

# Aquifer Desired Future Conditions Update



Presented to  
BVGCD Board of Directors  
By  
WSP USA

April 10, 2018



# Desired Future Conditions

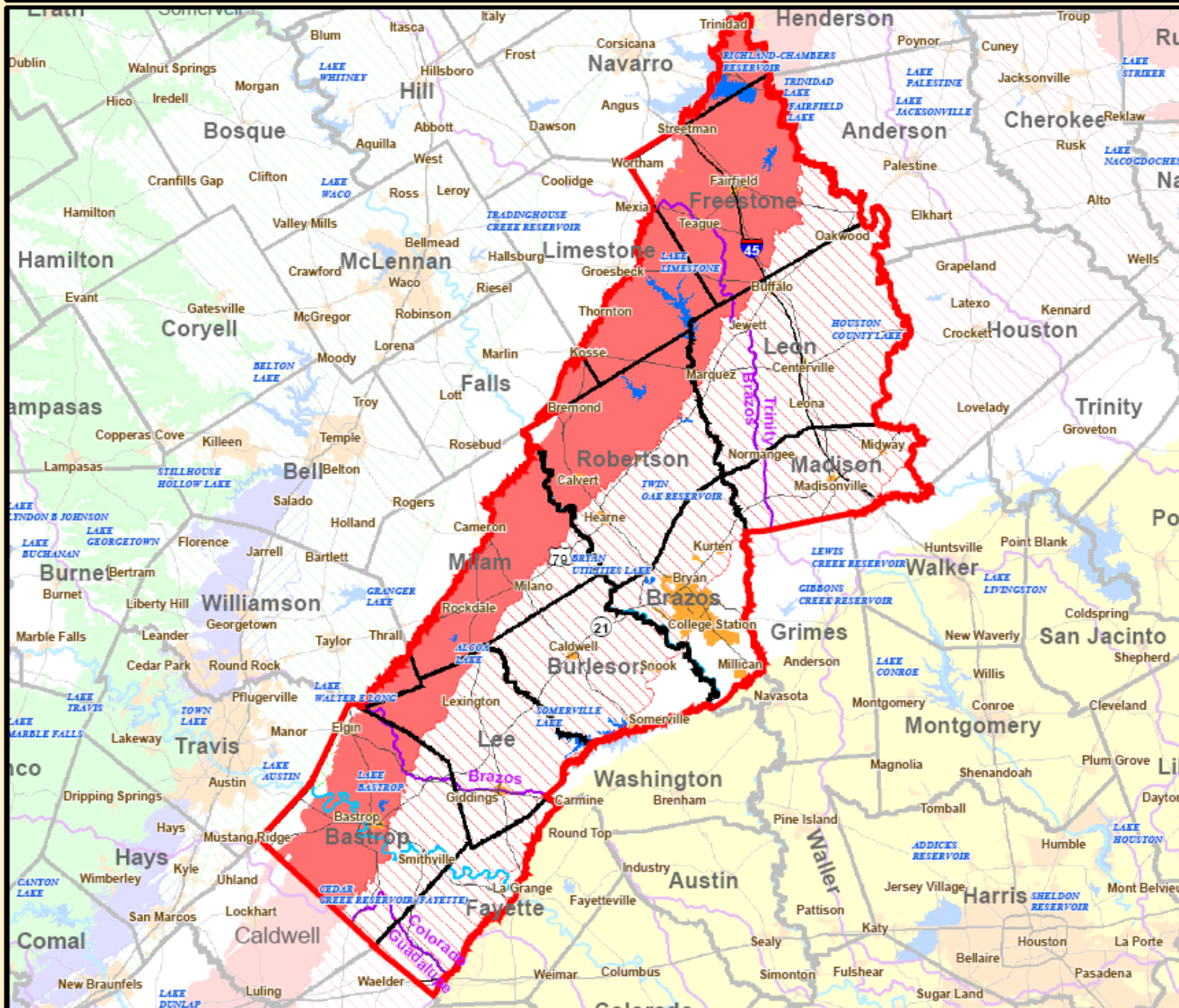
- ❖ Established for Sparta, Queen City, Carrizo, Calvert Bluff, Simsboro, Hooper, Yegua, Jackson and Brazos River Alluvium aquifers
- ❖ Use average artesian head decline over aquifer areas as matrix for quantifying progress toward reaching Desired Future Conditions (DFC), except for Brazos River Alluvium where matrix is percent aquifer saturation
- ❖ Well static water-level data used to help monitor aquifer response to pumping

# Desired Future Conditions

## (cont'd)

- ❖ DFCs established based on estimates of effects of pumping in the District and the effects of pumping in other areas inside GMA 12
- ❖ Current cycle of GMA 12 planning developed DFCs for 2070

# Groundwater Management Area #12



### MAP LEGEND

- GMA #12
- River
- River Basin
- Reservoir
- Cities
- Counties

### Major Aquifers

- Cenozoic Pecos Alluvium
- Seymour
- Gulf Coast
- Carrizo - Wilcox (outcrop)
- Carrizo - Wilcox (downdip)
- Hueco - Mesilla Bolson
- Ogallala
- Edwards - Trinity Plateau (outcrop)
- Edwards - Trinity Plateau (downdip)
- Edwards BFZ (outcrop)
- Edwards BFZ (downdip)
- Trinity (outcrop)
- Trinity (downdip)

DISCLAIMER  
No claims are made to the accuracy or completeness of the data nor to its suitability for a particular use. The scale and compilation of all information shown here is approximate.  
Map prepared by Mark Hayes  
Texas Water Development Board  
GIS Section  
10/21/2008



0 7 14 21 28 Miles  
4/10/2018 4  
1 inch equals 26 miles

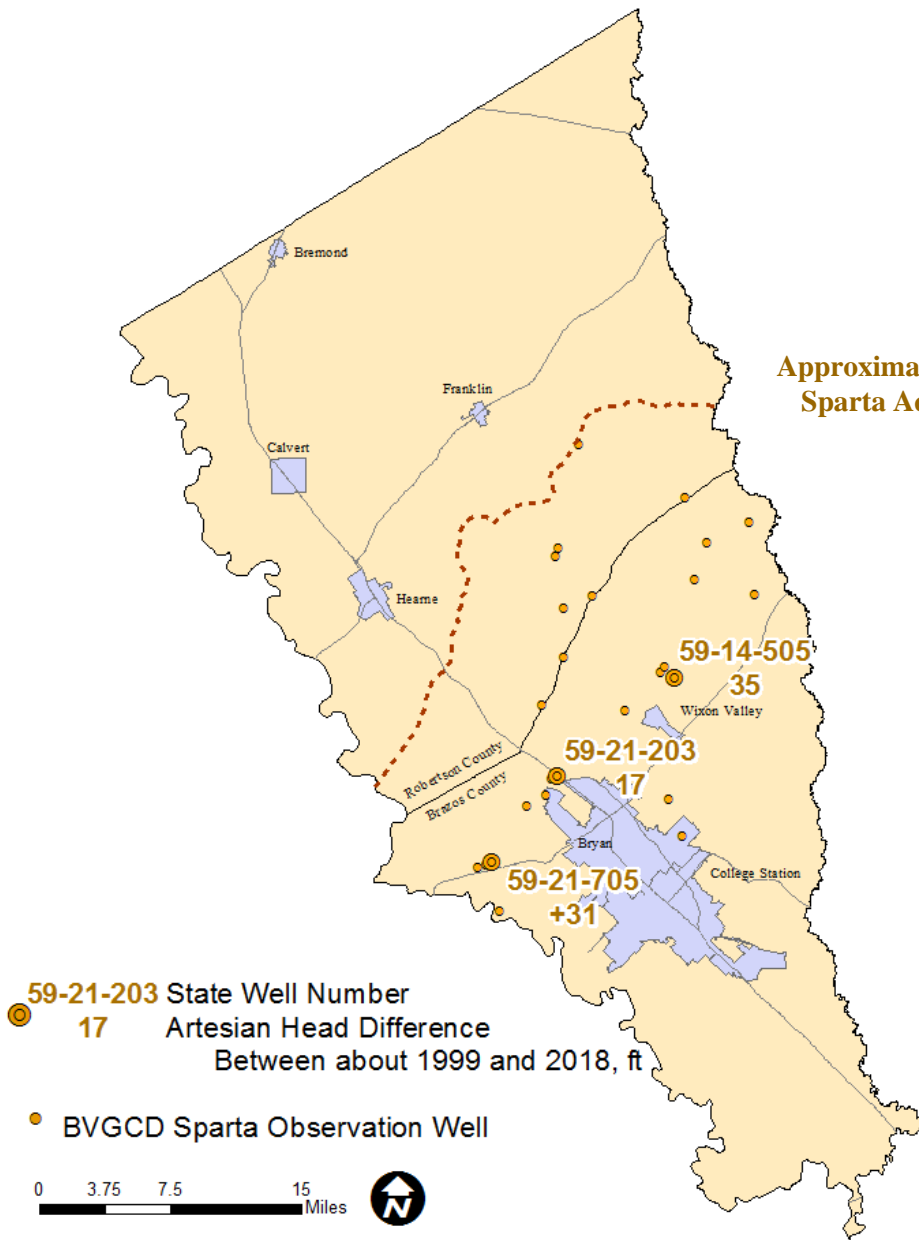
# DFC Goals

Aquifer	GMA 12 DFC, ft	BVGCD- DFC, ft	Period
Sparta	16	12	2000 - Dec. 2069
Queen City	16	12	2000 - Dec. 2069
Carrizo	75	61	2000 - Dec. 2069
Calvert Bluff	114	125	2000 - Dec. 2069
Simsboro	228	295	2000 - Dec. 2069
Hooper	168	207	2000 - Dec. 2069
Yegua	65	70	2010 - 2069
Jackson	65	110	2010 - 2069

# Sparta Aquifer

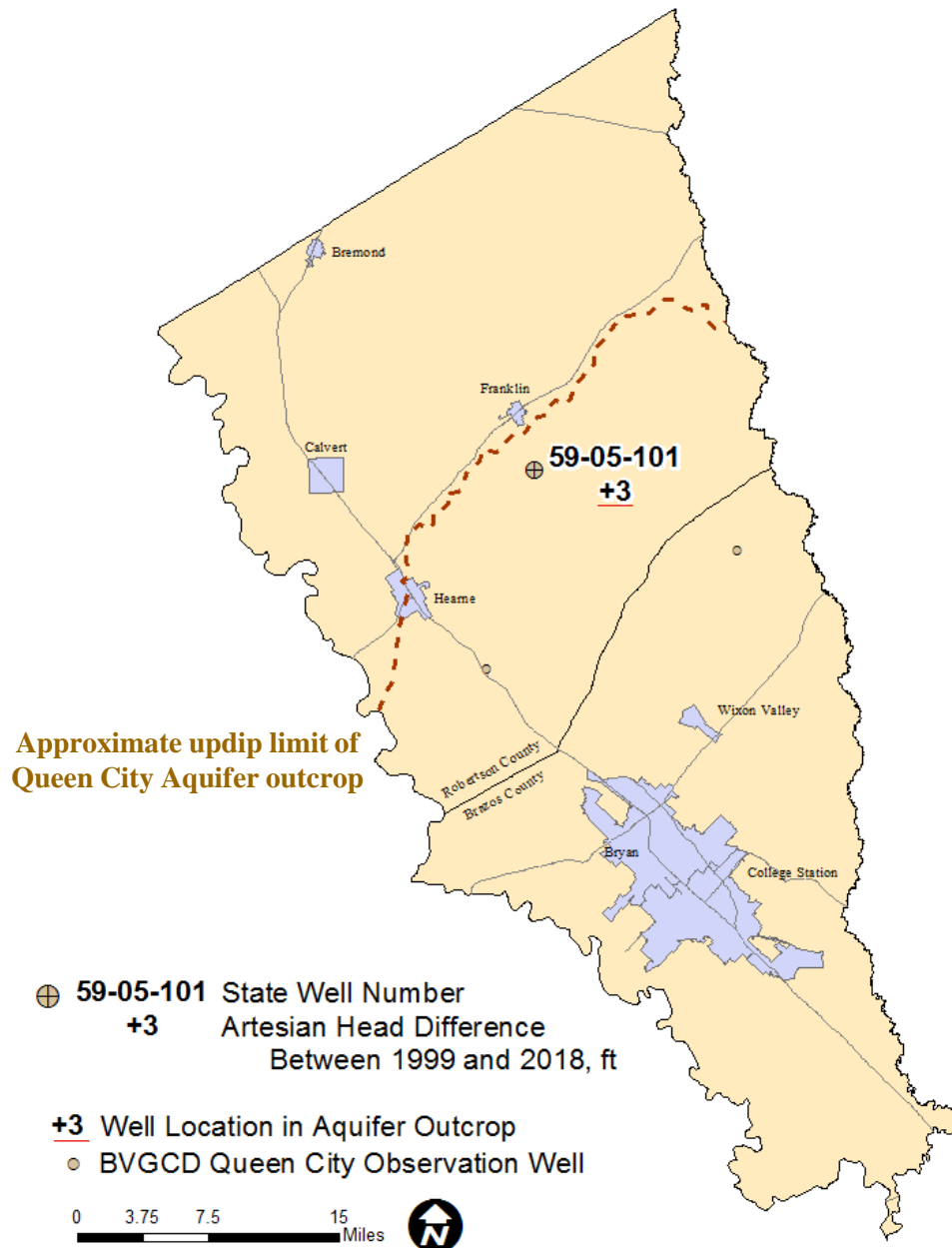
Average Artesian Head Decline = 7 feet

DFC by 2070: Average Artesian Head Decline 12 feet



# Queen City Aquifer

DFC by 2070: Average Artesian Head Decline 12 feet

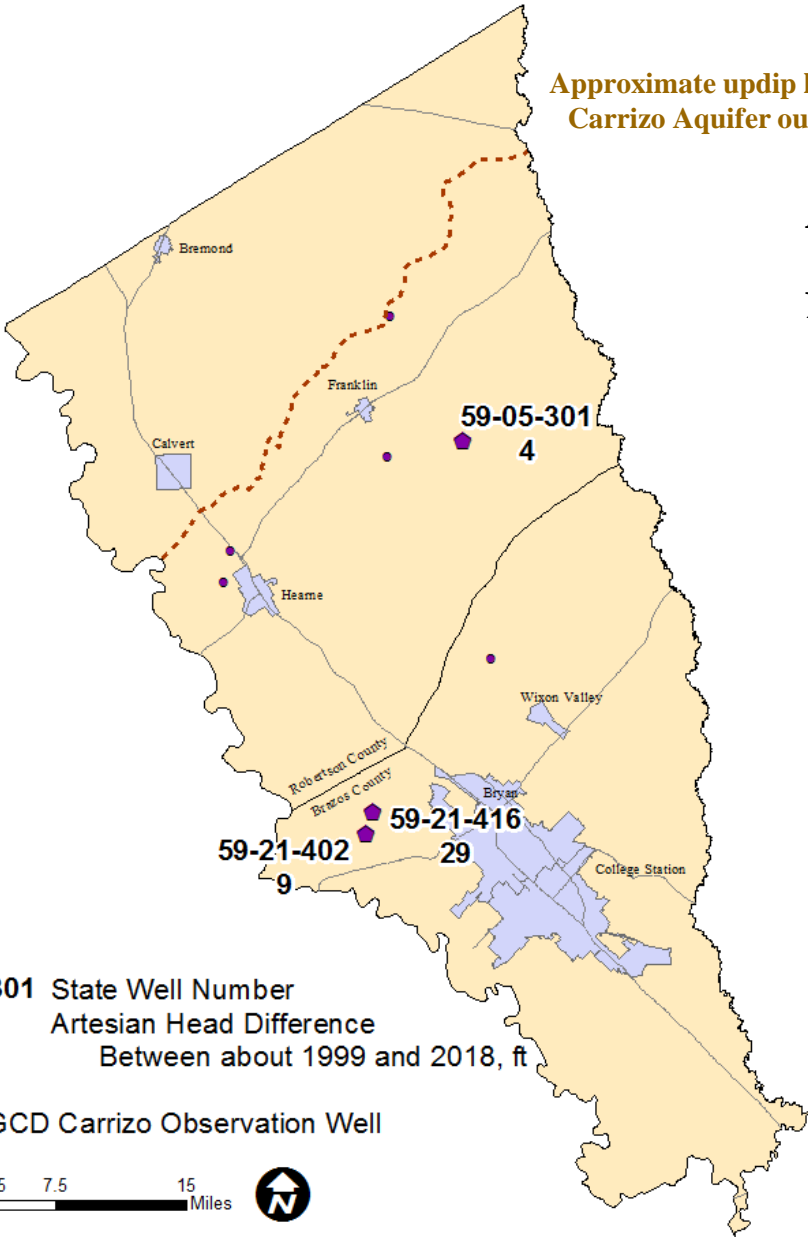


# Carrizo Aquifer

Approximate updip limit of Carrizo Aquifer outcrop

Average Artesian Head Decline = 14 feet

DFC by 2070: Average Artesian Head Decline 61 feet



- ◆ 59-05-301 State Well Number  
4 Artesian Head Difference  
Between about 1999 and 2018, ft
- BVGCD Carrizo Observation Well





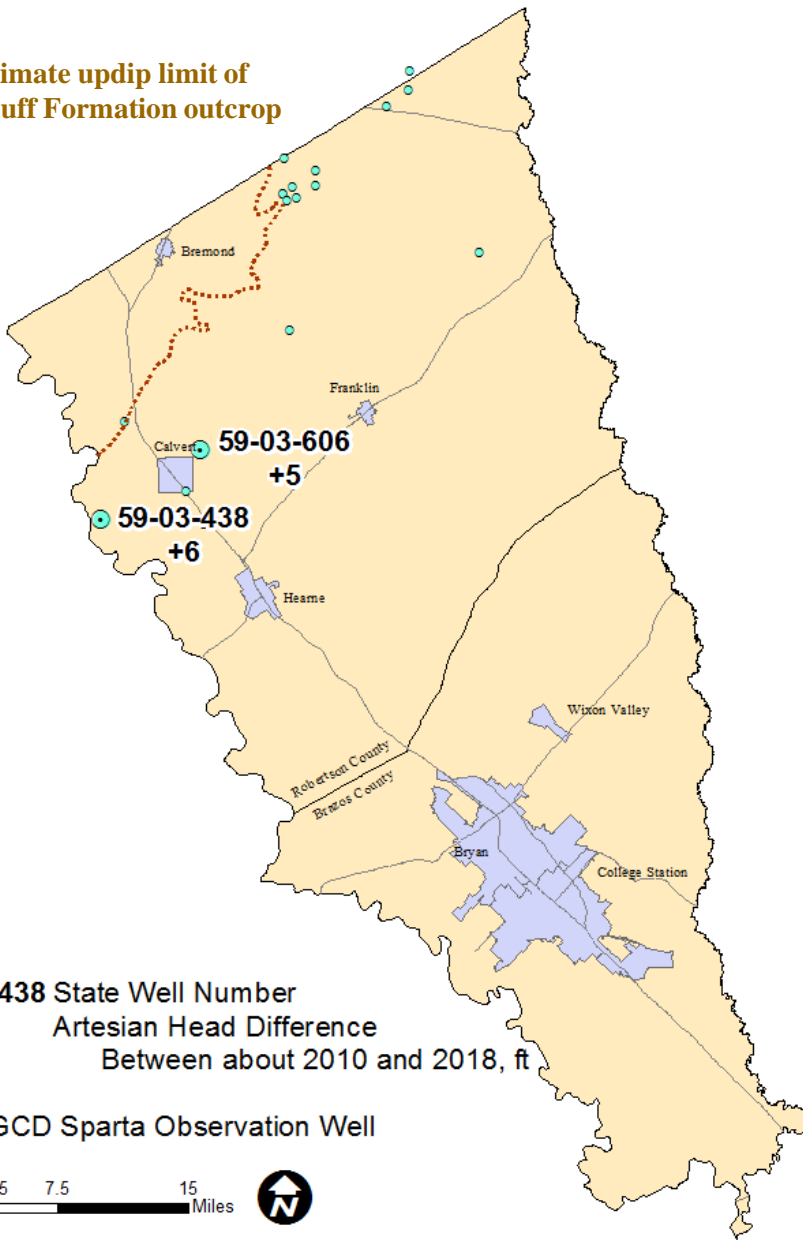
Approximate updip limit of  
Calvert Bluff Formation outcrop

# Calvert Bluff Formation

DFC by 2070: Average Artesian Head Decline 125 feet

59-03-438 State Well Number  
+6 Artesian Head Difference  
Between about 2010 and 2018, ft

BVGCD Sparta Observation Well

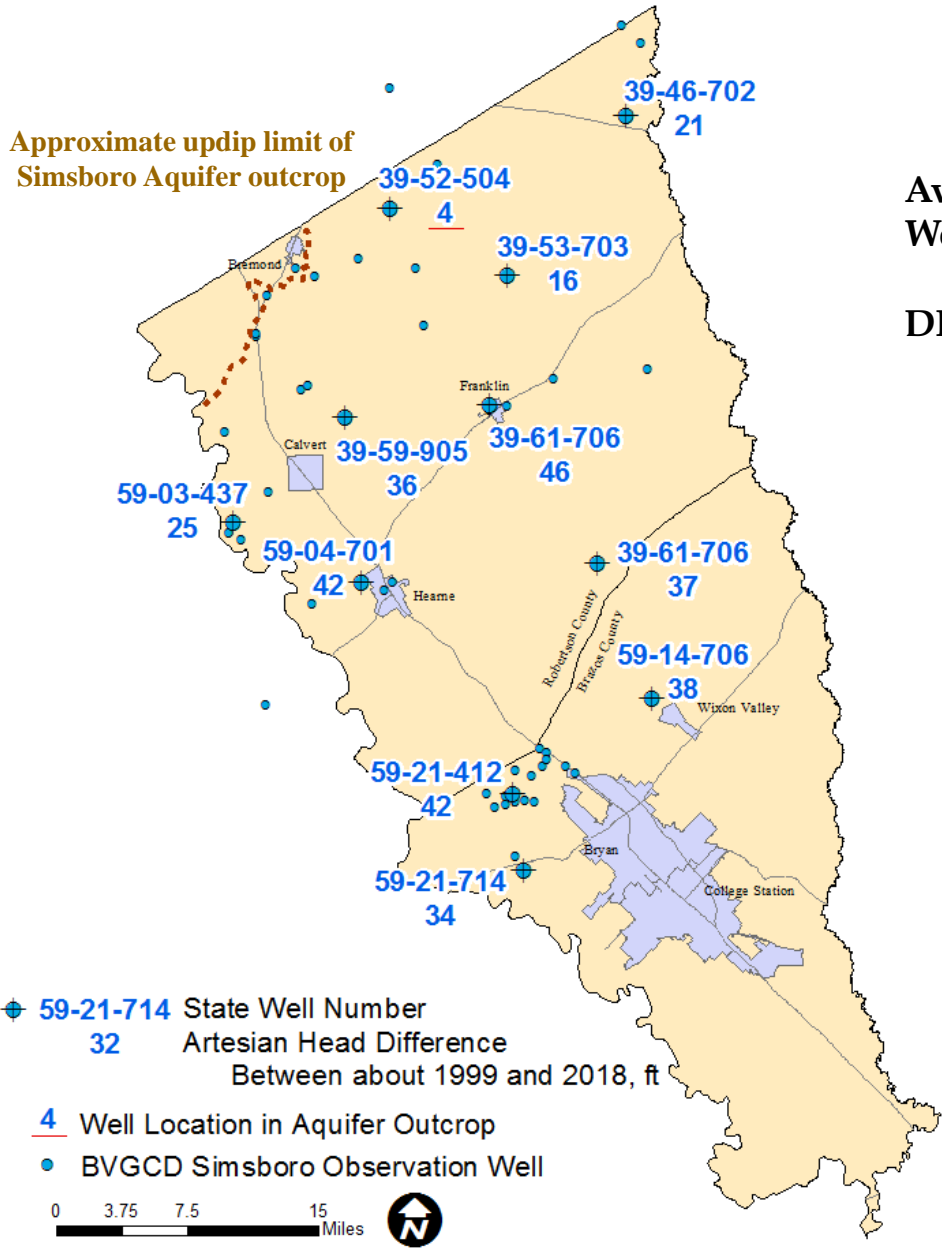


# Simsboro Aquifer

Average Artesian Head Decline = 31 feet  
 Weighted Average Artesian Head Decline = 32 feet

DFC by 2070: Average Artesian Head Decline 295 feet

Approximate updip limit of  
 Simsboro Aquifer outcrop



◆ 59-21-714 State Well Number  
 32 Artesian Head Difference  
 Between about 1999 and 2018, ft

4 Well Location in Aquifer Outcrop  
 ● BVGCD Simsboro Observation Well

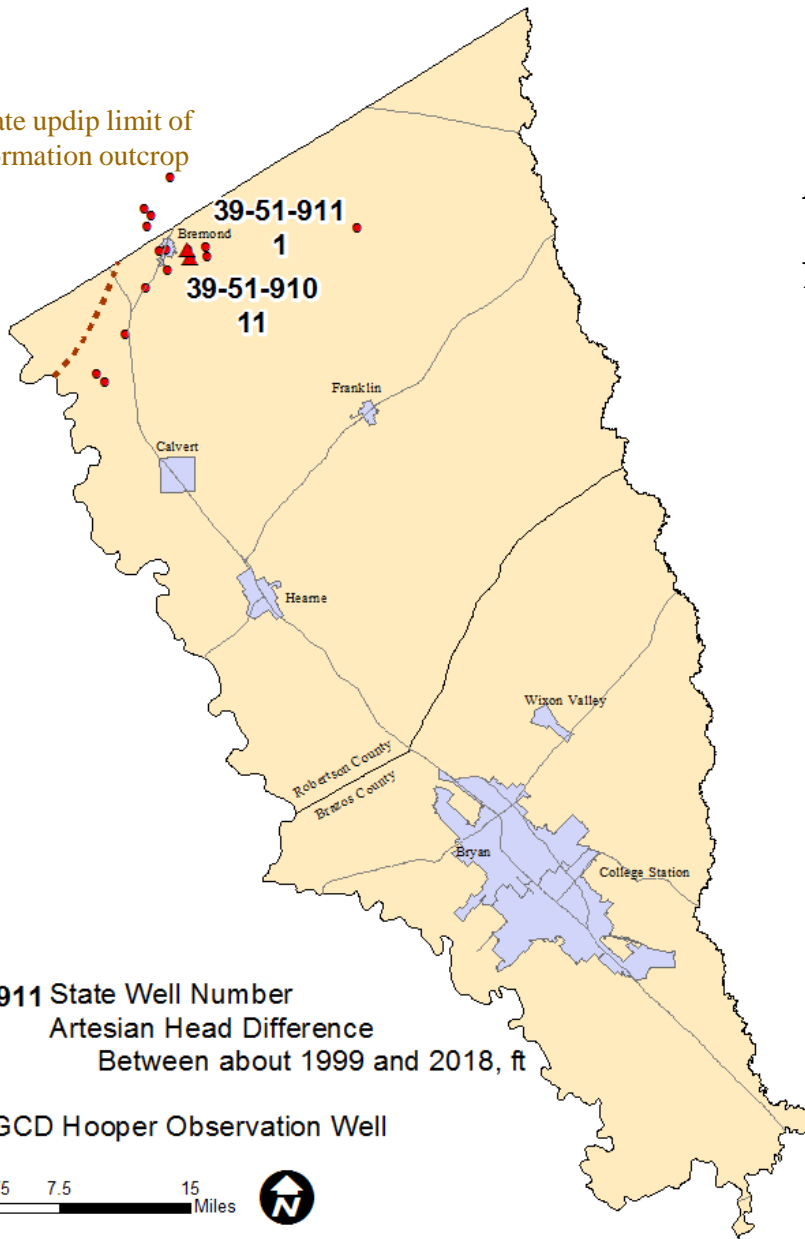


# Hooper Formation

Average Artesian Head Decline = 6 feet

DFC by 2070: Average Artesian Head Decline 207 feet

Approximate updip limit of  
Hooper Formation outcrop



▲ 39-51-911 State Well Number  
1 Artesian Head Difference  
Between about 1999 and 2018, ft

● BVGCD Hooper Observation Well



# Yegua-Jackson Aquifer

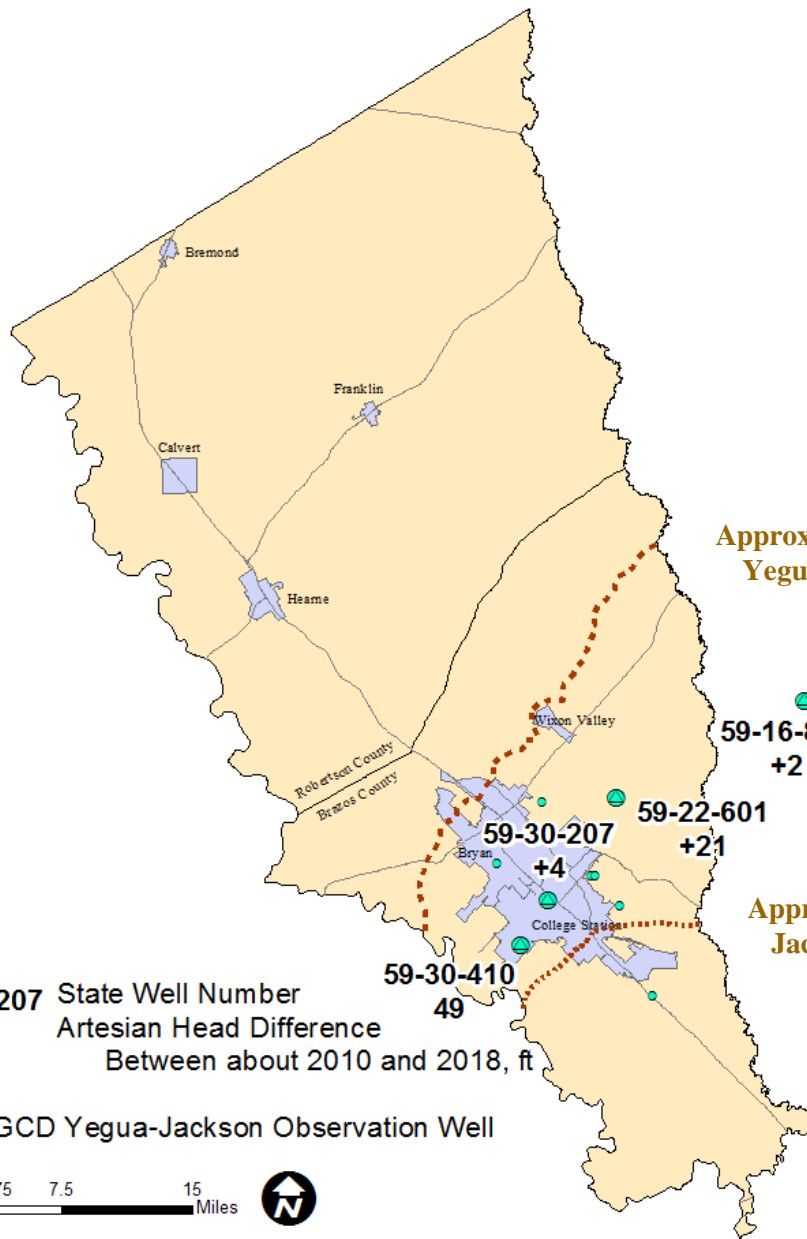
Average Artesian Head Decline = 6 feet

DFC by 2070:

Average Artesian Head Decline 70 feet (Yegua)

DFC by 2070:

Average Artesian Head Decline 110 feet (Jackson)



Approximate updip limit of  
Yegua Aquifer outcrop

Approximate updip limit of  
Jackson Group outcrop

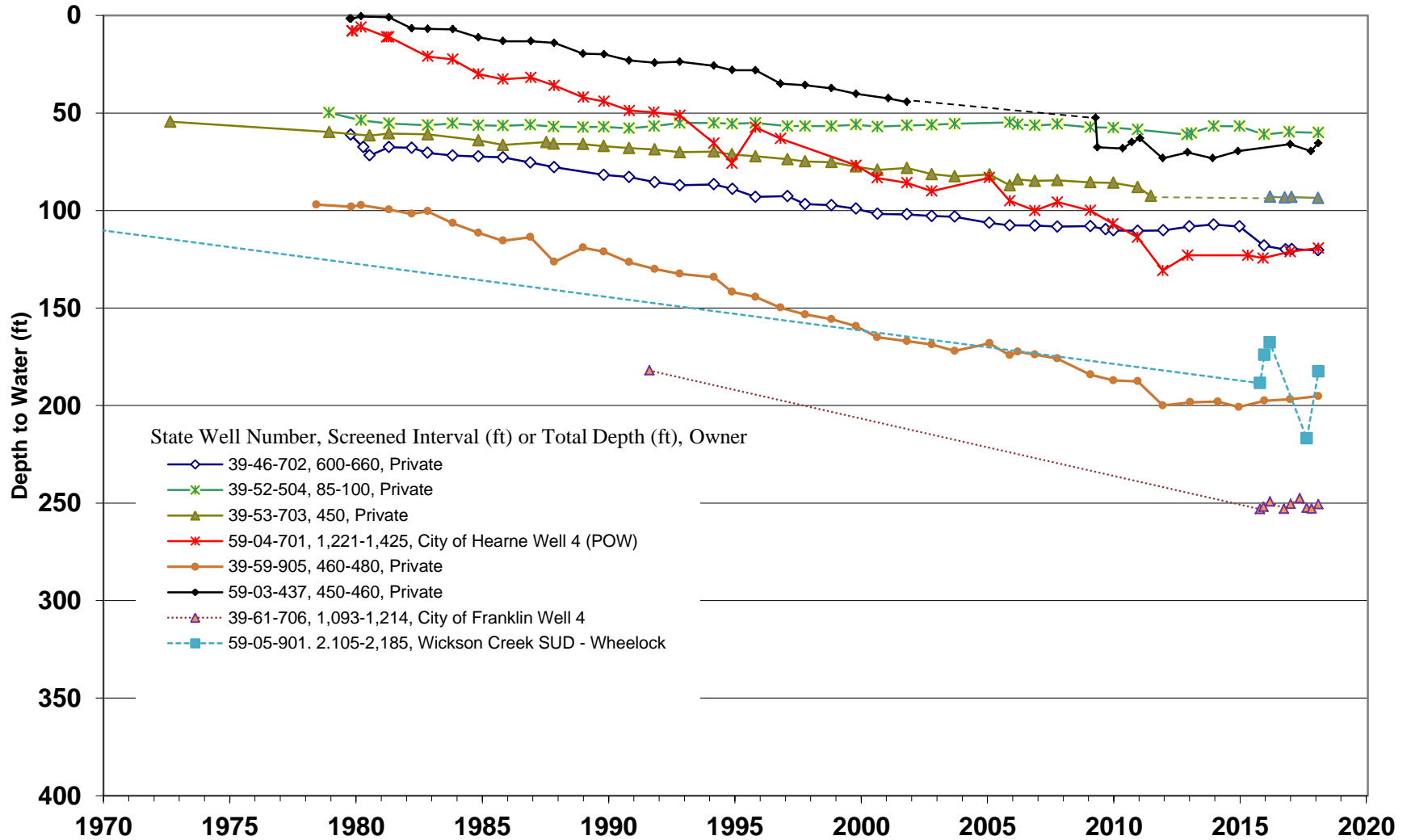
● 59-30-207 State Well Number  
+4 Artesian Head Difference  
Between about 2010 and 2018, ft

● BVGCD Yegua-Jackson Observation Well



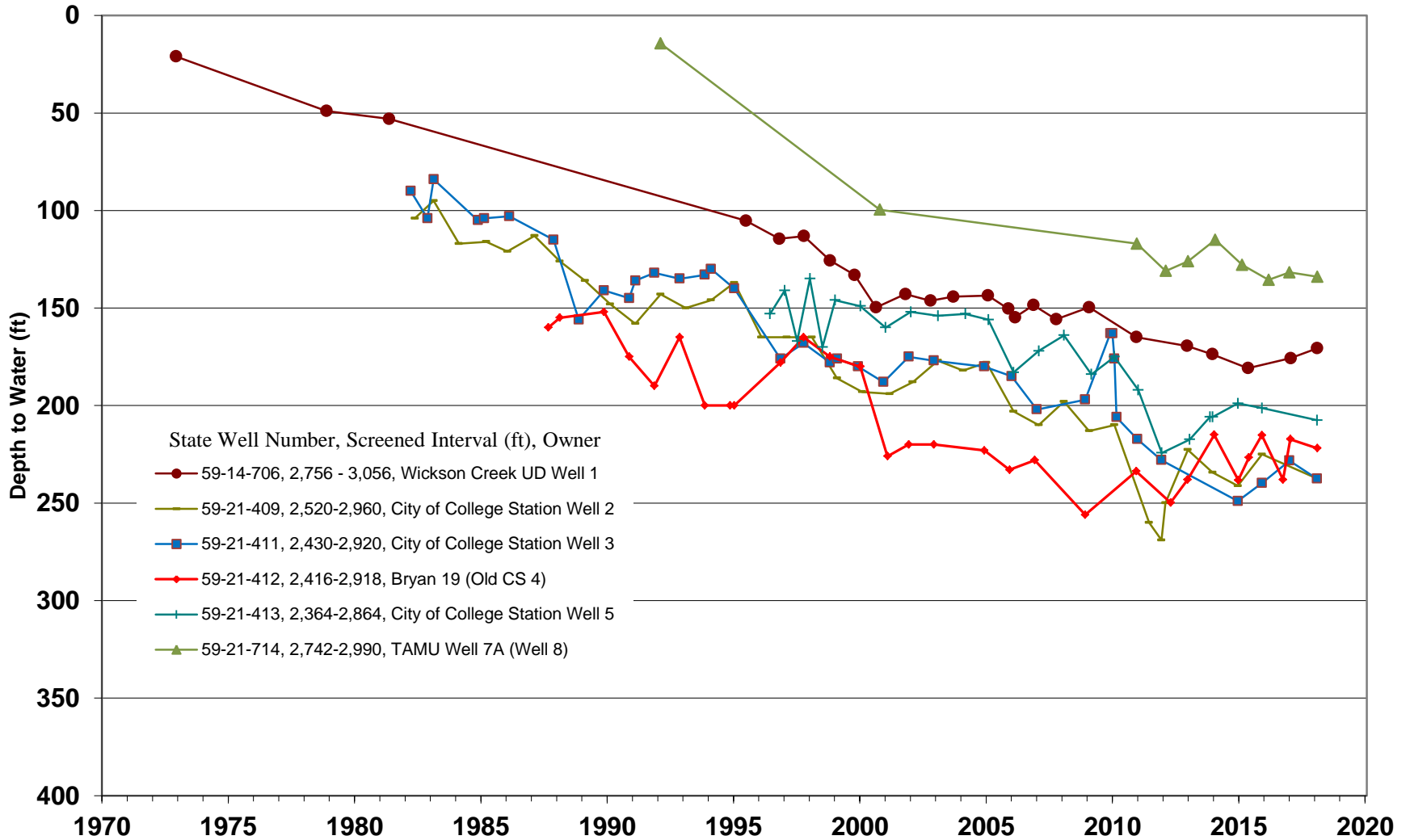
# SIMSBORO AQUIFER OBSERVATION WELLS

## Robertson County

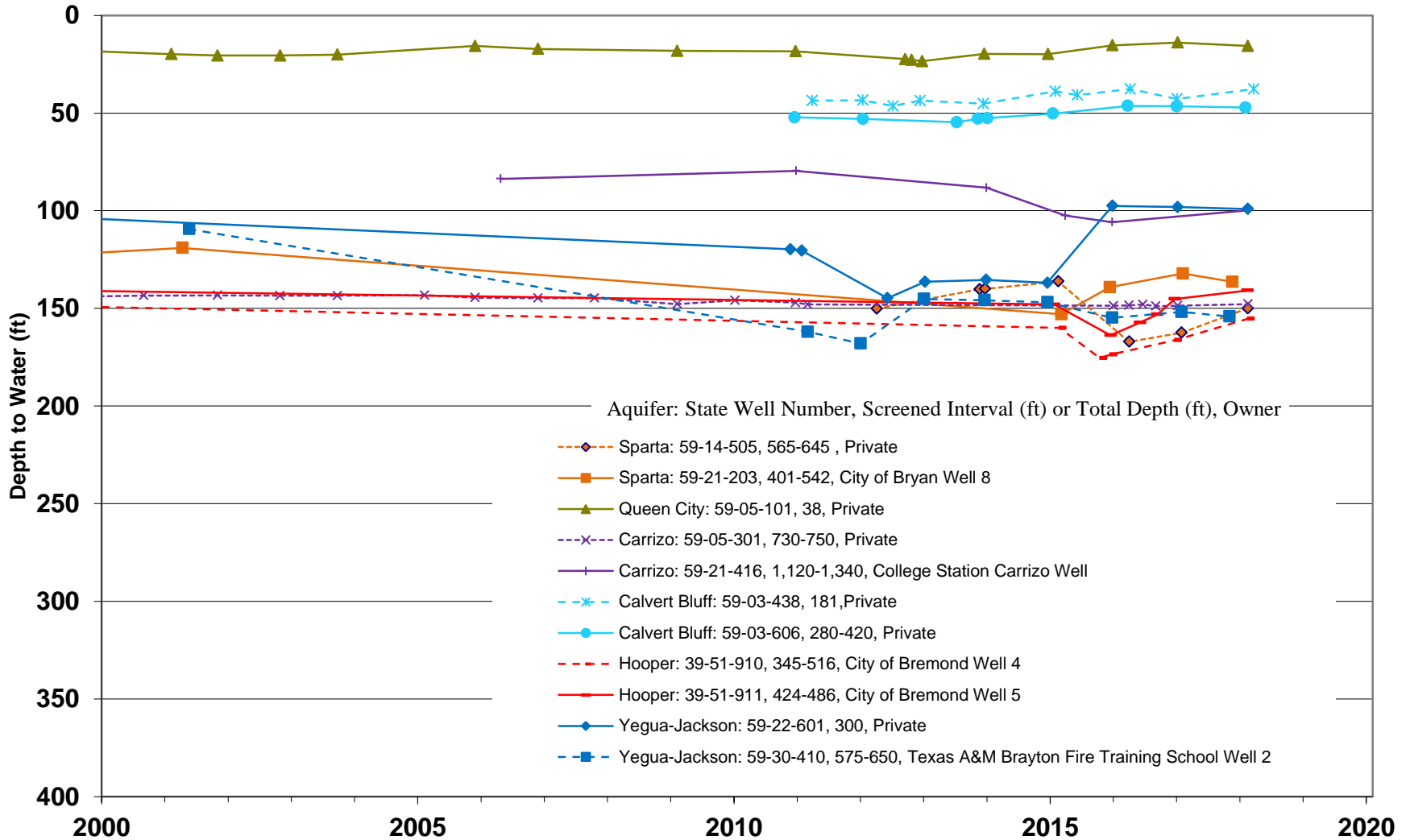


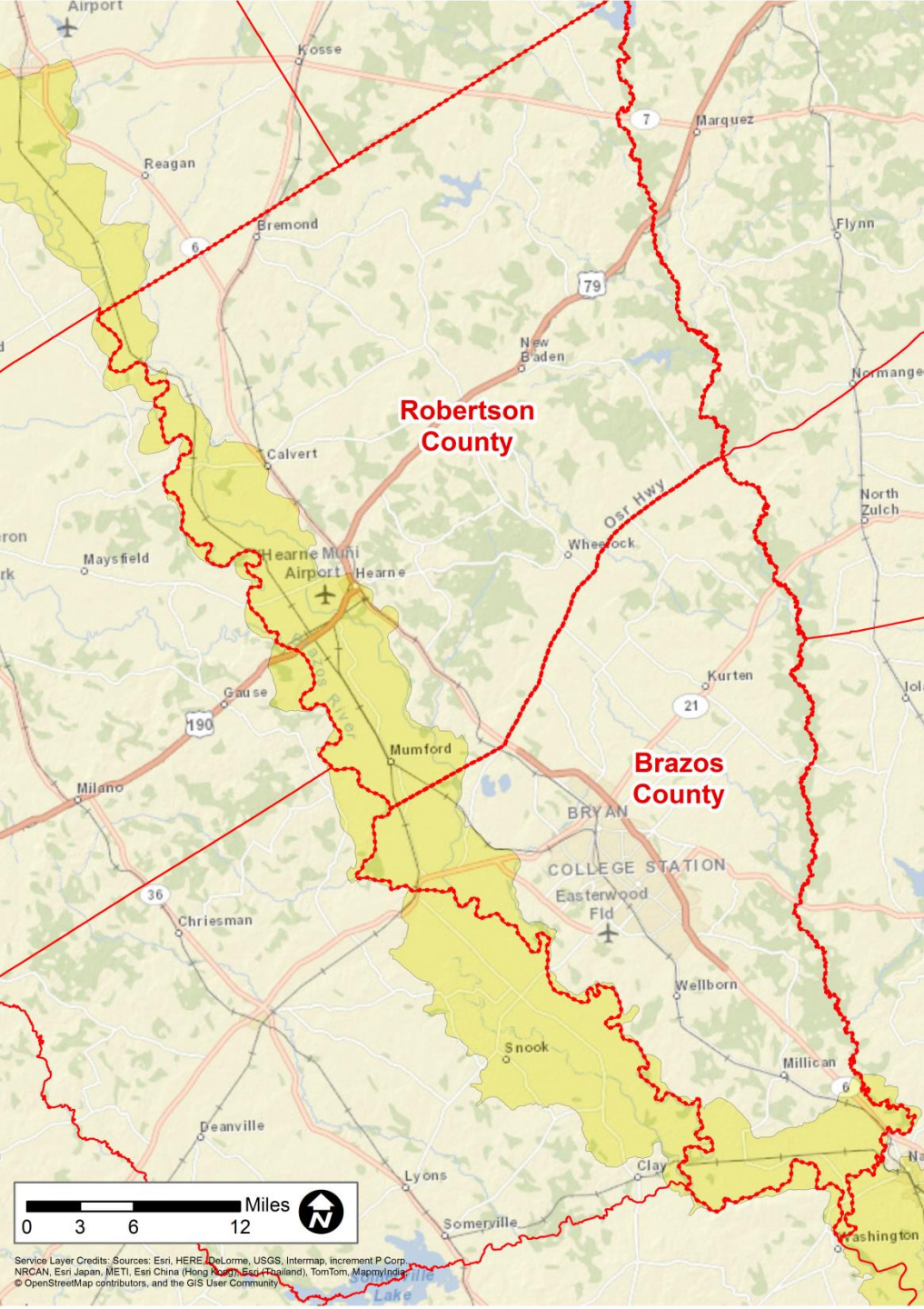
# SIMSBORO AQUIFER OBSERVATION WELLS

## Brazos County



# YEGUA-JACKSON, SPARTA, QUEEN CITY, CARRIZO, CALVERT BLUFF AND HOOPER OBSERVATION WELLS

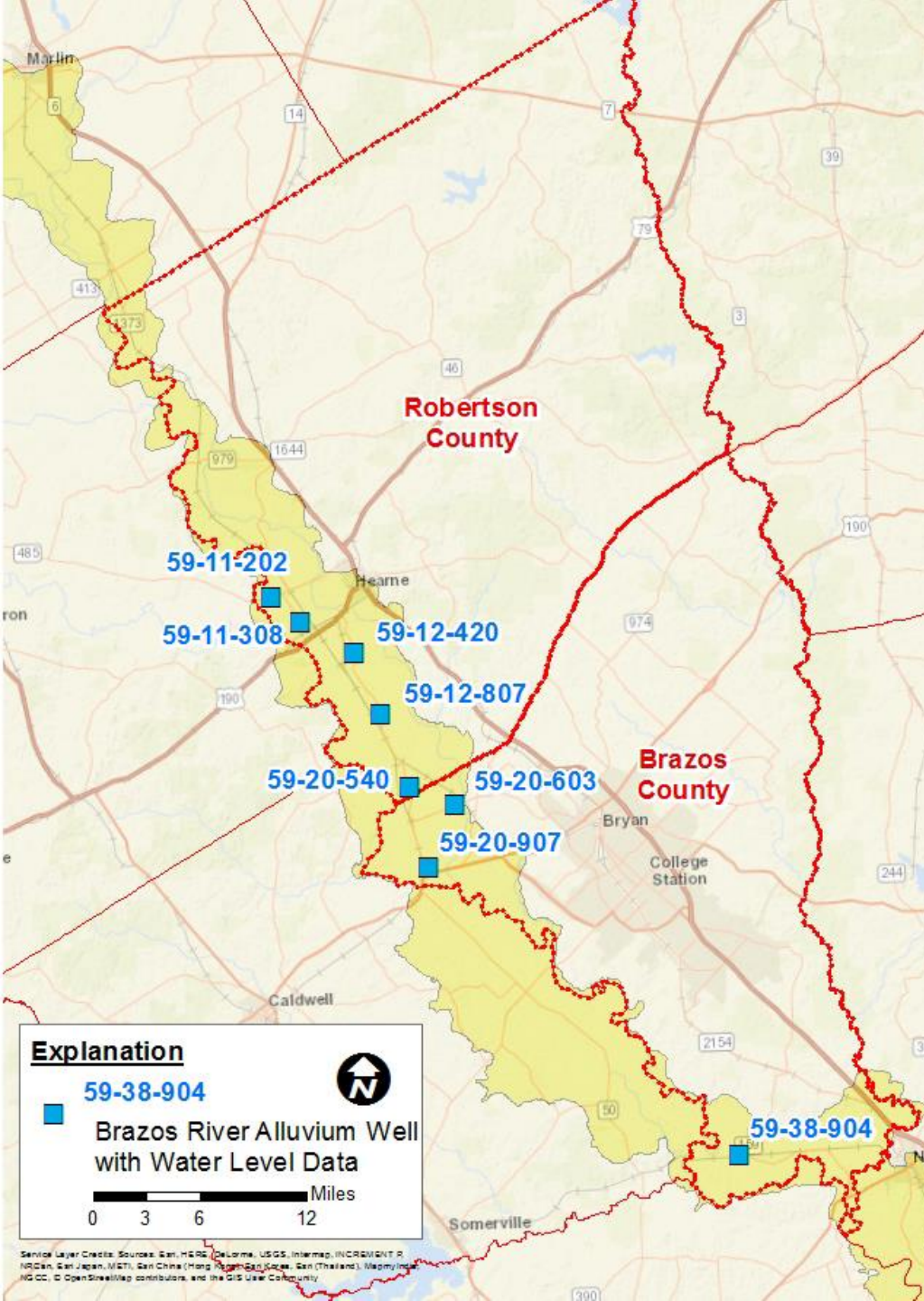




# Extent of Brazos River Alluvium

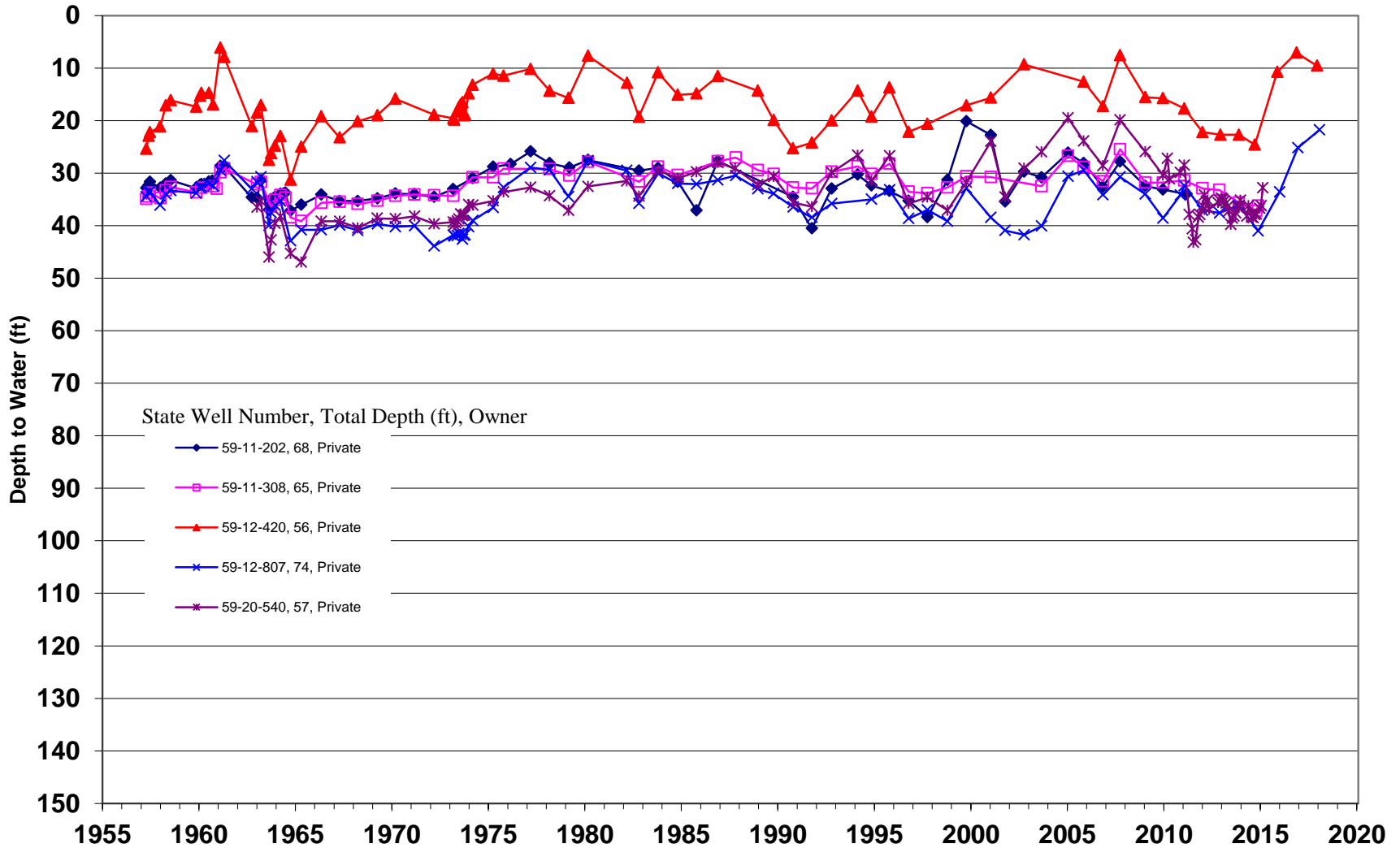


# Location of Brazos River Alluvium Wells With Water Level Hydrographs



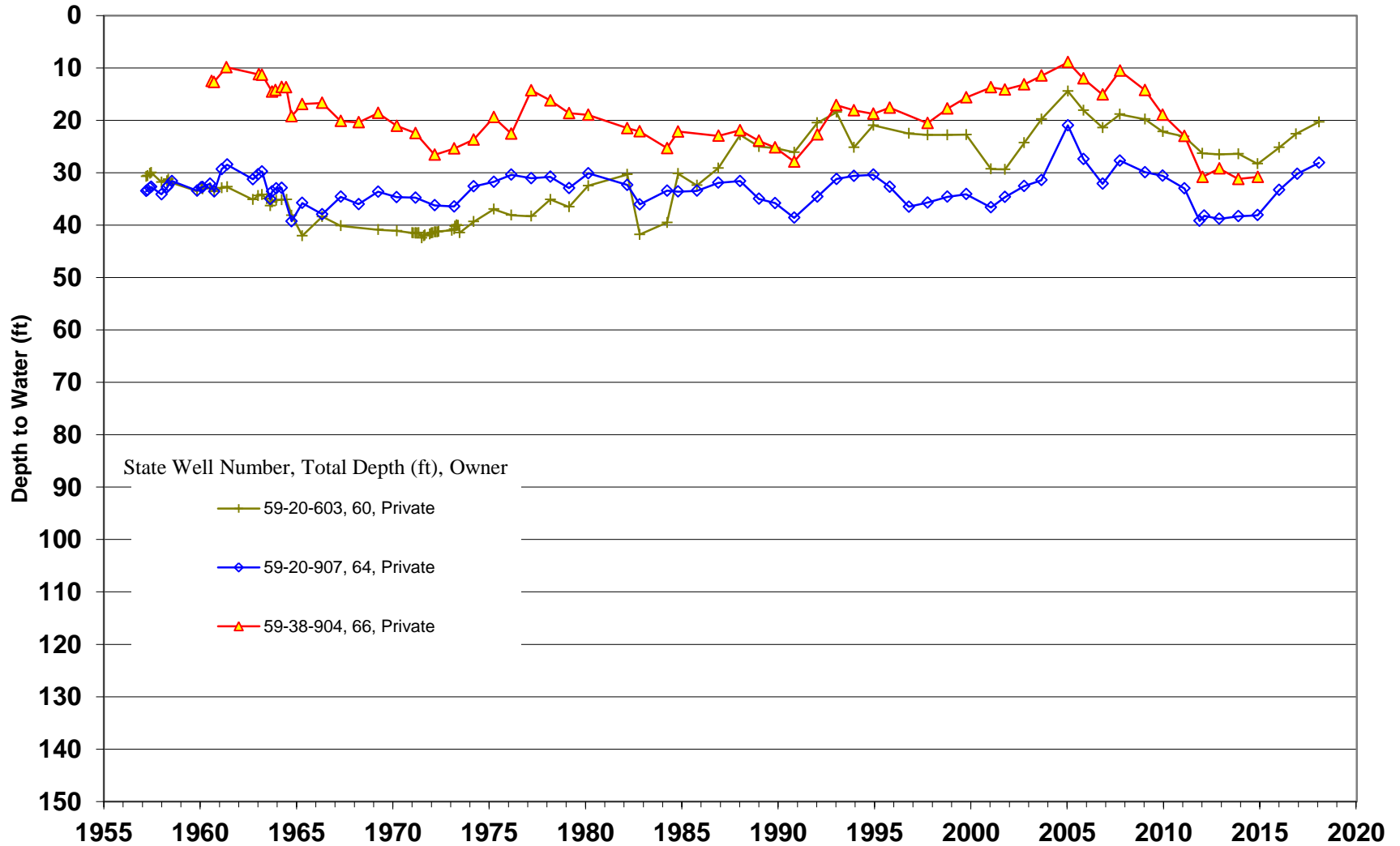
# BRAZOS RIVER ALLUVIUM OBSERVATION WELLS

## Robertson County



# BRAZOS RIVER ALLUVIUM OBSERVATION WELLS

## Brazos County



**P.S. = 30%**

**Robertson  
County**

**P.S. = 30%**

**Brazos  
County**

**Burleson  
County**

**P.S. = 40%**

Irrigation Well Depths  
Range: 45 to 72 feet  
Average ~ 55 to 60 feet

Potential DFC Threshold on  
Allowable Percent Saturation  
P.S.  $\geq$  30% or 40%  
depending on location

Average Irrigation Well Depth  
60 to 65 feet

Average Irrigation Well Depth  
60 to 65 feet

**Brazos River Alluvium  
Well Data**

Irrigation Well



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??Questions??

Thank you!