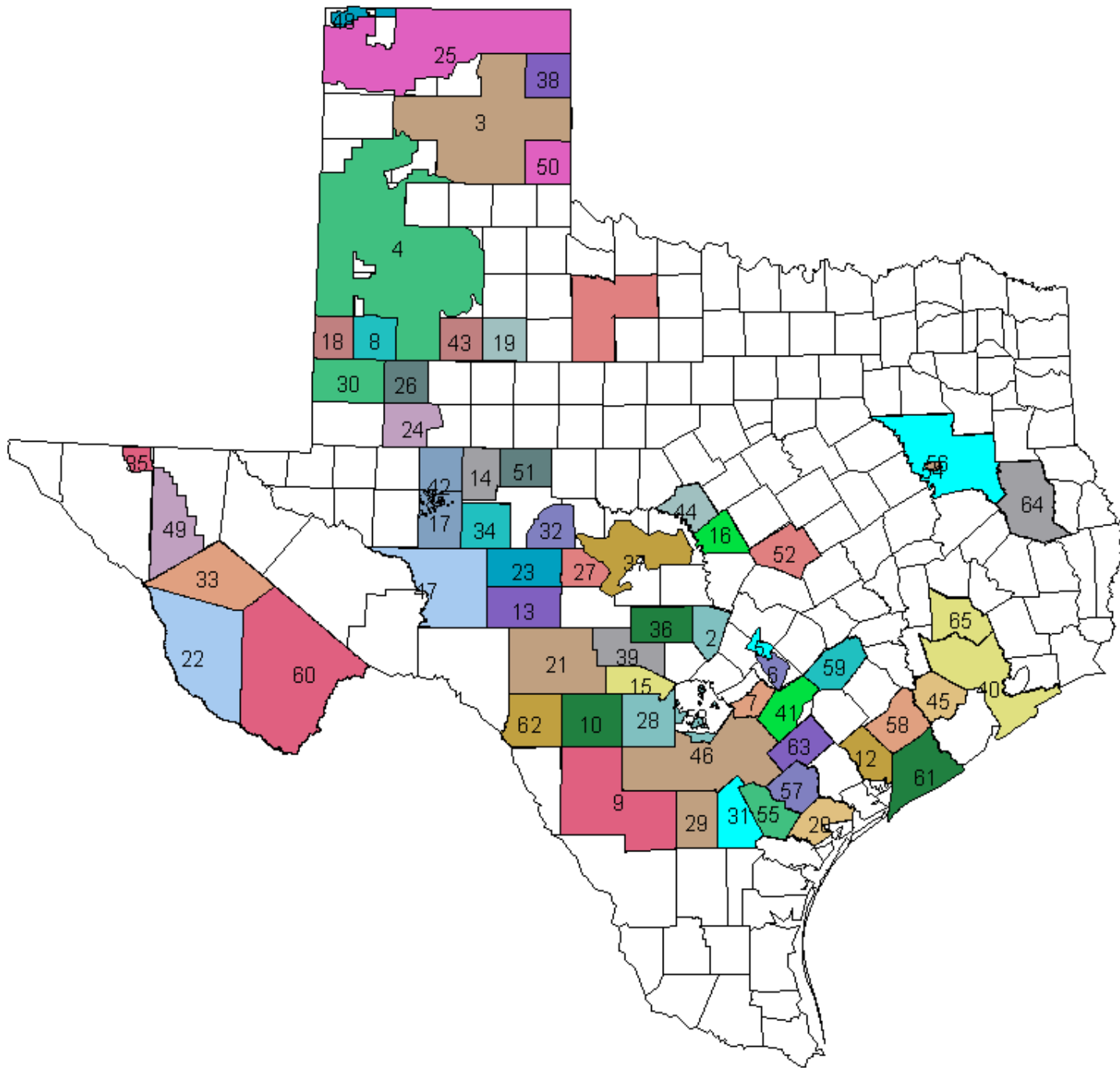
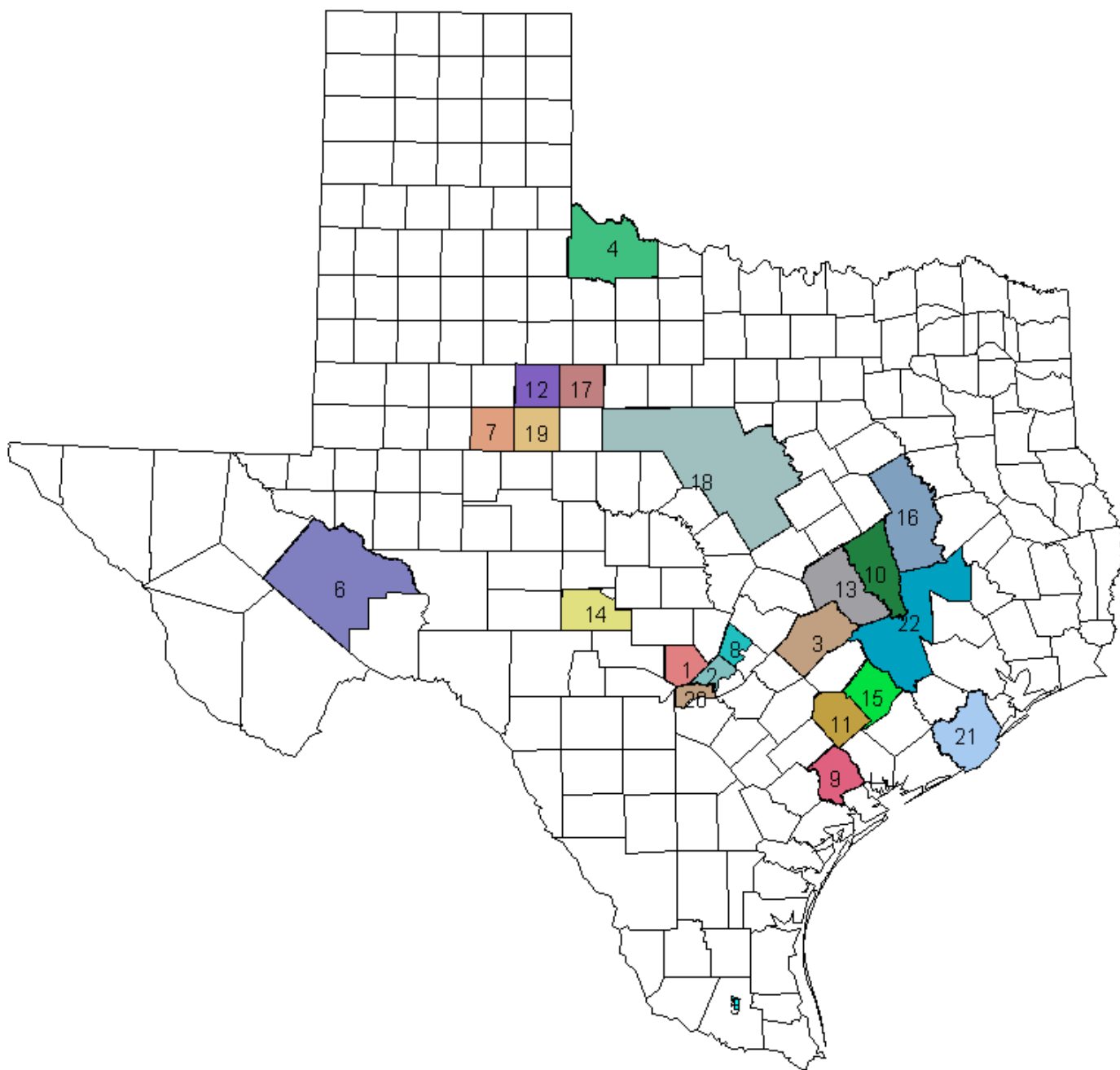


Figure 4. There are 43 groundwater conservation and special districts in Texas. The Edwards Aquifer Authority contains two conservation districts within its territory.





GROUNDWATER CONSERVATION DISTRICTS

Powers and Responsibilities

- Required (*districts must do.....*)
 - organizational/procedural requirements
 - duties
- Optional (*districts may do.....*)

Powers and Responsibilities

Organizational/procedural requirements

- Operate on a fiscal year with an annual budget, audit accounts
- Hold regular board meeting - at least quarterly, keep minutes of meetings, preserve records
- Register board members and confirm election results with the the TNRCC

Powers and Responsibilities

Required Duties

- Develop and adopt a management plan, coordinate with regional water planning groups and other districts
- Require permits for wells
(except for exempt wells)
- Keep records on water wells
- Make information on groundwater resources available to the TNRCC, TWDB

Powers and Responsibilities

Optional

- Adopt rules to conserve, protect, recharge and prevent waste of groundwater
- Regulate the spacing and production of wells
- Enforce rules
- Acquire land, construct dams, install pumps and equipment for groundwater recharge
- Purchase, sell, transport and distribute surface and groundwater

Powers and Responsibilities

Optional (continued)

- Exercise eminent domain to acquire property necessary for the exercise of authorized duties
- Carry out research projects
- Levy taxes, set fees
(as authorized in enabling legislation)
- Issue bonds
- Regulate the transfer of water out of district

Permitting of Wells

Wells exempt from permit requirements

- Domestic and/or livestock wells
 - on tracks larger than 10 acres
 - incapable of producing more than 25,000 gallons per day

Permitting of Wells

Wells exempt from permit requirements

- Wells providing water for mining, oil and gas exploration/operations
 - with permits from the Railroad Commission
 - unless well production is in excess of mining requirements

Permitting of Wells

Wells exempt from permit requirements

- Any other type of well exempted by the district
 - must apply to all similar wells in the district

Transfer of Groundwater out of the District

- May require permits for water transfers
- Districts are to consider:
 - groundwater availability
 - effects of proposed transfer on groundwater supply and existing permit holders
 - implications to the regional water plan and district's management plan

Transfer of Groundwater out of the District

- Transfer permits may not be more restrictive than requirements for in-district users
- A 50% export surcharge may be imposed in addition to the production fee

GROUNDWATER CONSERVATION DISTRICTS

Financing of Districts

- May be through a property tax and/or production fees
- Enabling legislation often specifies:
 - financing method
 - tax, production caps or rates

Financing of Districts

Unless specified in enabling legislation

- tax rate capped at \$0.50 per \$100 valuation
(note: only 2 districts have rates above \$0.10)
- Production rate capped at:
 - \$1 per acre-foot/year for agricultural use
 - \$10 per acre-foot/year for other uses

Brazos Valley
Groundwater Conservation District

Created under HB 1784
(expiration date 8/31/03)

*District will be financed through
production fees (no tax authority)*

Brazos County Groundwater Conservation District

- **Production rate capped at:**
 - \$0.25 per acre-foot for agricultural irrigation use
 - \$0.0425 per 1000 gallons for other uses
(or \$1.15 ac-in, \$13.80 ac-ft)
- **Transfer Fees**
 - \$0.17 per 1000 gallons
(or \$4.62 ac-in, \$55.44 ac-ft)
 - or as negotiated with transporter
- **Bond debt limited to \$500,000**

Financing of Districts

Fees for Administrative Services

Permit and other fees must not

*"reasonably exceed the cost of
providing these services"*

GROUNDWATER CONSERVATION DISTRICTS "Special Districts"

Legislature can give special powers to districts to address specific water problems

GROUNDWATER CONSERVATION DISTRICTS

"Special Districts"

- Harris-Galveston Subsidence District (1975)
- Ft. Bend Subsidence District (1989)
- Edwards Aquifer Authority (1993)

Creation of Groundwater Conservation Districts

- Action of the Legislature
- Petition by Property Owners
- Initiation by the TNRCC priority groundwater management areas
- Adding territory to an Existing District

Groundwater Conservation Districts

Based on the philosophy of

- *local management of groundwater resources*
- *through groundwater conservation districts*

Groundwater Conservation Districts

For more information:

- *Managing Texas' Groundwater Resources through Groundwater Conservation Districts*

Texas Cooperative Extension Publication

<http://texaserc.tamu.edu/>

(currently being revised – completion date 3/02)

- **Texas Water Development Board's Website**

on state water plan, water projections, etc....

<http://www.twdb.state.tx.us/>

Groundwater Conservation Districts

For more information:

This presentation will be posted on
my website:

<http://gfipps.tamu.edu>