

Aquifer Desired Future Conditions Update



Presented to
BVGCD Board of Directors
By
WSP USA

April 10, 2018



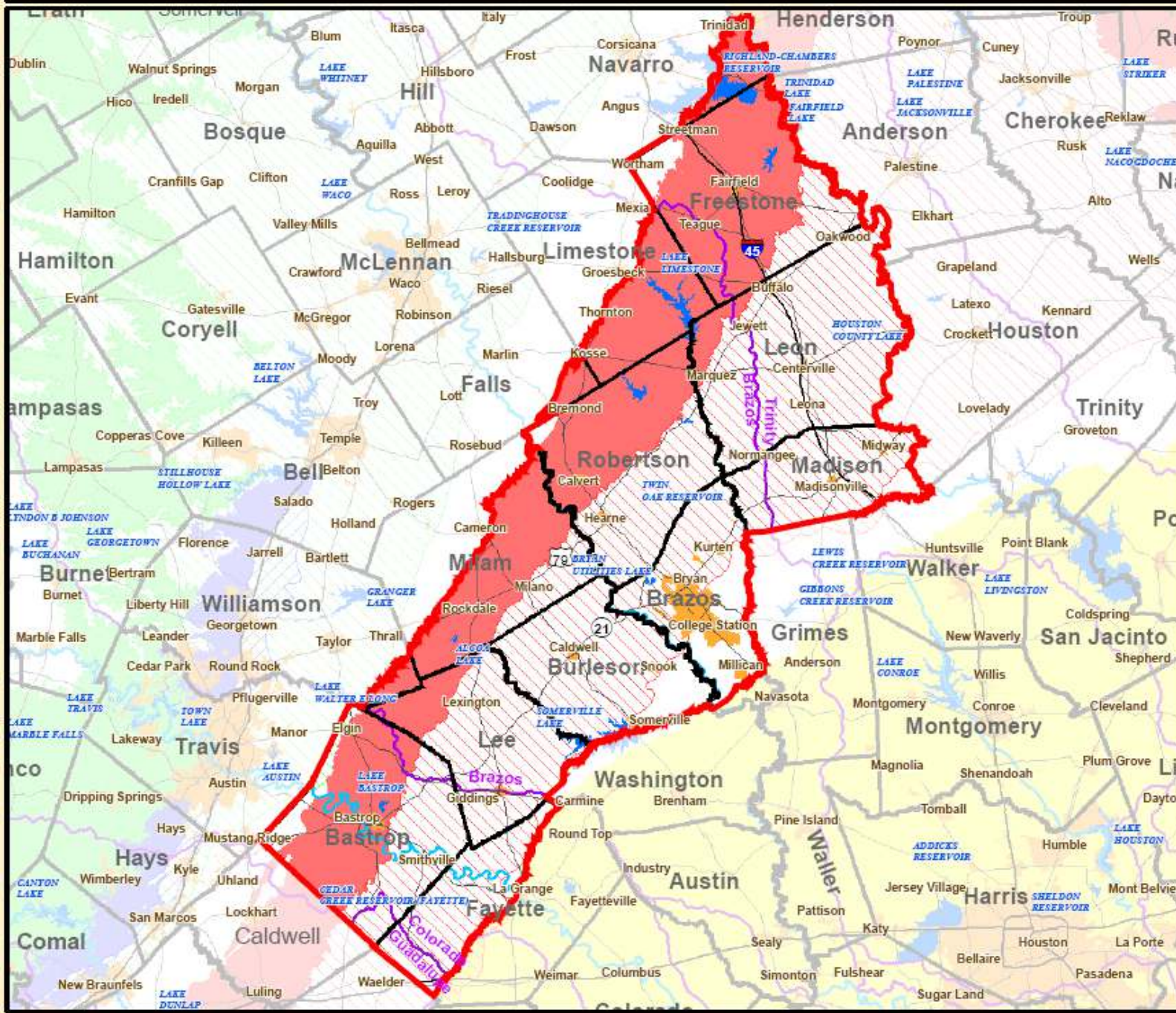
Desired Future Conditions

- ❖ 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
12/21/2005



4/10/2018 4
1 inch equals 26 miles

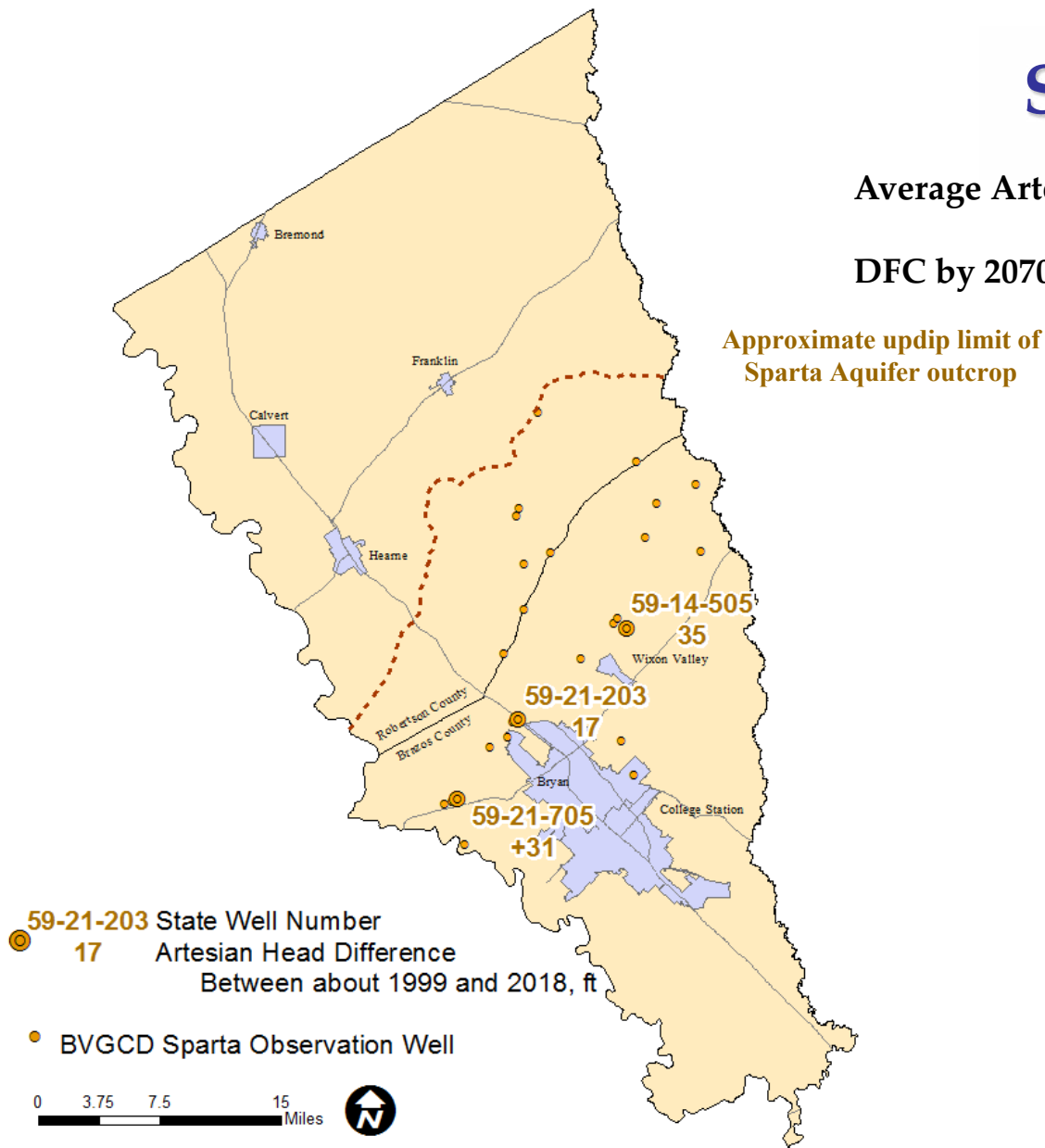
DFC Goals

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

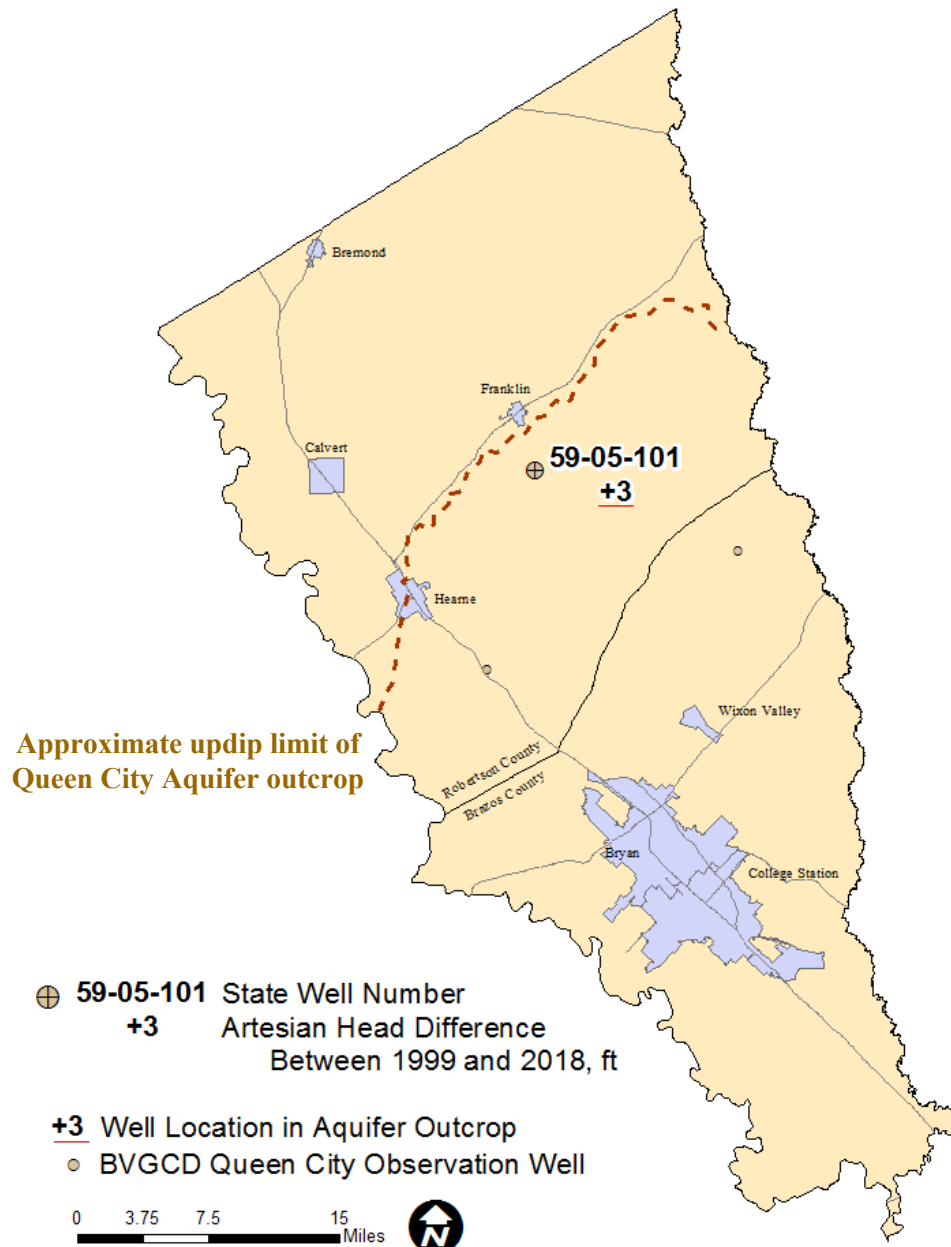
Average Artesian Head Decline = 7 feet

DFC by 2070: Average Artesian Head Decline 12 feet



Queen City Aquifer

DFC by 2070: Average Artesian Head Decline 12 feet

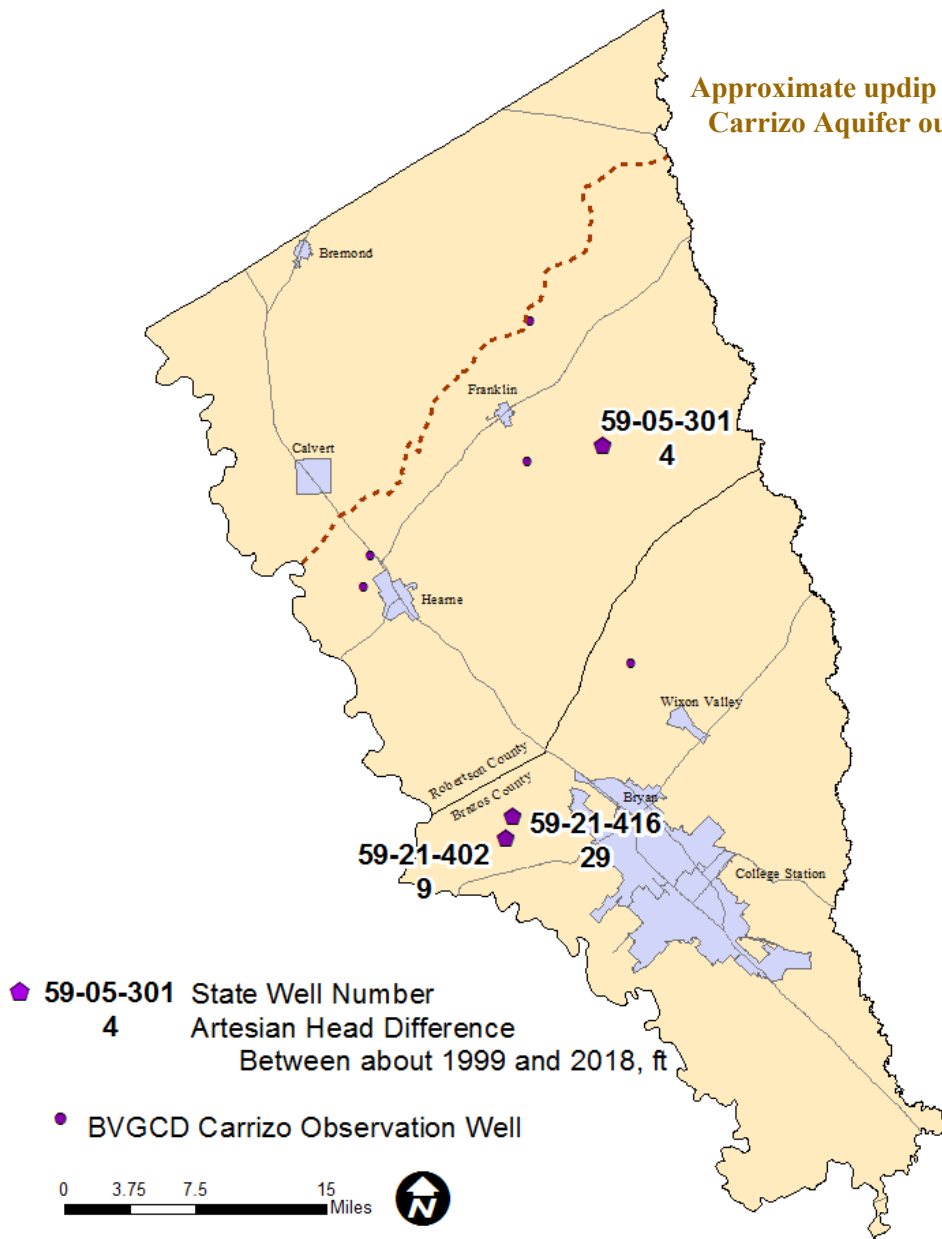


Carrizo Aquifer

Approximate updip limit of
Carrizo Aquifer outcrop

Average Artesian Head Decline = 14 feet

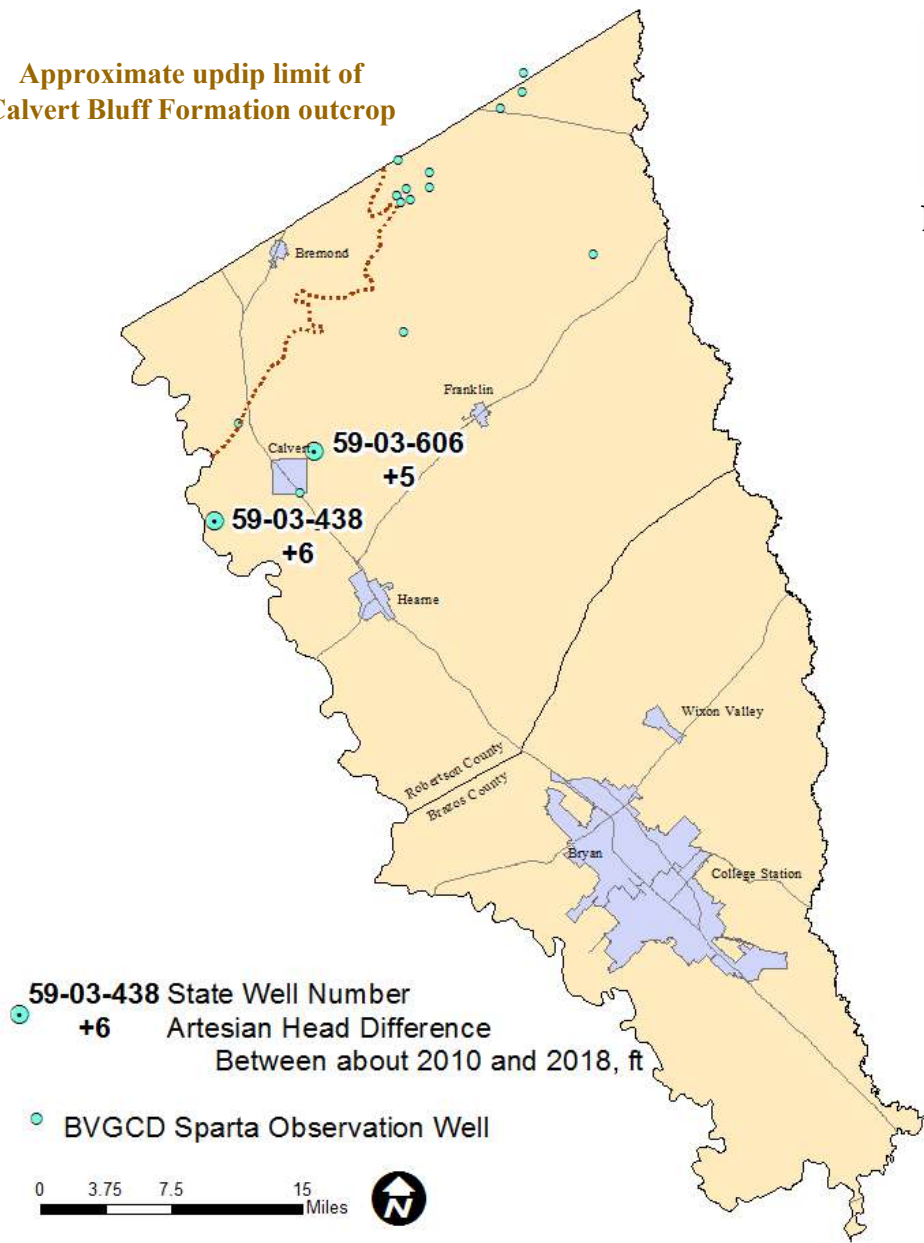
DFC by 2070: Average Artesian Head Decline 61 feet



Approximate updip limit of
Calvert Bluff Formation outcrop

Calvert Bluff Formation

DFC by 2070: Average Artesian Head Decline 125 feet



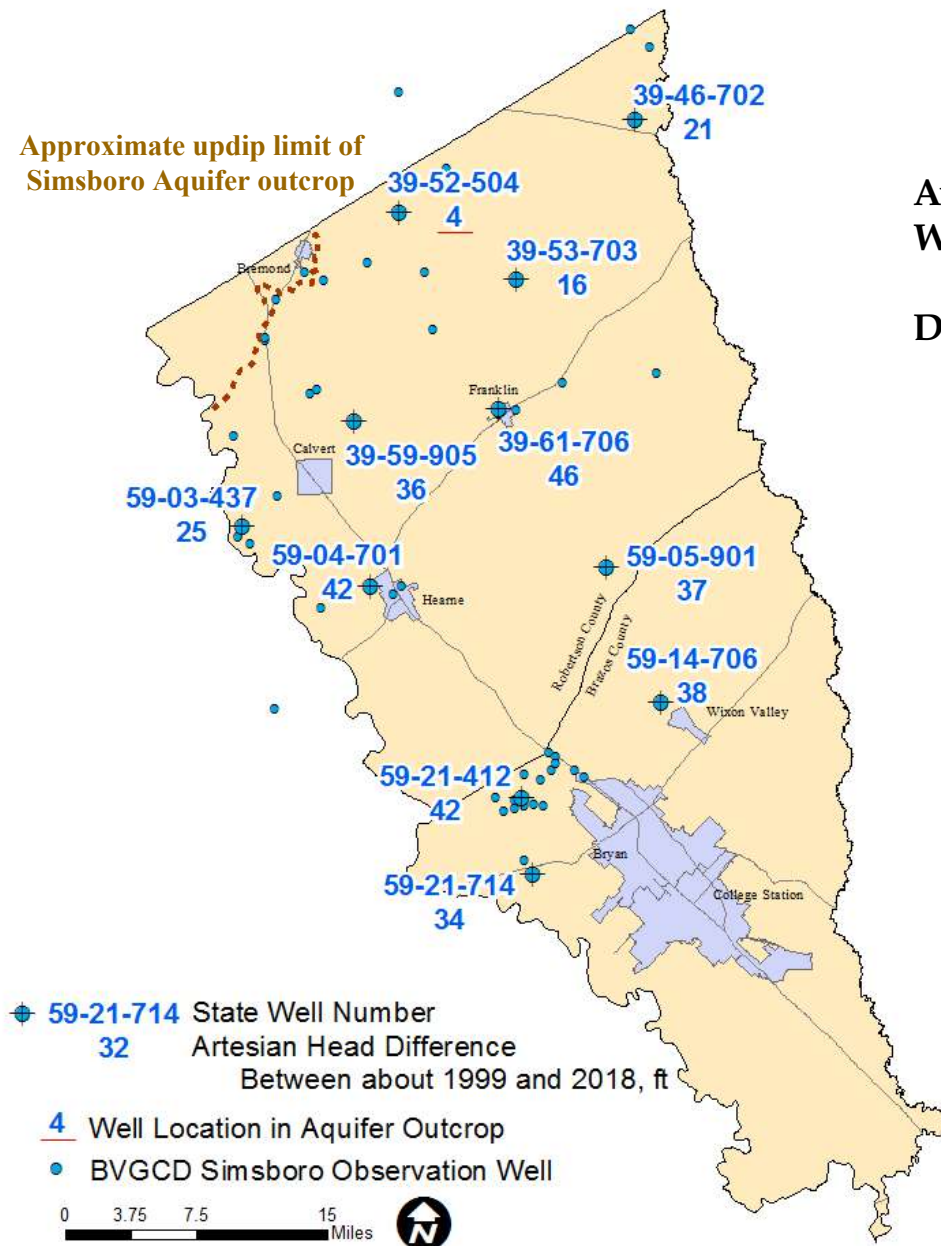
Simsboro Aquifer

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

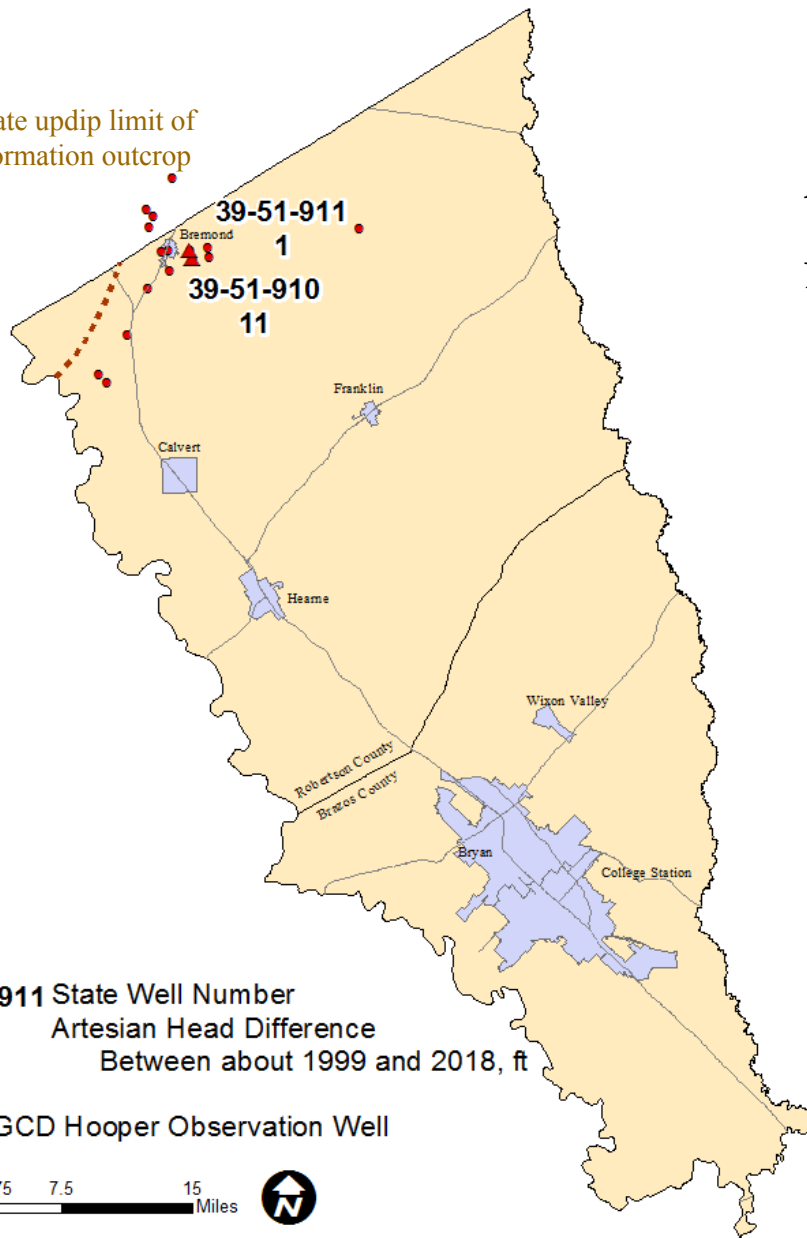


Hooper Formation

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

0 3.75 7.5 15 Miles



Yegua-Jackson Aquifer

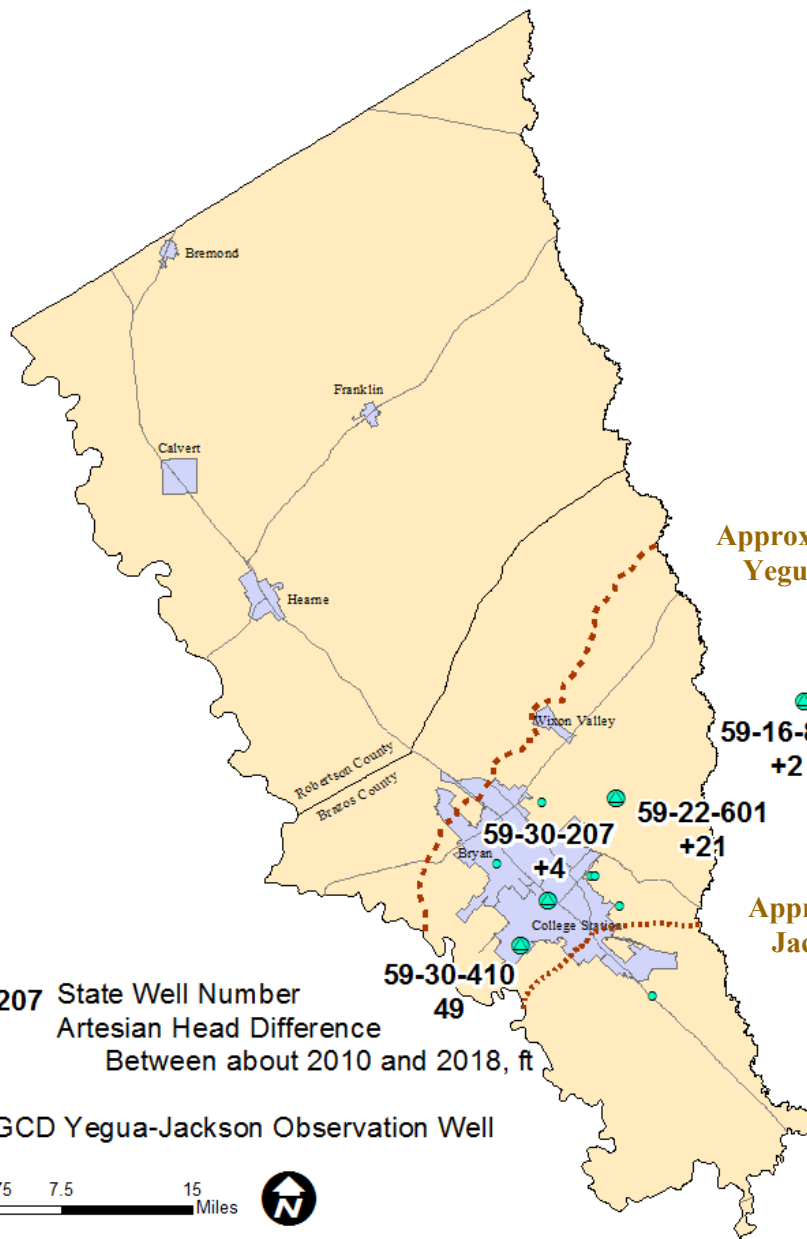
Average Artesian Head Decline = 6 feet

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

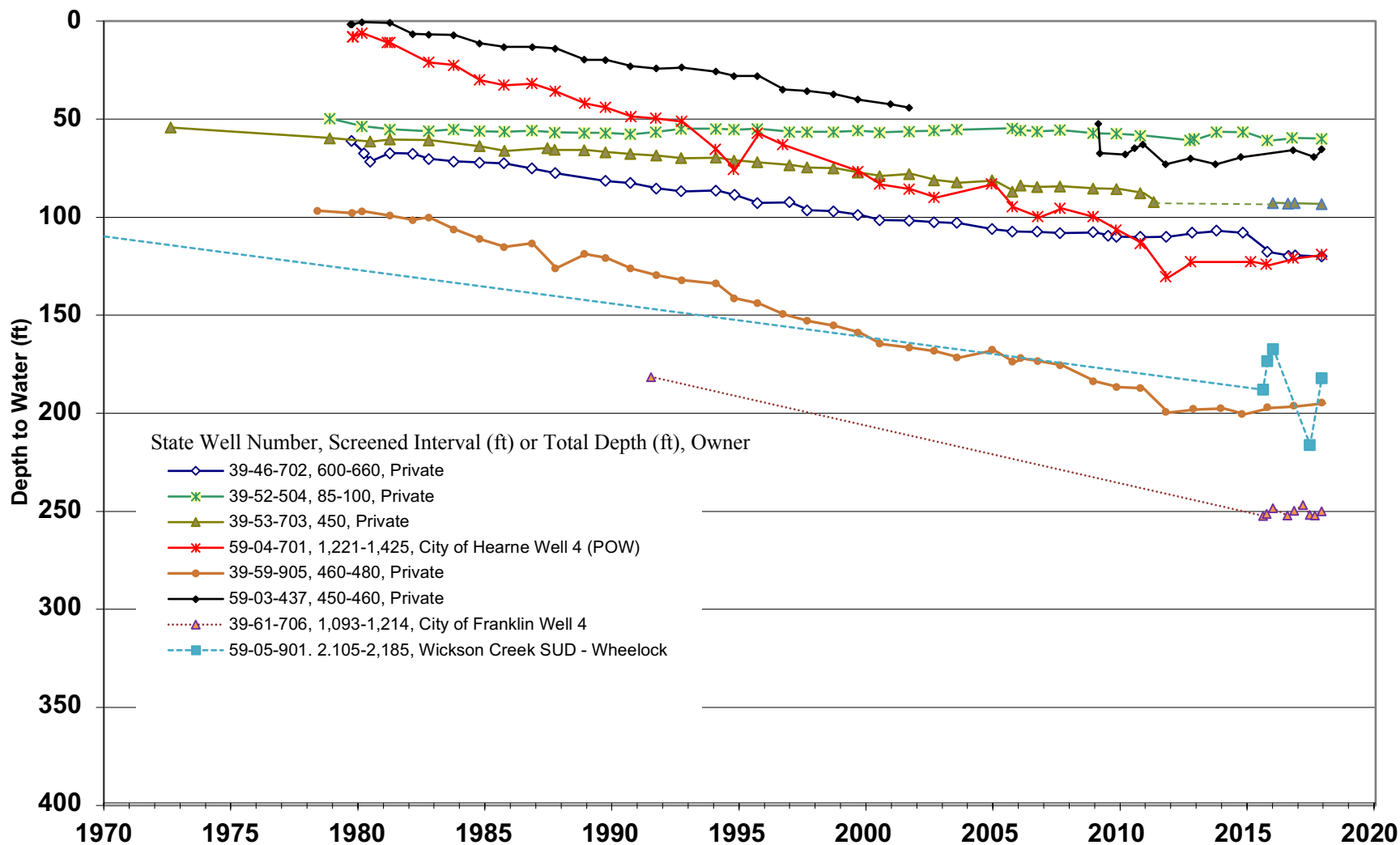
● 59-30-207 State Well Number
+4 Artesian Head Difference
Between about 2010 and 2018, ft

● BVGCD Yegua-Jackson Observation Well



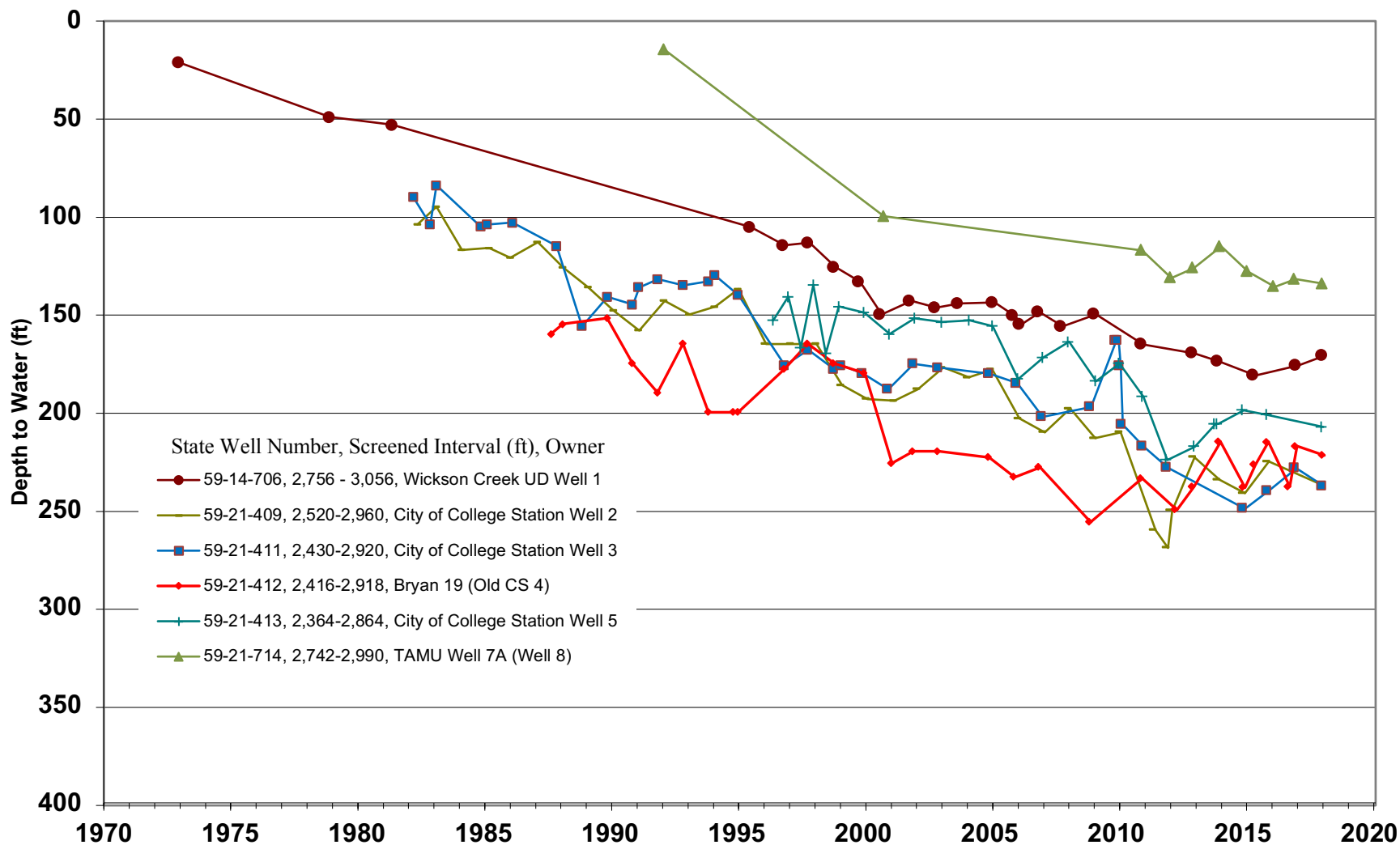
SIMSBORO AQUIFER OBSERVATION WELLS

Robertson County

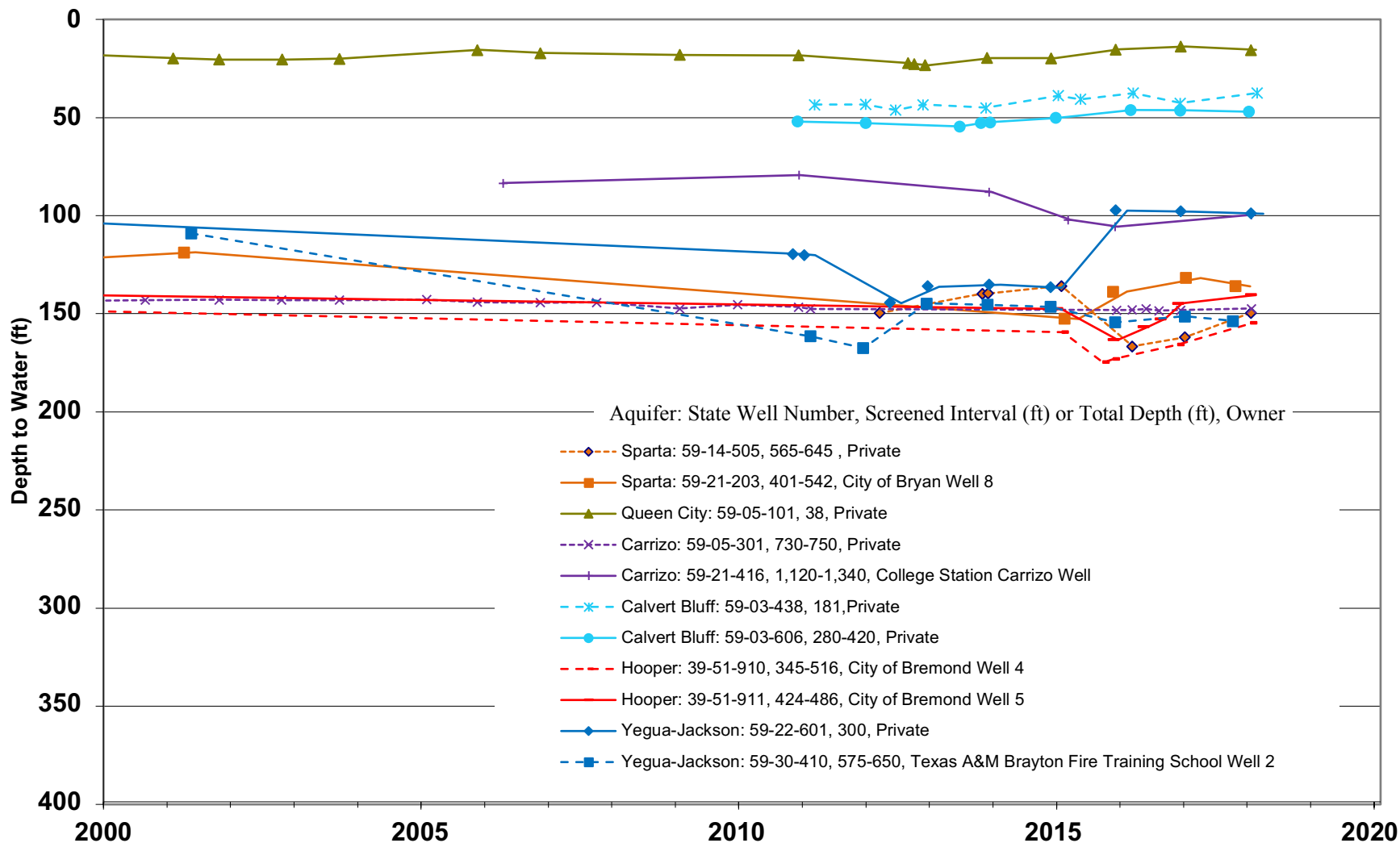


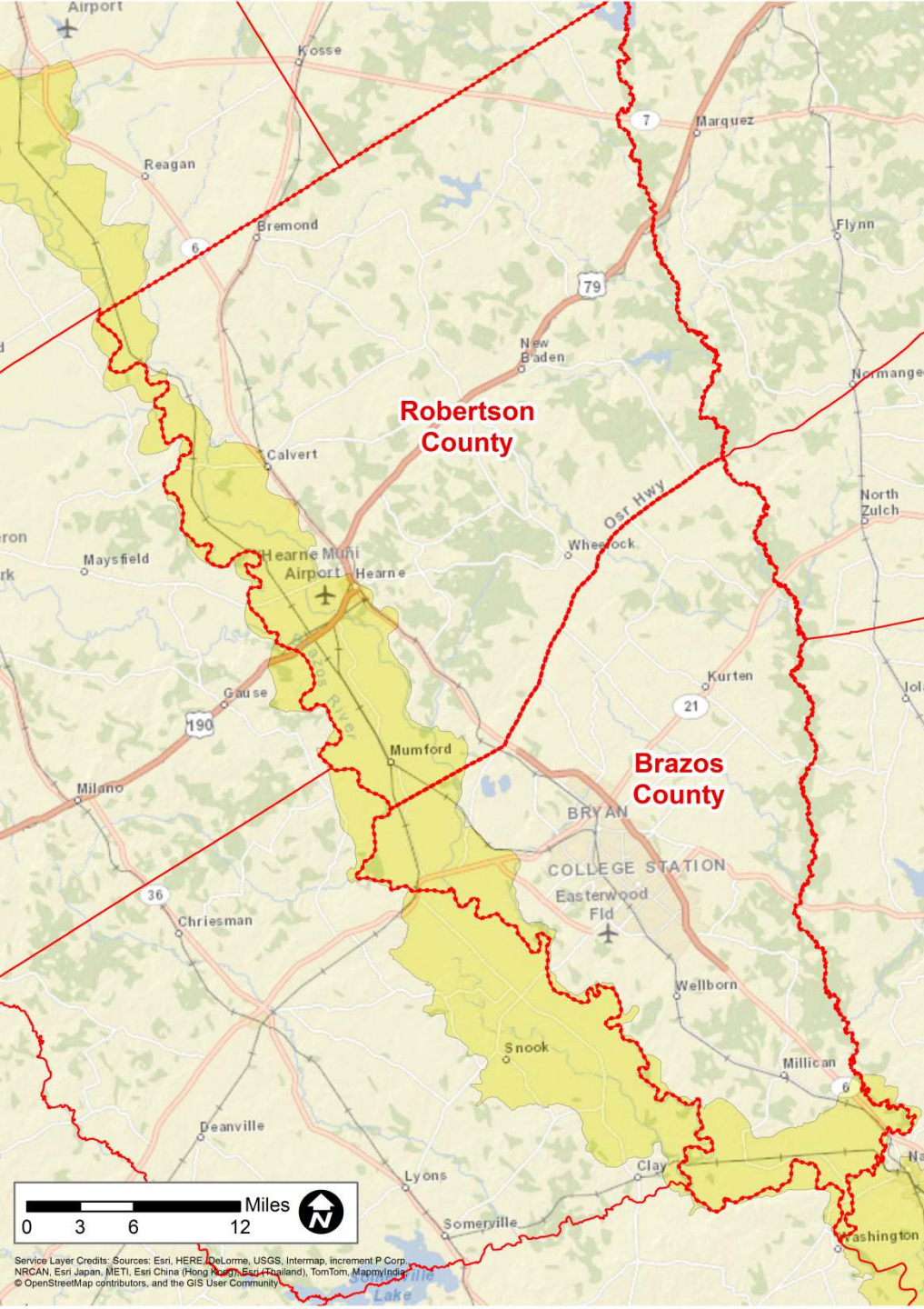
SIMSBORO AQUIFER OBSERVATION WELLS

Brazos County



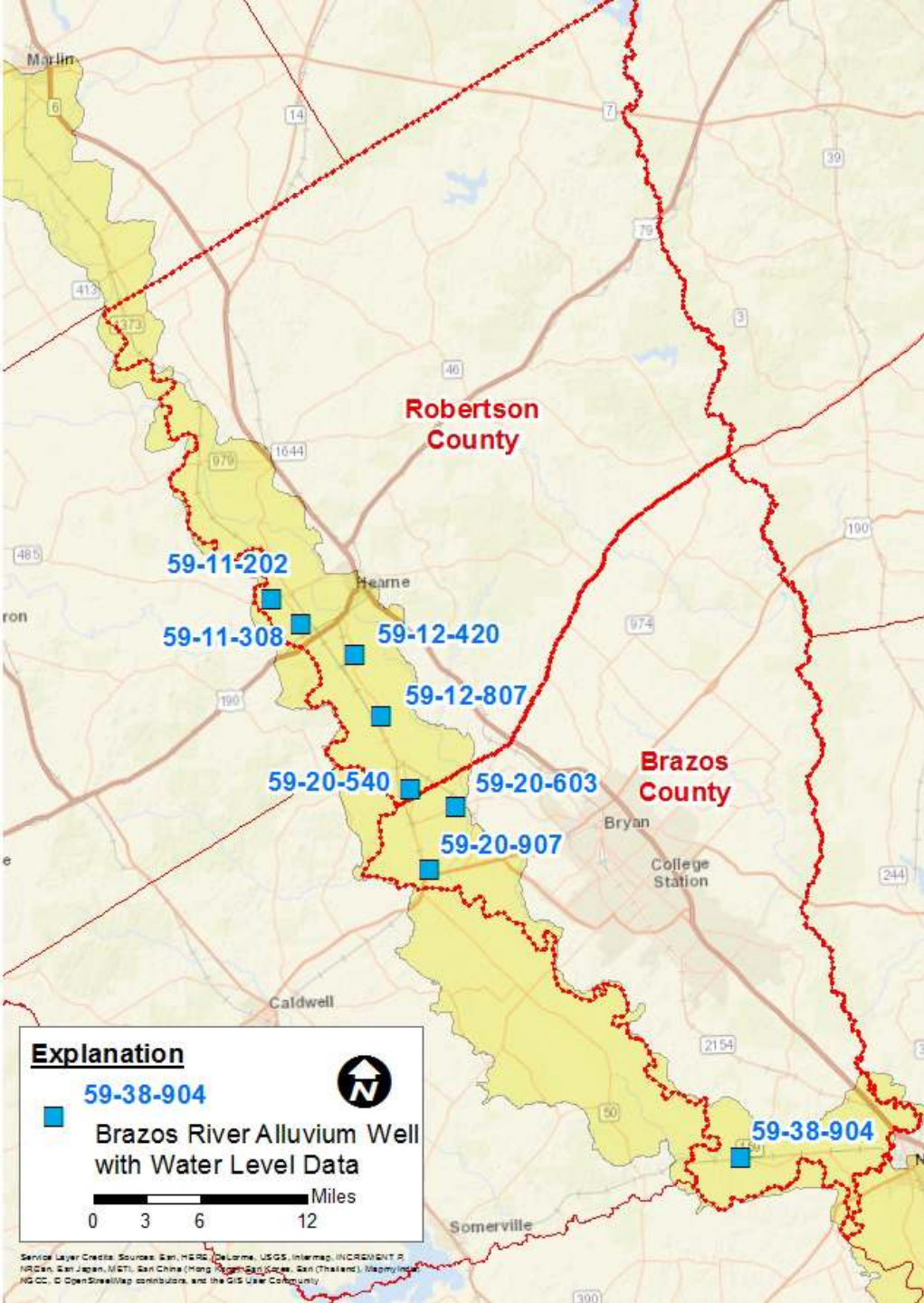
YEGUA-JACKSON, SPARTA, QUEEN CITY, CARRIZO, CALVERT BLUFF AND HOOPER OBSERVATION WELLS



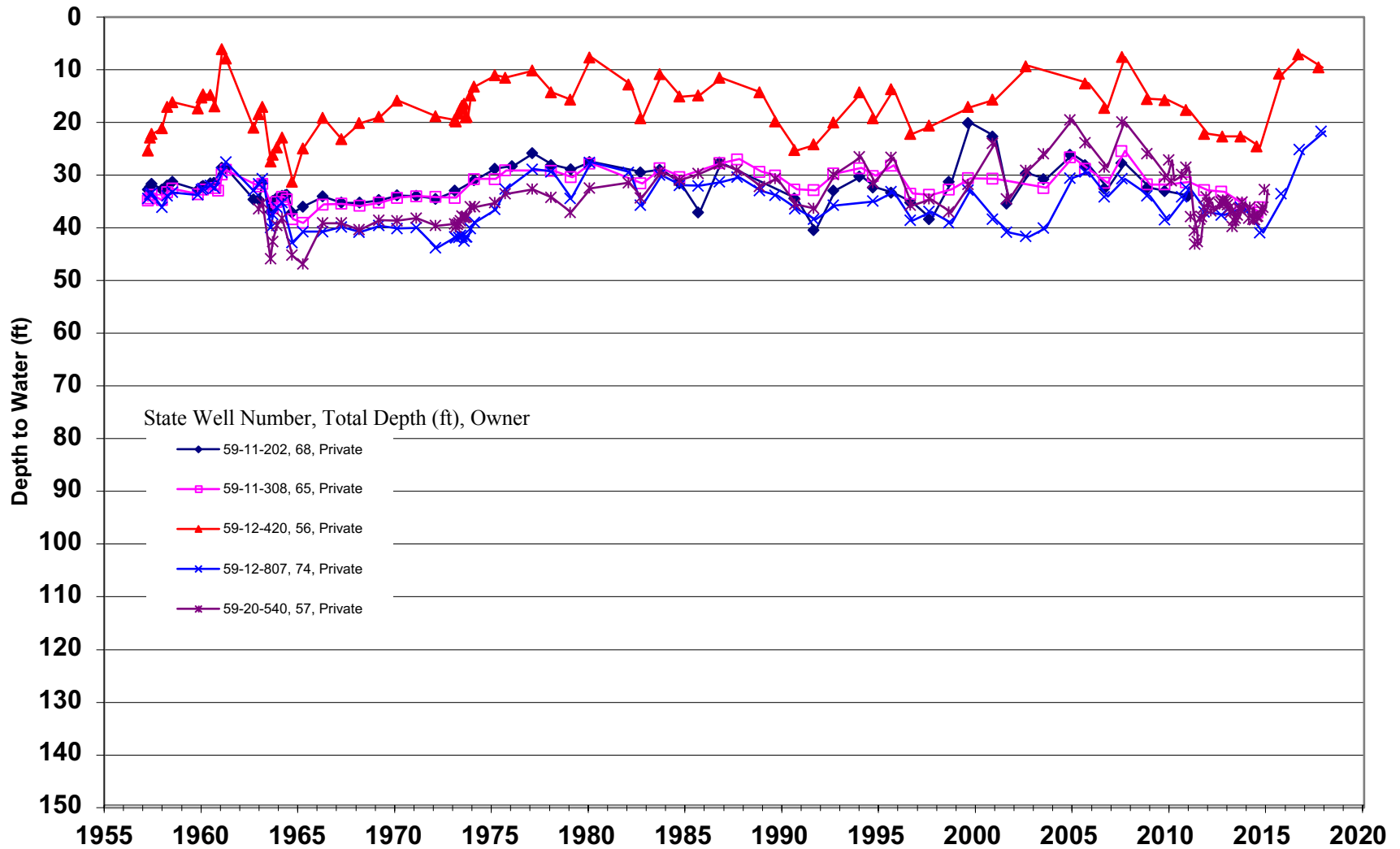


Extent of Brazos River Alluvium

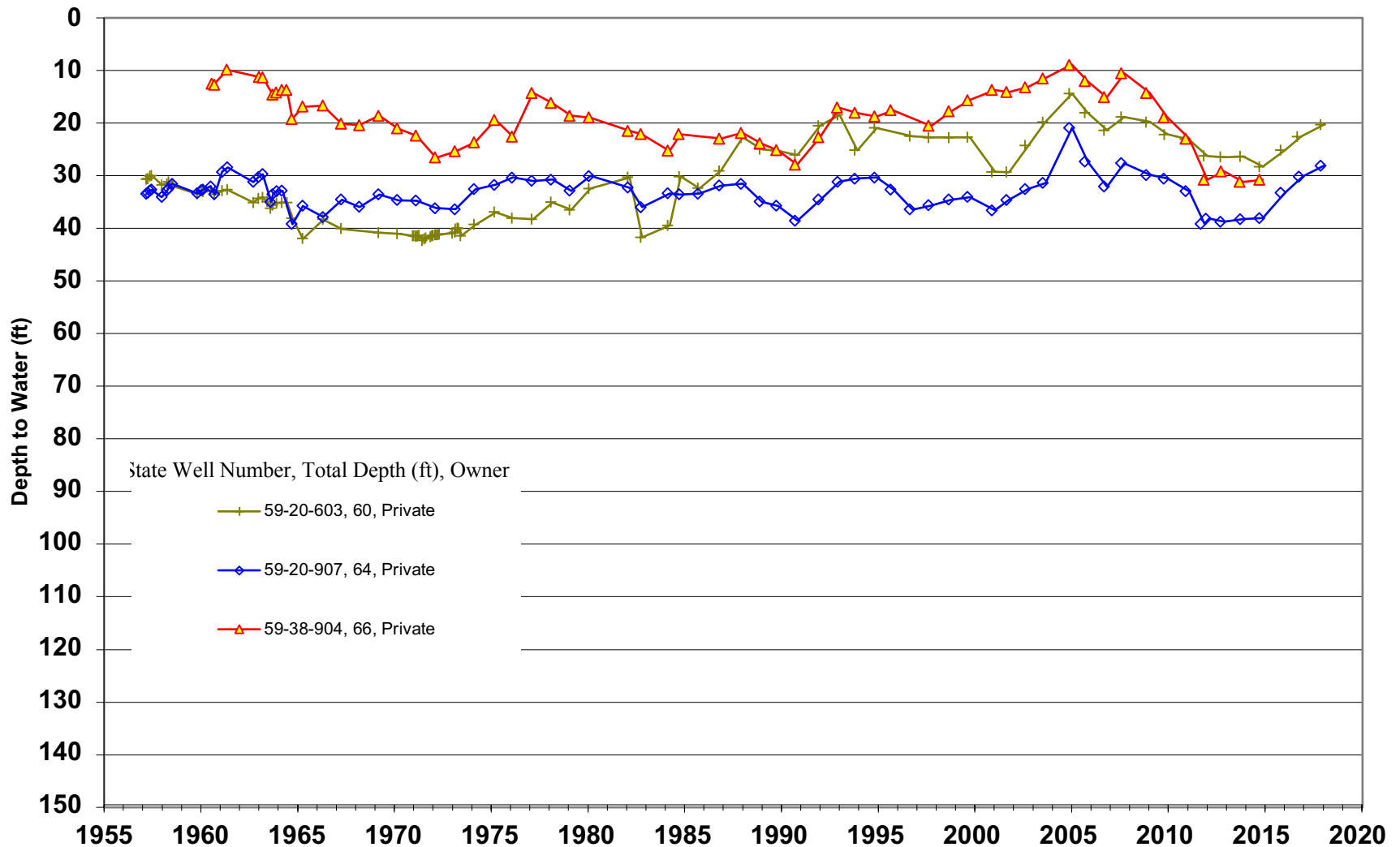
Location of Brazos River Alluvium Wells With Water Level Hydrographs



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





??Questions??

Thank you!