Aquifer Desired Future Conditions 2019 Update

Presented to

BVGCD Board of Directors

By

Ground Water Consultants, LLC

May 9, 2019

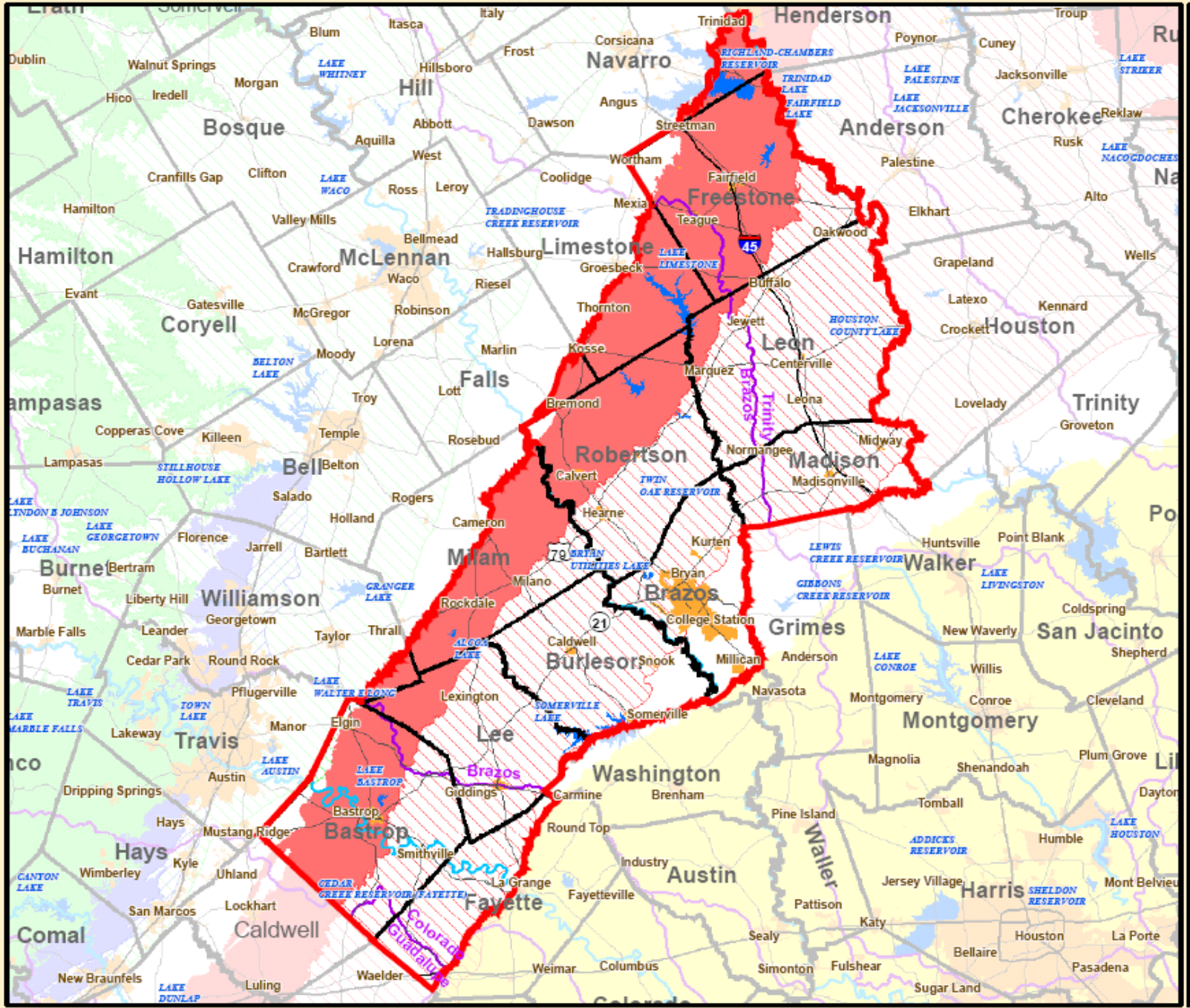
Desired Future Conditions

- 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 (DFCs), except for Brazos River Alluvium where matrix is percent of aquifer saturation
- Well static water-level data used to help monitor aquifer response to pumping and estimate average artesian head changes

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 of GMA 12
- 2017 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)

Map prepared by Mark Hayes
Texas Water Development Board
GIS Section
12/21/2005

0 7 14 21 28 Miles

5/9/2019

1 inch equals 26 miles

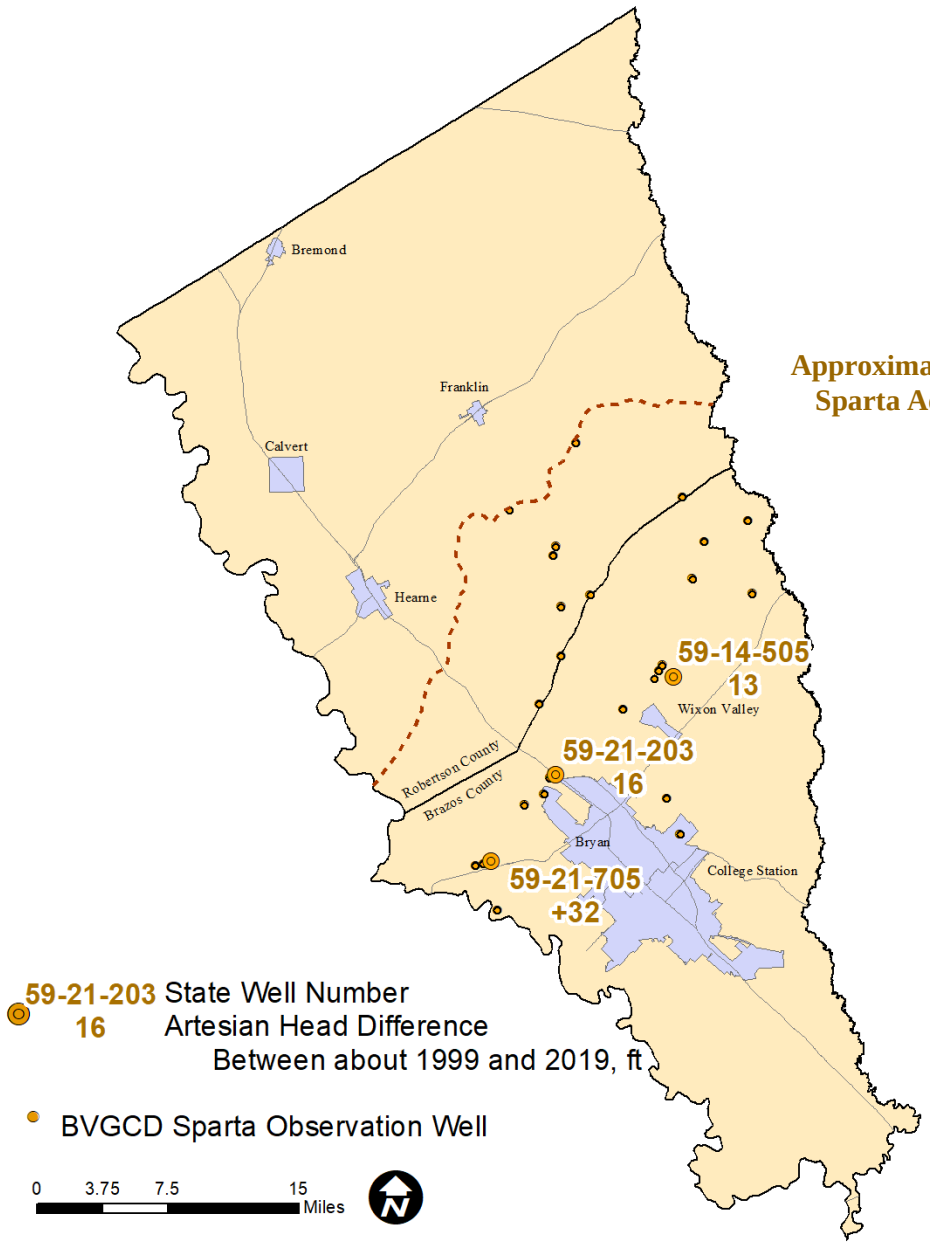
DFC Goals

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

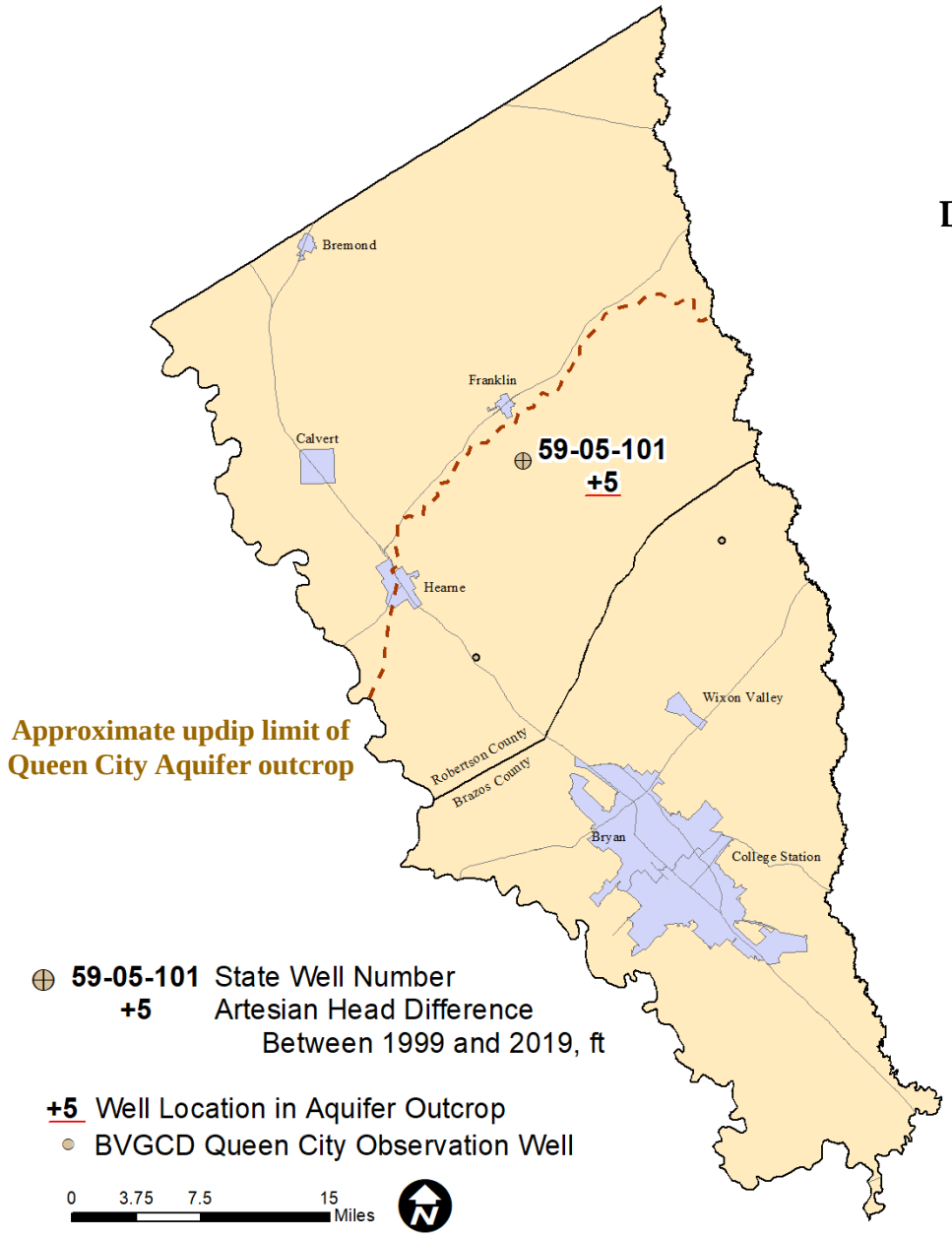
Average Artesian Head Change = +1 foot

DFC by 2070: Average Artesian Head Decline 12 feet

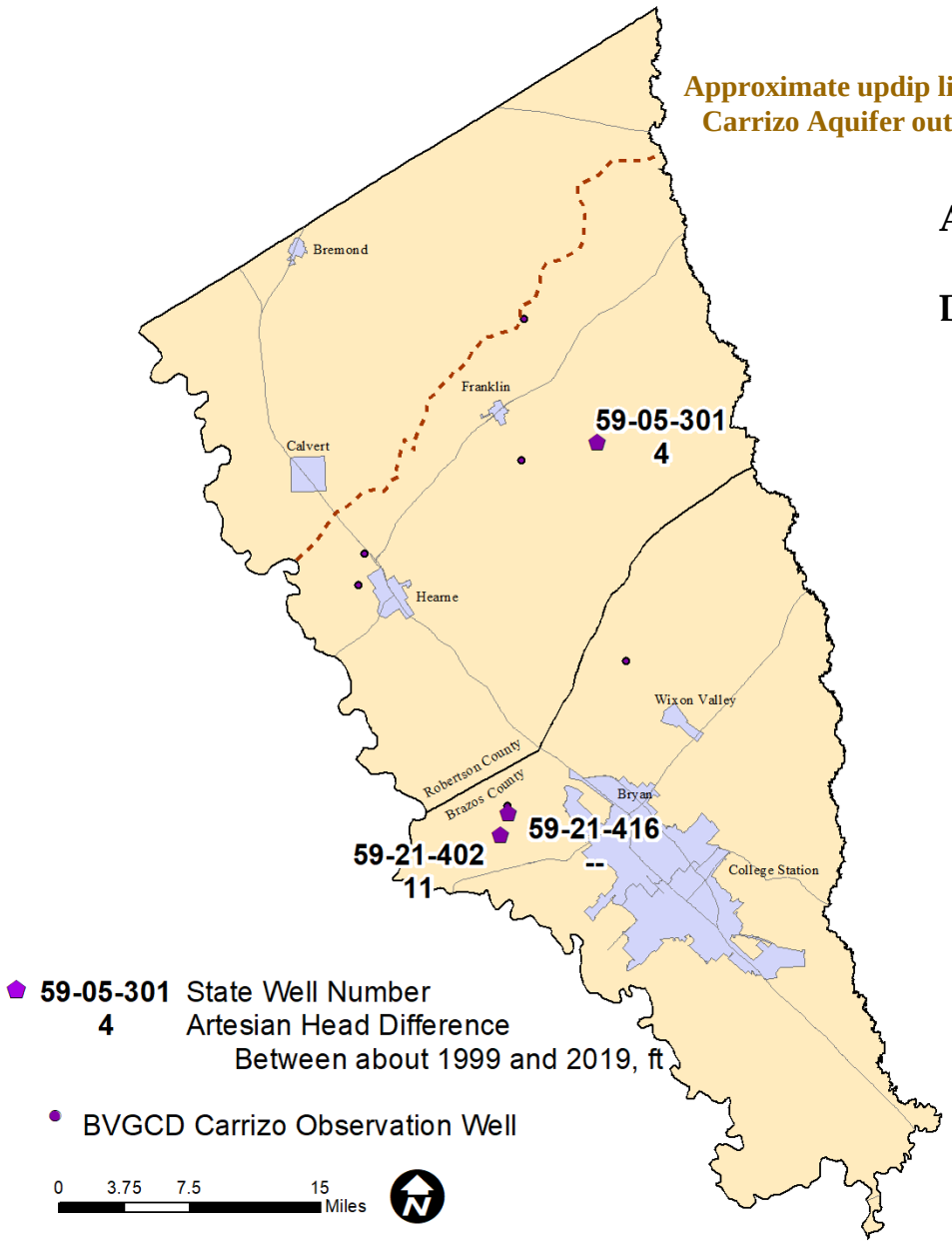


Queen City Aquifer

DFC by 2070: Average Artesian Head Decline 12 feet



Carrizo Aquifer

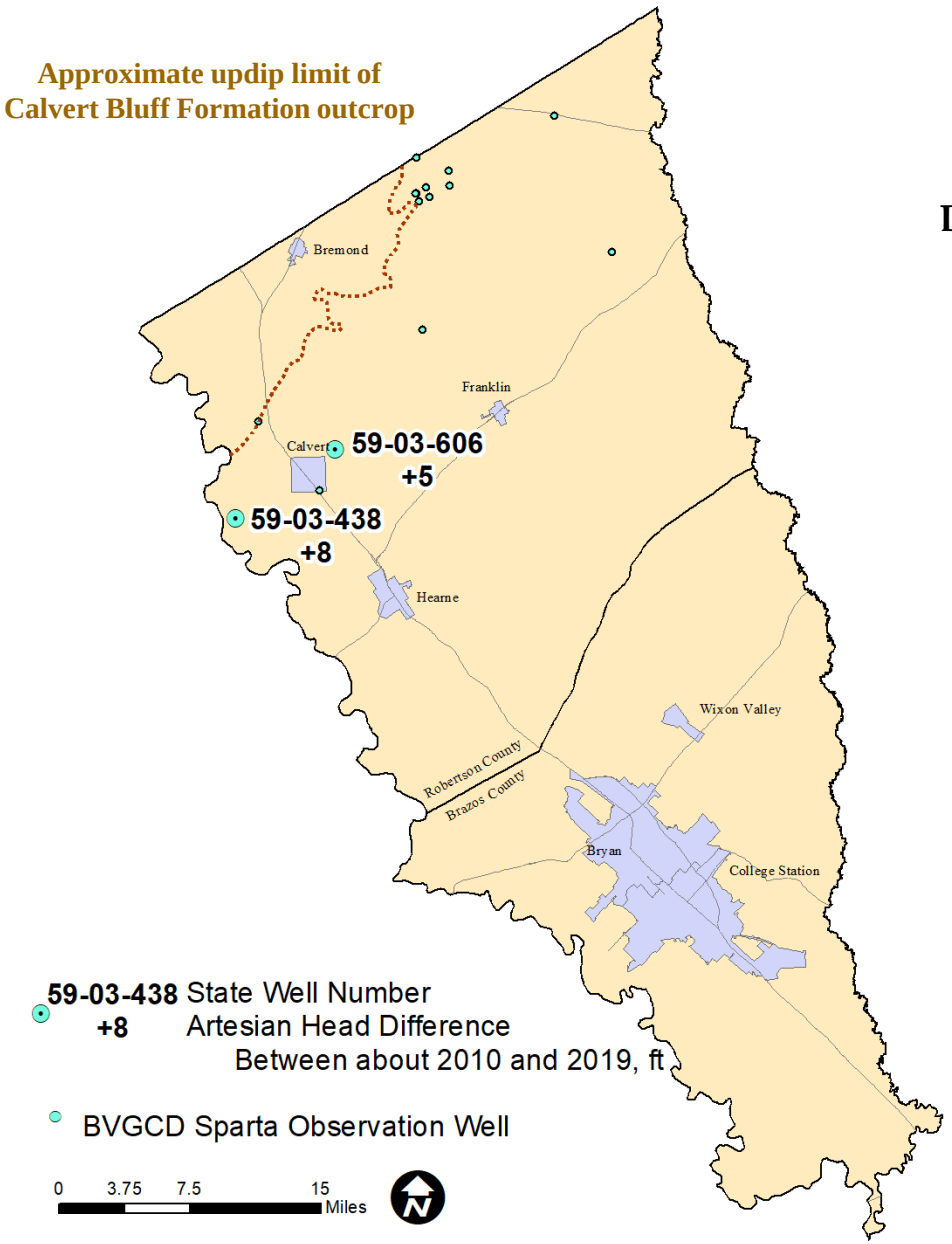


Average Artesian Head Decline = 8 feet

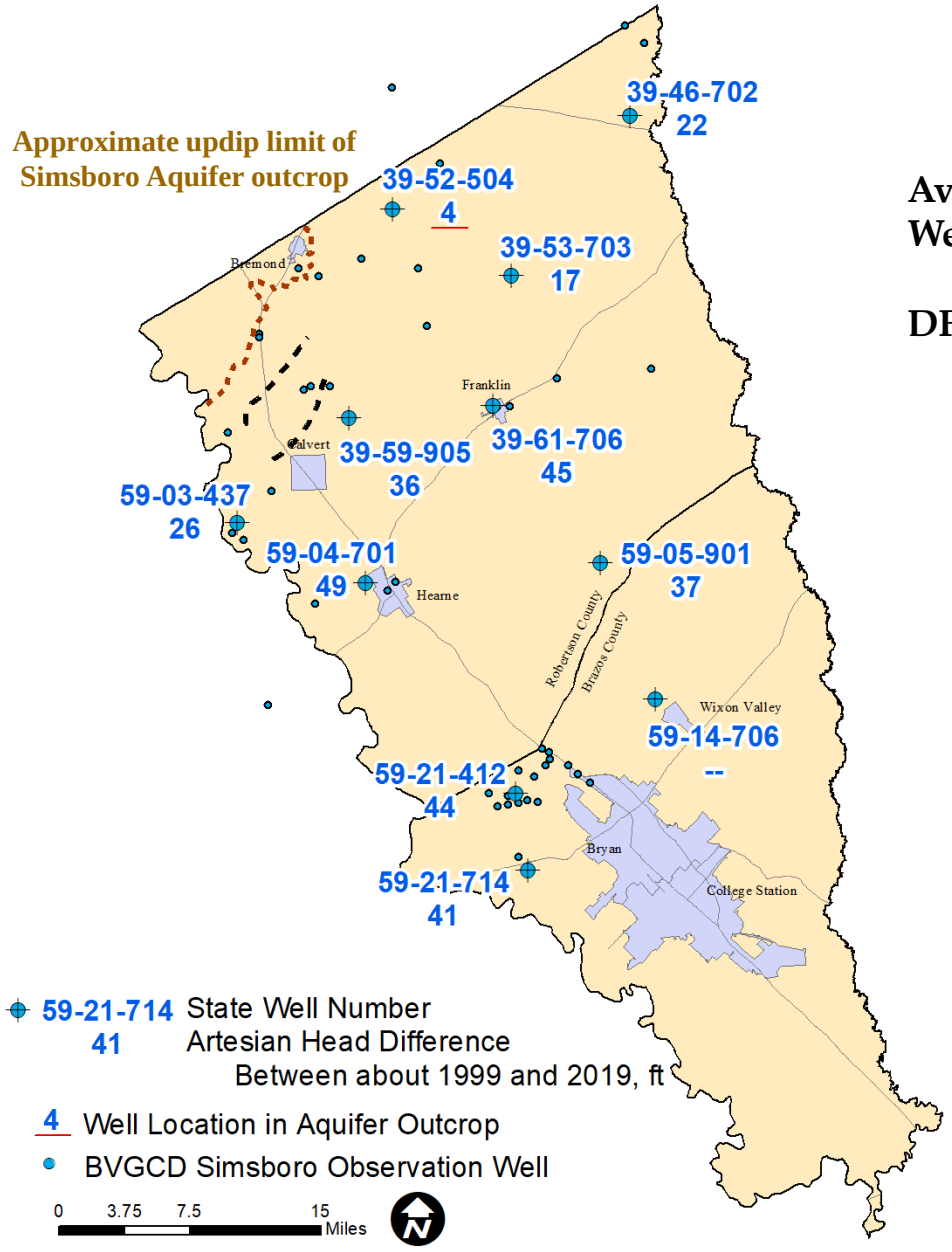
DFC by 2070: Average Artesian Head Decline 61 feet

Calvert Bluff Formation

DFC by 2070: Average Artesian Head Decline 125 feet



Simsboro Aquifer



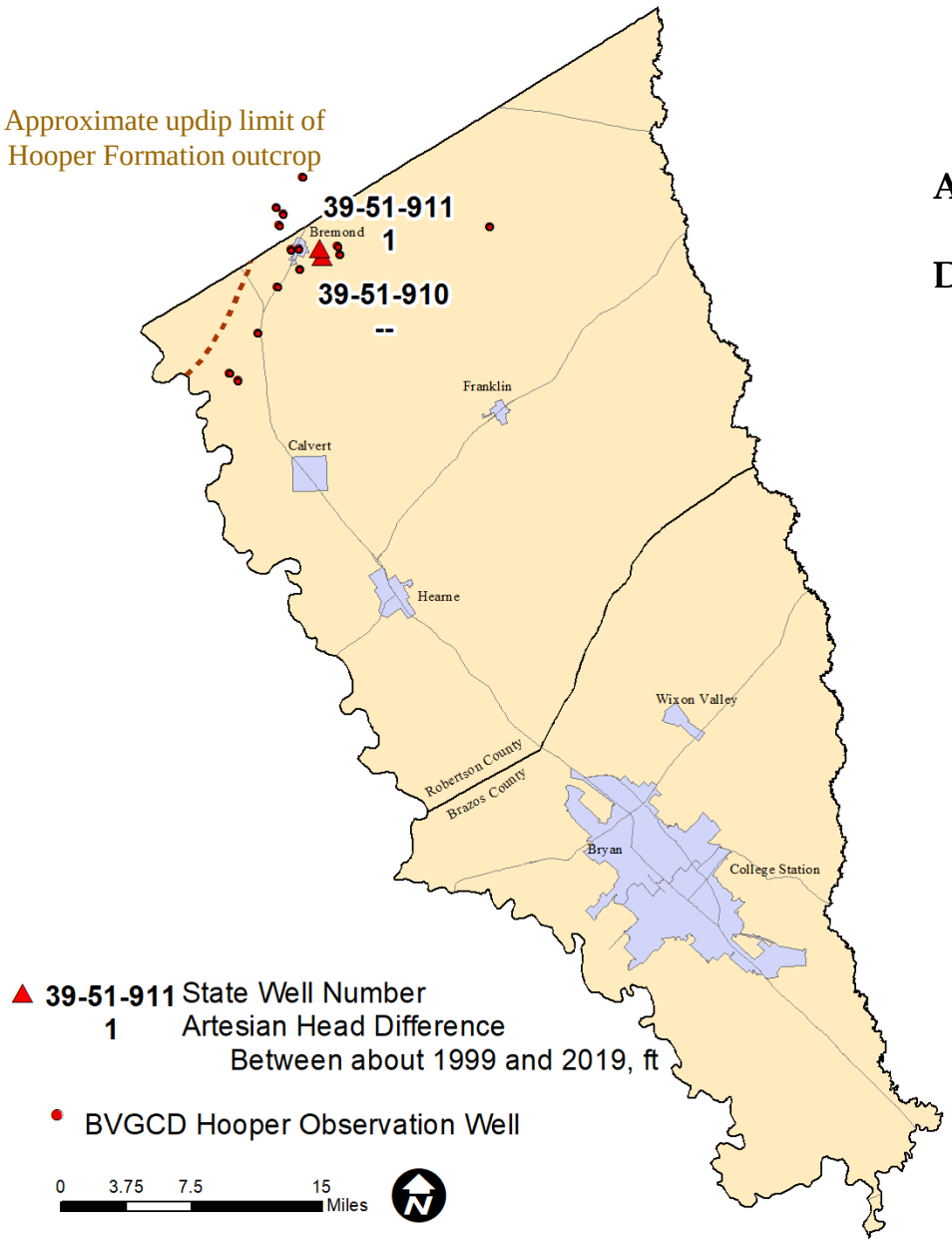
Average Artesian Head Decline = 32 feet
Weighted Average Artesian Head Decline = 35 feet

DFC by 2070: Average Artesian Head Decline 295 feet

Hooper Formation

Average Artesian Head Decline = 1 foot

DFC by 2070: Average Artesian Head Decline 207 feet

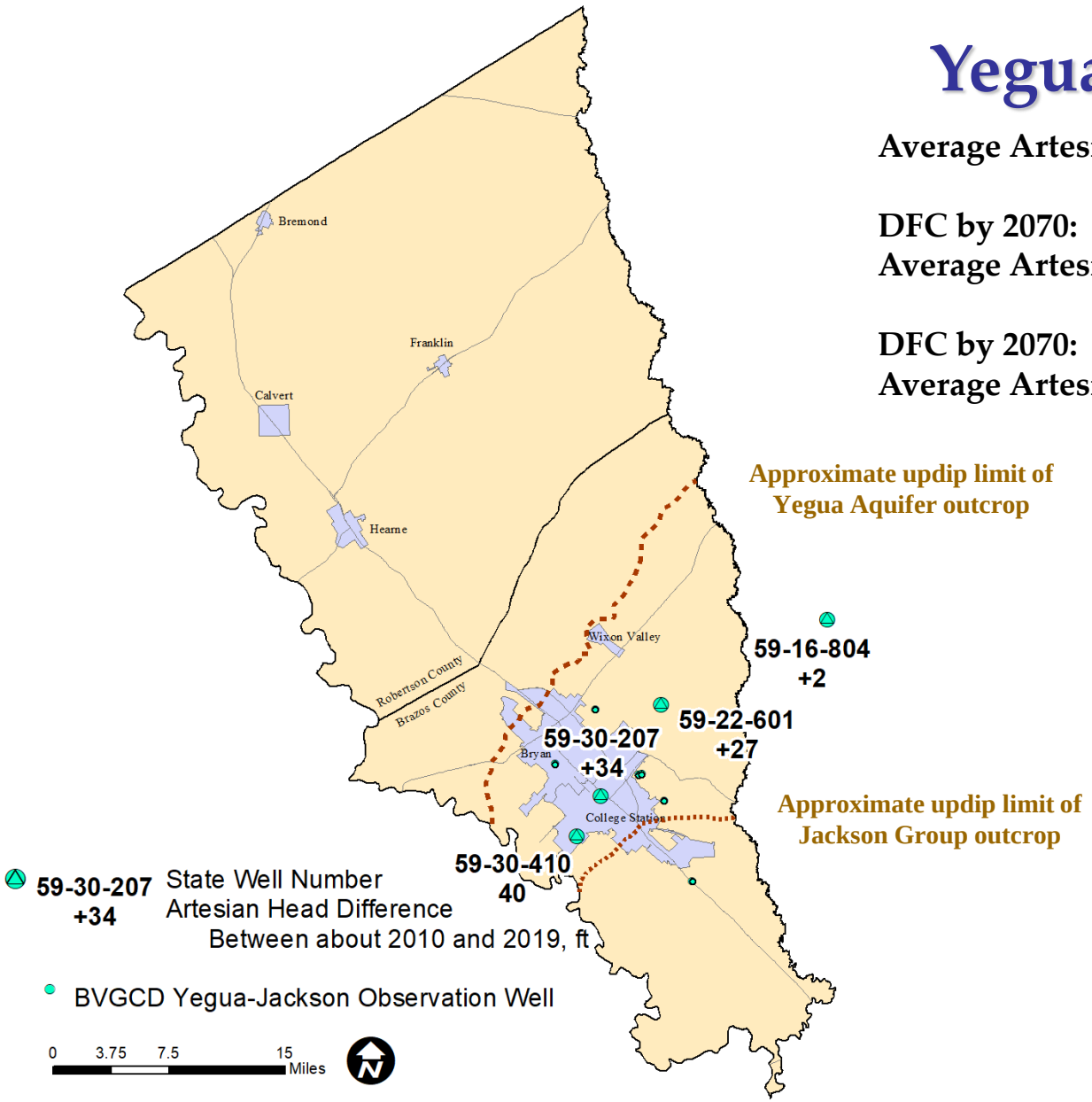


Yegua-Jackson Aquifer

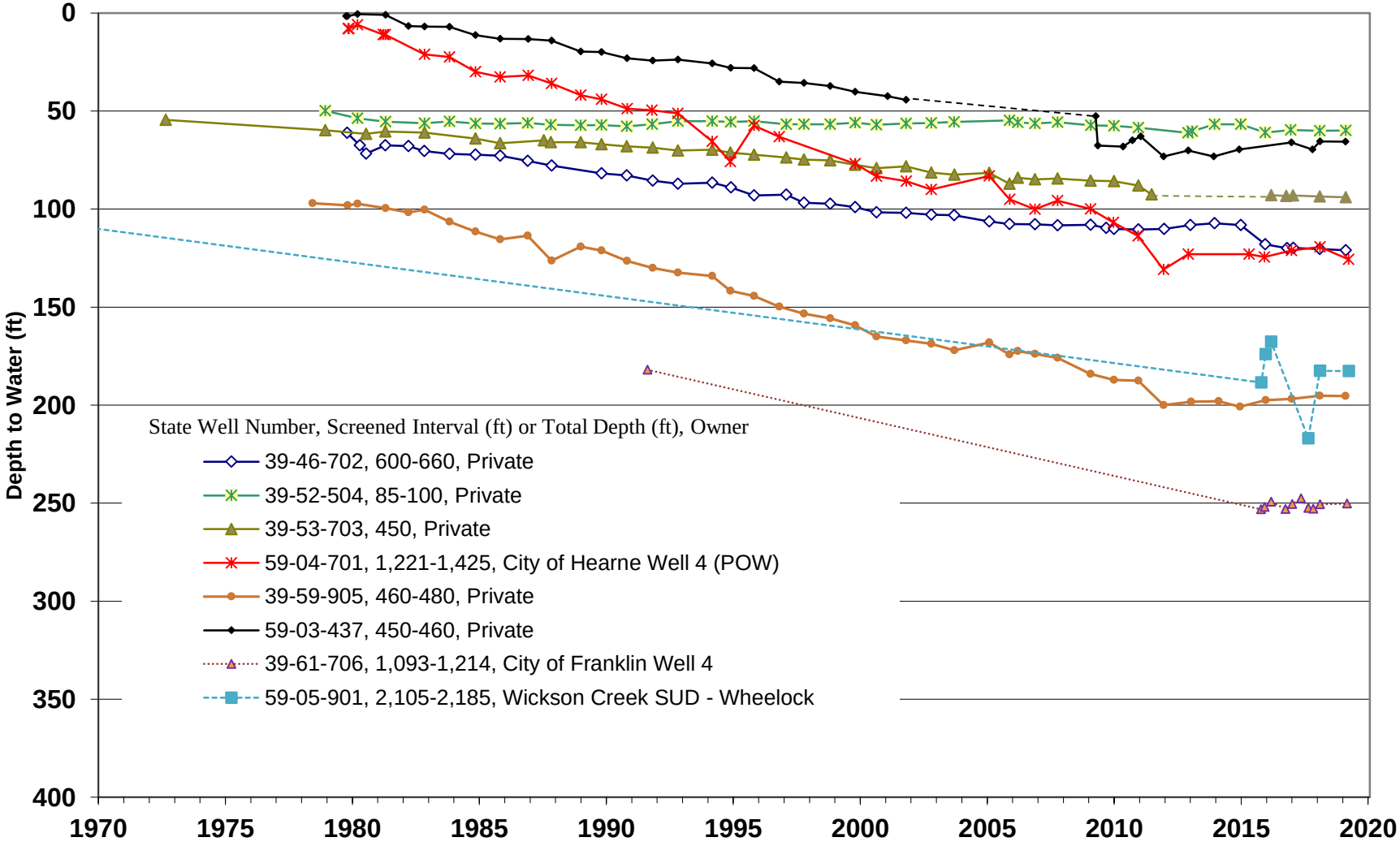
Average Artesian Head Change = +6 feet

DFC by 2070:
Average Artesian Head Decline 70 feet (Yegua)

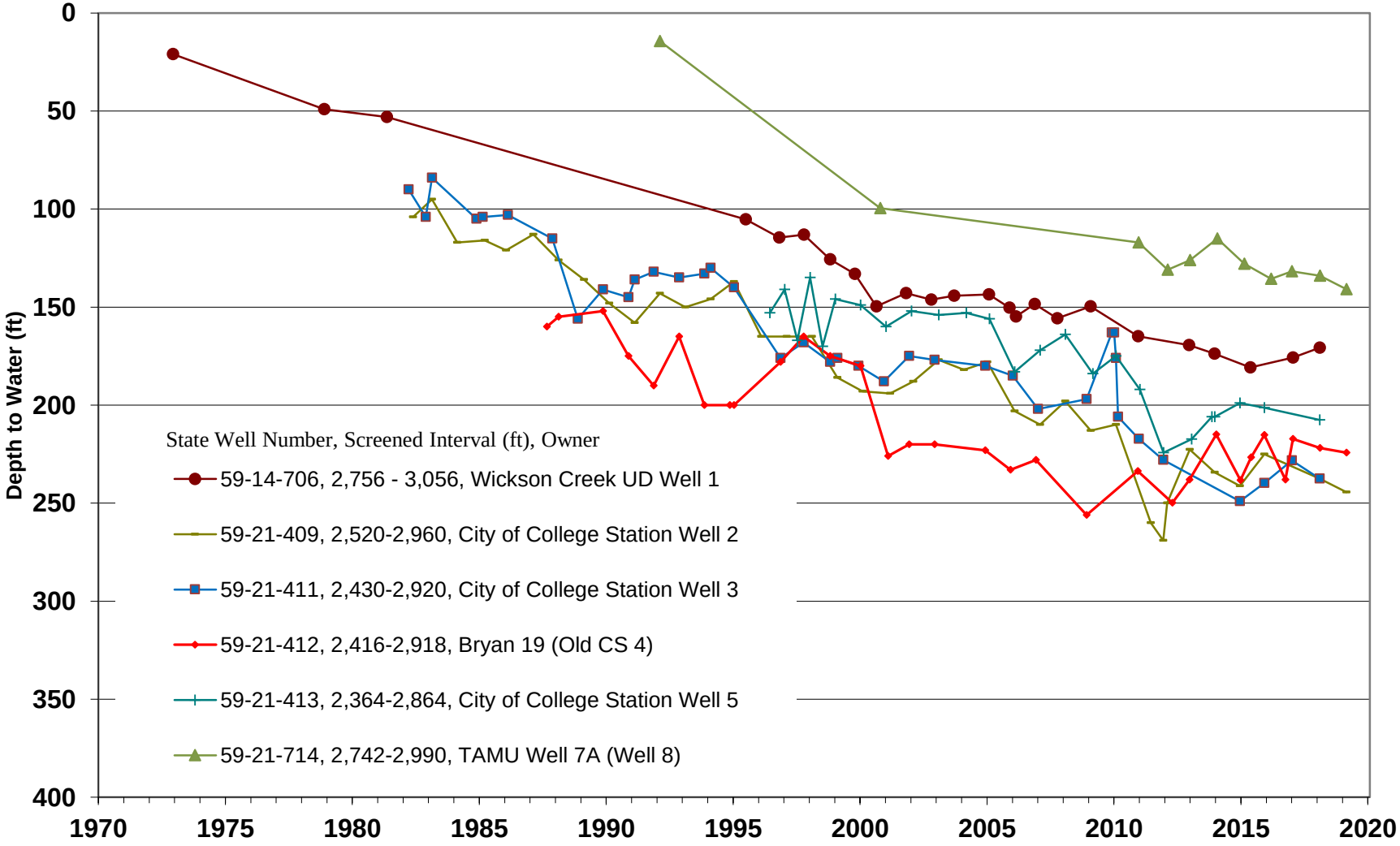
DFC by 2070:
Average Artesian Head Decline 110 feet (Jackson)



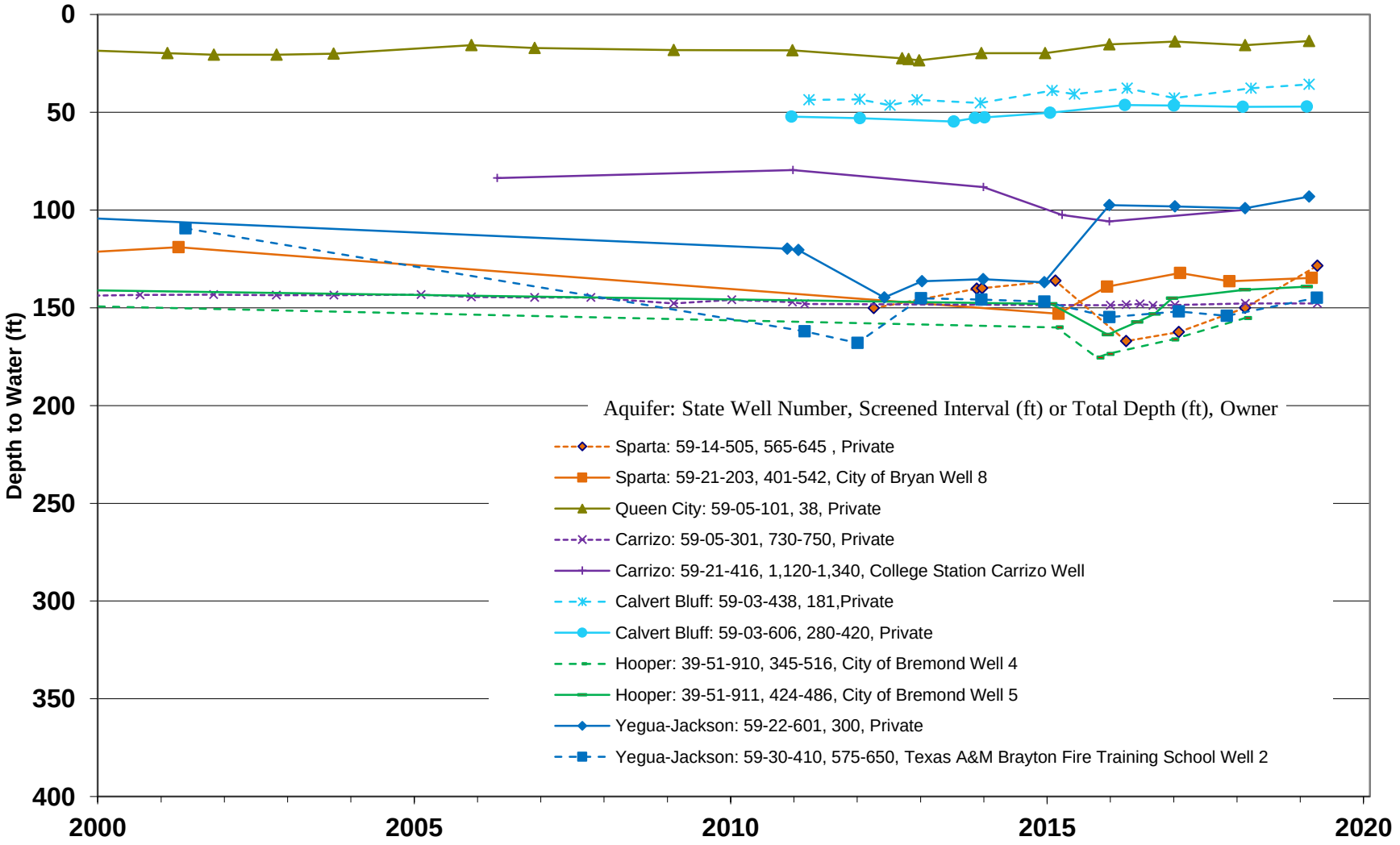
SIMSBORO AQUIFER OBSERVATION WELLS
Robertson County

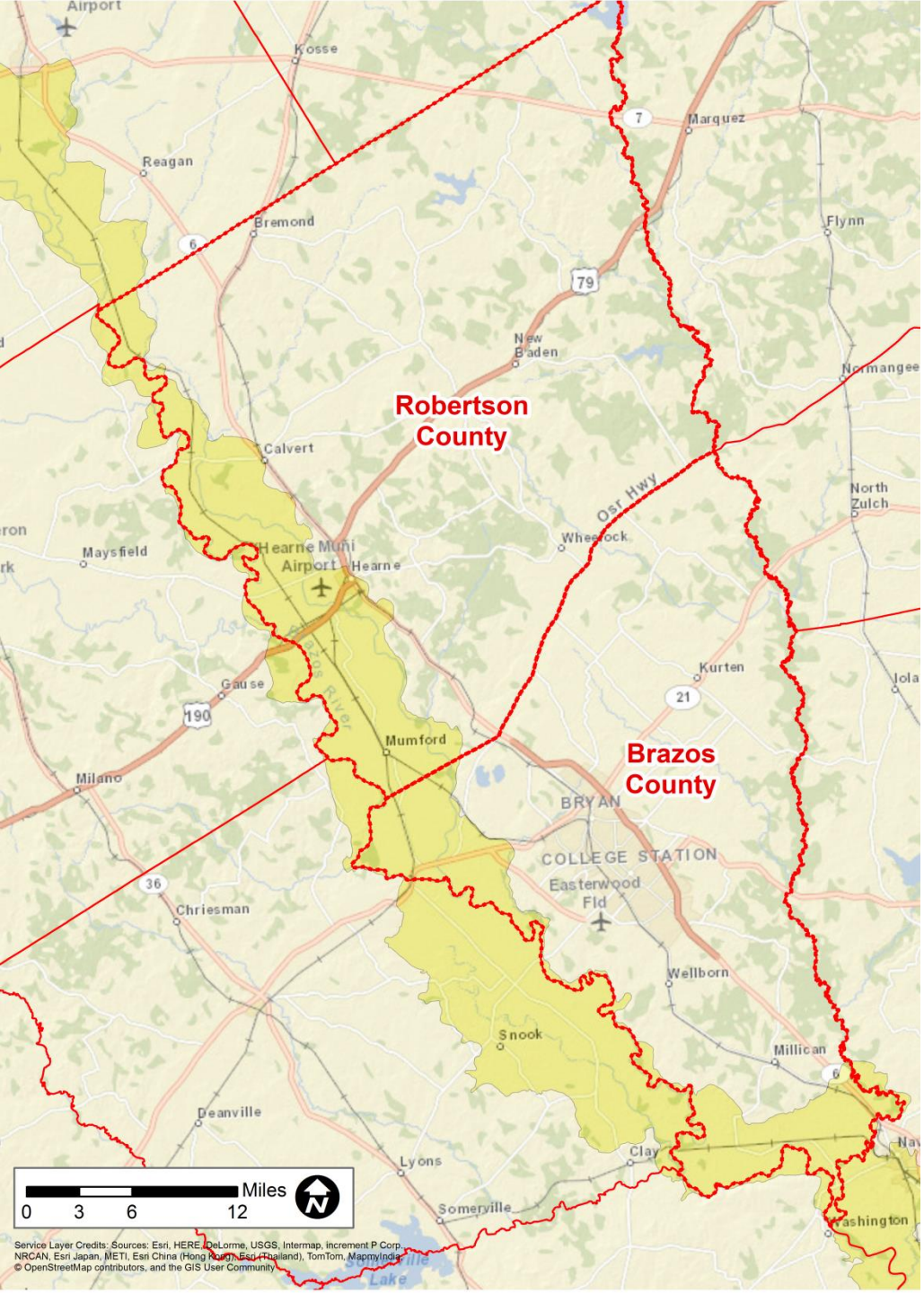


SIMSBORO AQUIFER OBSERVATION WELLS
Brazos County

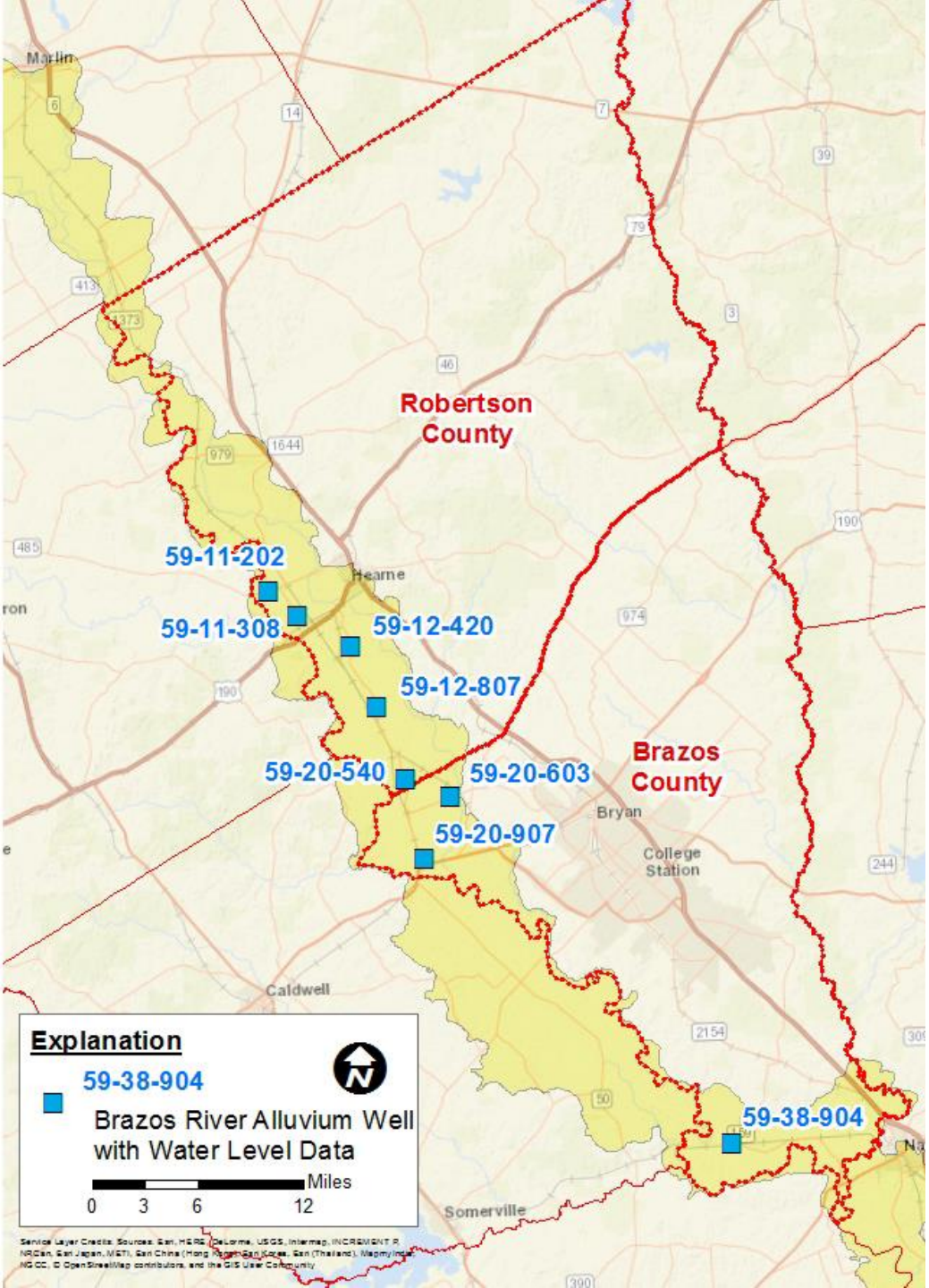


YEGUA-JACKSON, SPARTA, QUEEN CITY, CARRIZO, CALVERT BLUFF AND HOOPER OBSERVATION WELLS



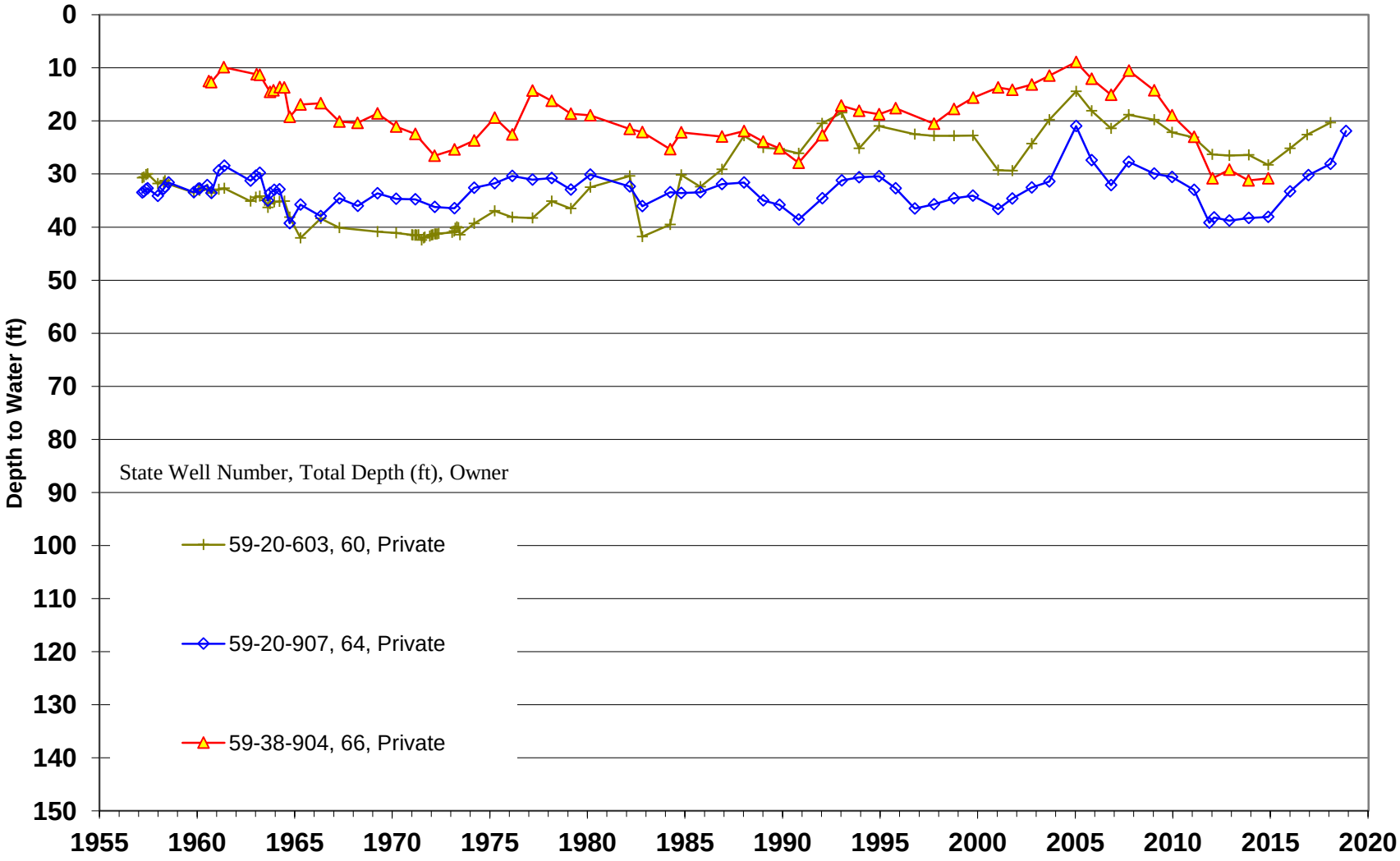


Extent of Brazos River Alluvium

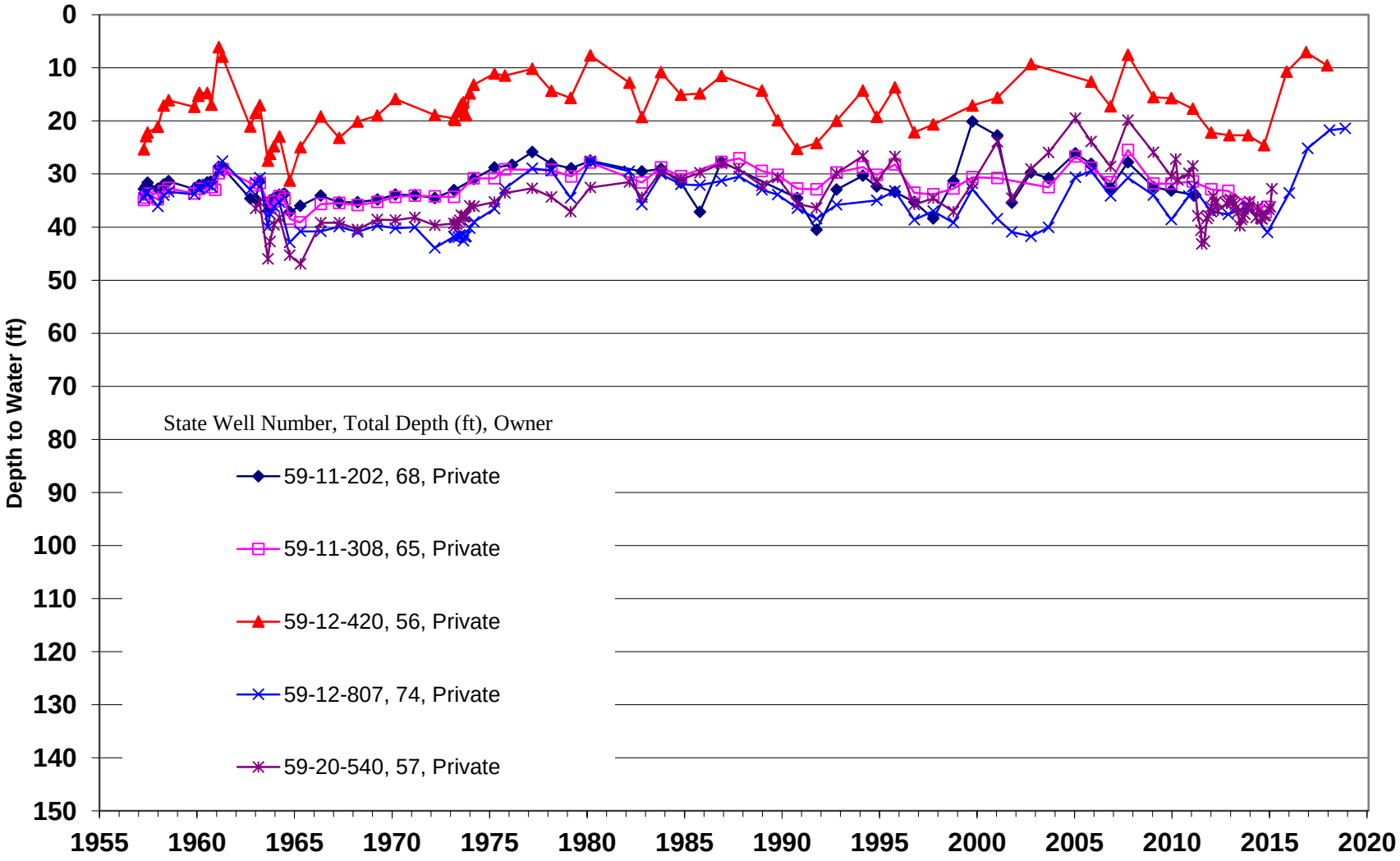


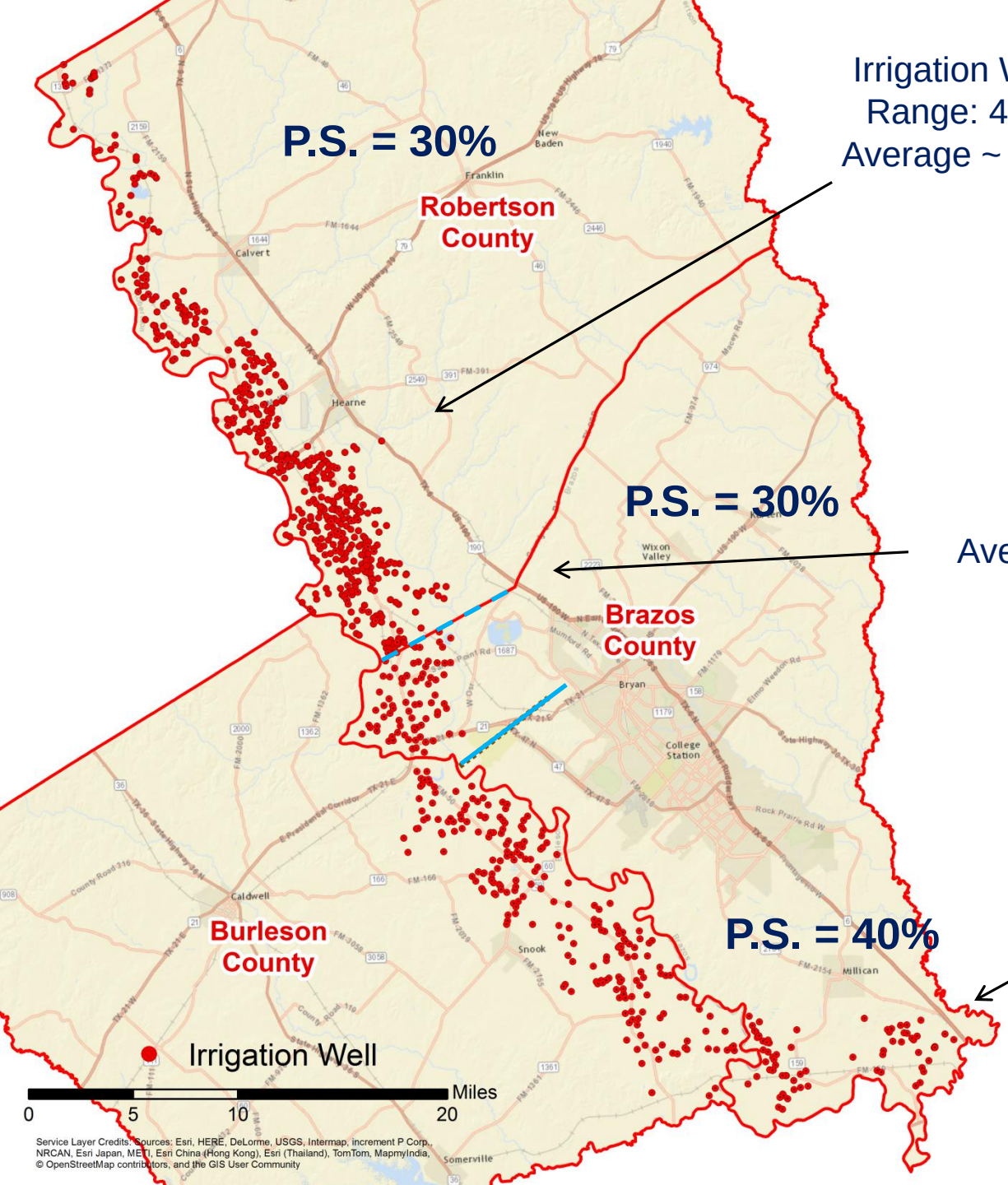
Location of Brazos River Alluvium Wells With Water Level Hydrographs

BRAZOS RIVER ALLUVIUM OBSERVATION WELLS
Brazos County



BRAZOS RIVER ALLUVIUM OBSERVATION WELLS
Robertson County





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

Potential DFC Threshold on Allowable Percent Saturation
P.S. ≥ 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

5/9/2019

Summary

- Based on water level data, average artesian head changes through 2019 about the same as through 2018
- A few wells unavailable for water level measuring in the last few months and will be measured when available
- Water level hydrograph data are overwhelmingly reflective of very limited water level changes in the past few years
- Water levels measured in Brazos River Alluvium screened wells continue to show an upward to stable water level trend


??Questions??
Thank you!