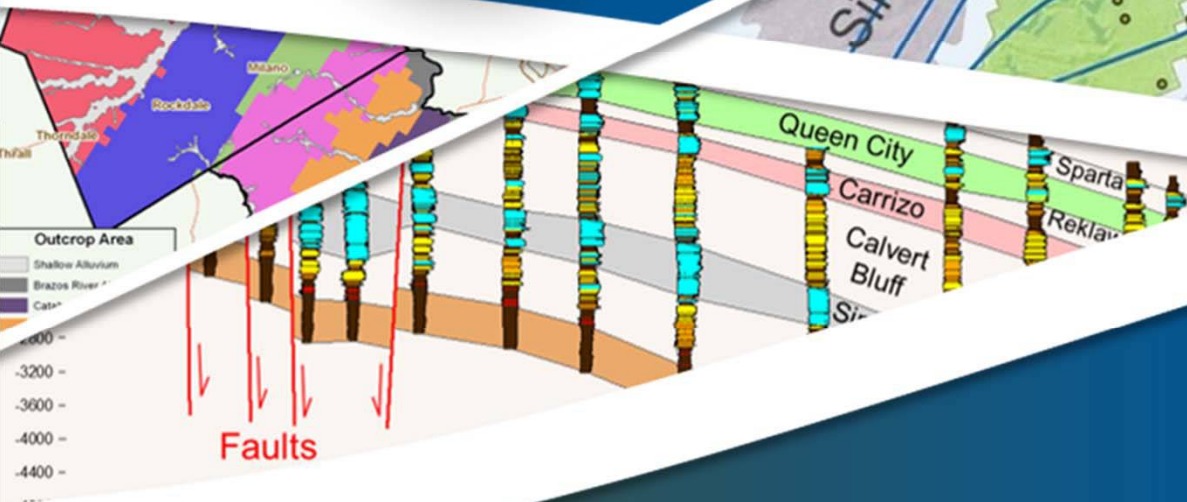


Presentation to DFC Committee: Compliance Monitoring

Presented To:



Presented By:

Steve Young

Jevon Harding

Ross Kushnereit



August 6, 2019

Agenda

- Desired Future Condition (DFCs)
- Sparta Discussion
- Protective Drawdown Limits (PDLs)

DFC Compliance

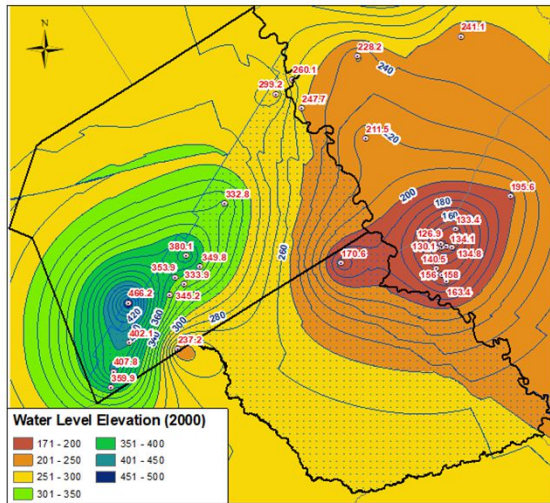
GCD or County	Average Aquifer Drawdown (ft) measured from January 2000 through December 2069					
	Sparta	Queen City	Carrizo	Calvert Bluff	Simsboro	Hooper
Brazos Valley GCD	12	12	61	125	295	207
Fayette County GCD	47	64	110	Declared as non-relevant		
Lost Pines GCD	5	15	62	100	240	165
Mid-East Texas GCD	5	2	80	90	138	125
Post Oak Savannah GCD	28	30	67	149	318	205
Falls County	--	--	--	--	-2	27
Limestone County	--	--	--	11	50	50
Navarro County	--	--	--	-1	3	3
Williamson County	--	--	--	-11	47	69
GMA-12	16	16	75	114	228	168

GCD	Average Aquifer Drawdown (ft) measured from January 2010 through December 2069		
	Yegua	Jackson	Yegua-Jackson
Brazos Valley GCD	70	114	--
Fayette County GCD	--	--	77
Lost Pines GCD	--	--	--
Mid-East Texas GCD	--	--	7
Post Oak Savannah GCD	--	--	100
GMA-12	--	--	65

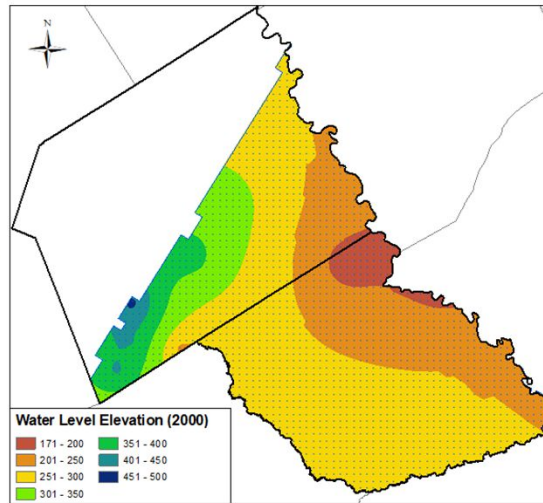
**Official DFCs adopted by
Groundwater Management
Area 12**

DFC Compliance

Interpolate Baseline (2000)
Simsboro Water Level Surface



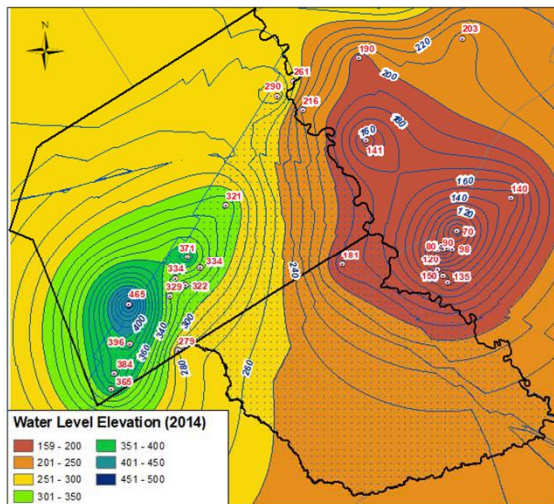
Clip Baseline (2000) Water
Level Surface to Simsboro Zone



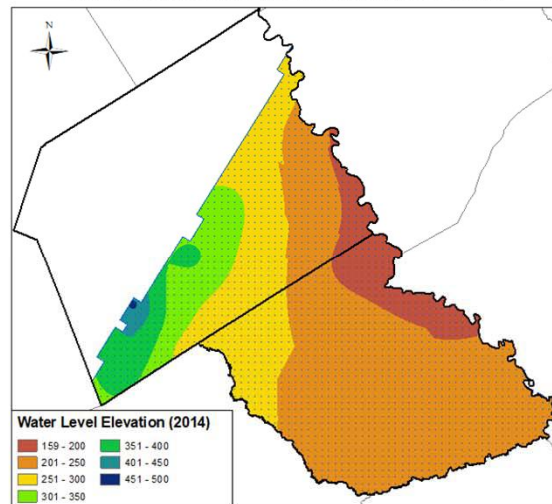
Only use wells with 2000 water level

Calculate Average
Baseline (2000)
Water Level Elevation

Interpolate Evaluation Year (2014)
Simsboro Water Level Surface



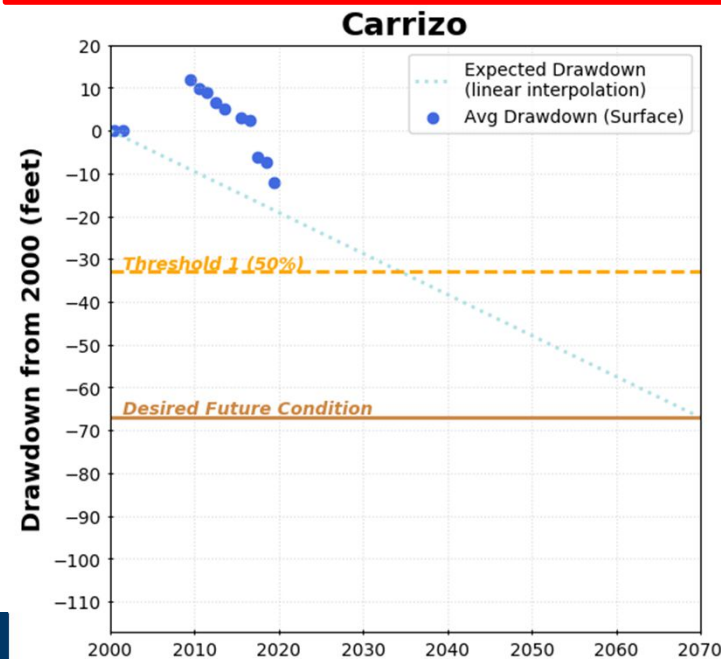
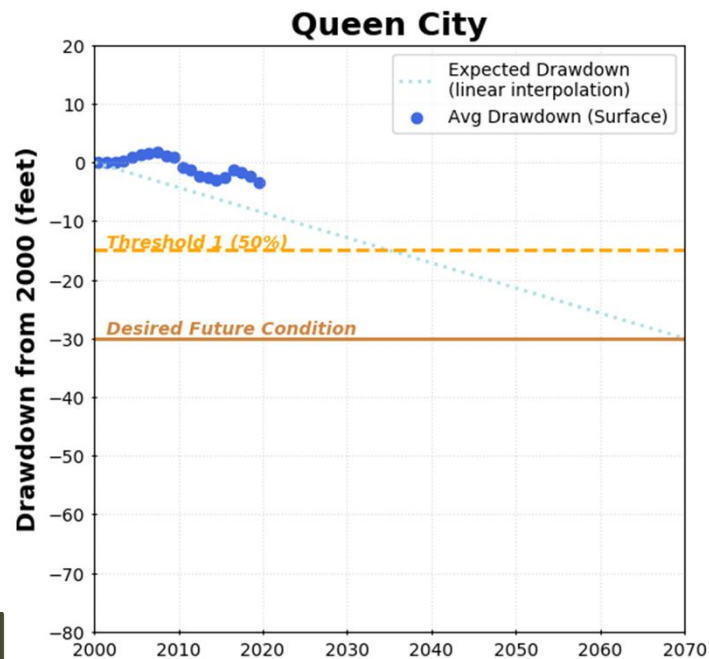
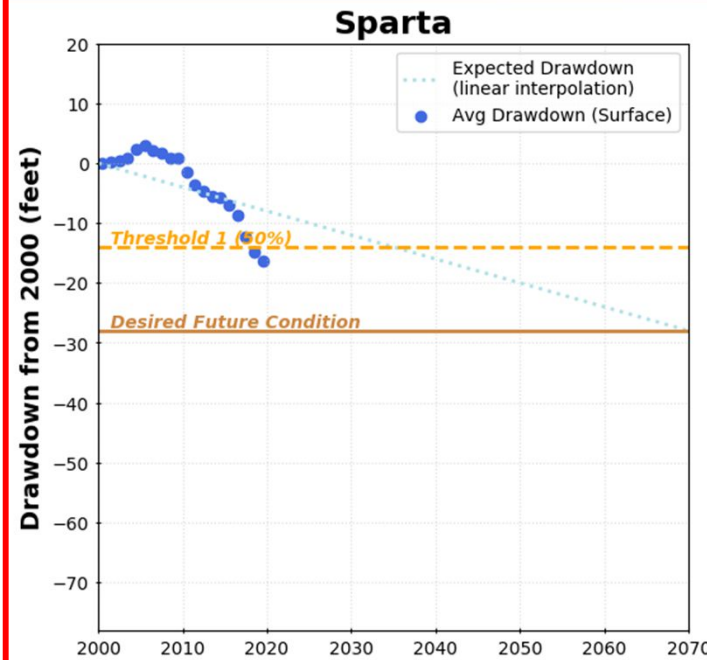
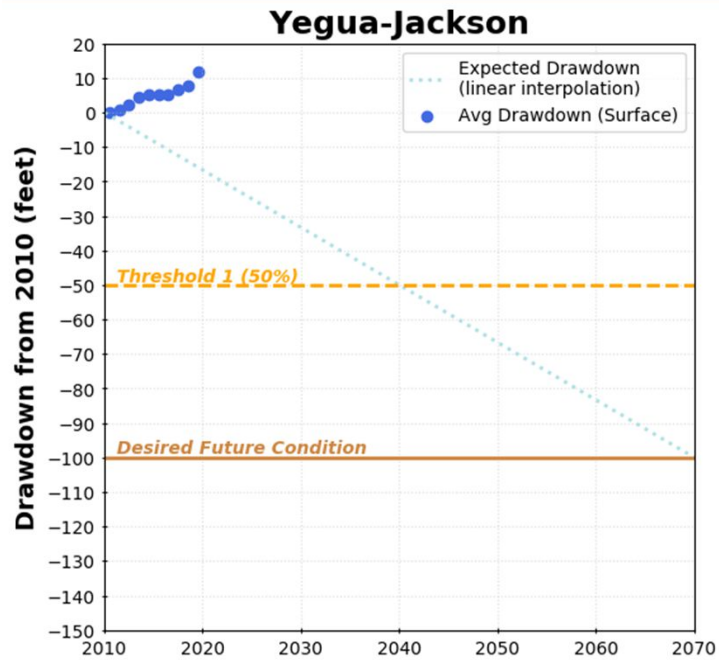
Clip Evaluation Year (2014) Water
Level Surface to Simsboro Zone



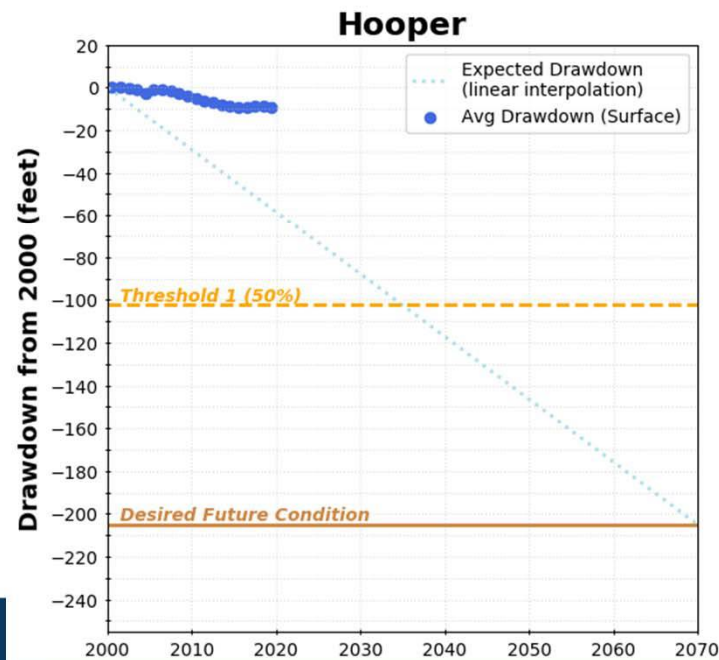
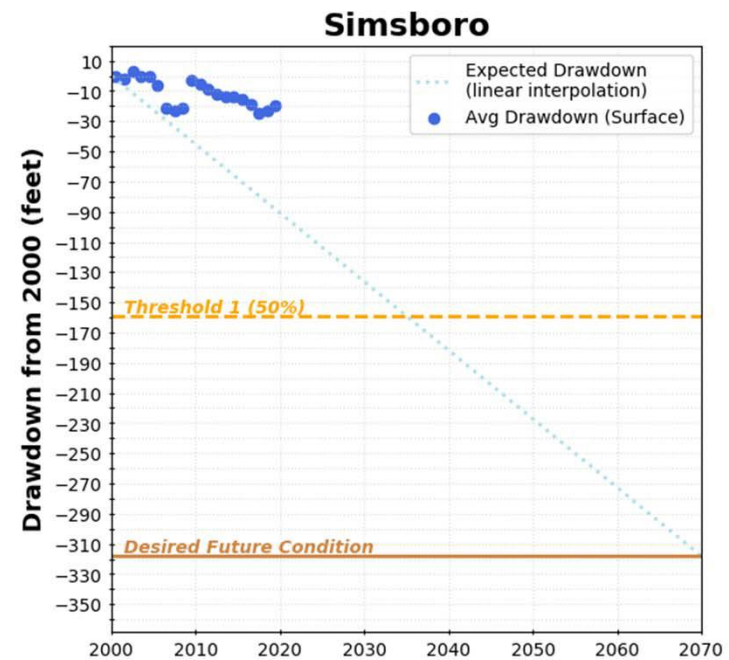
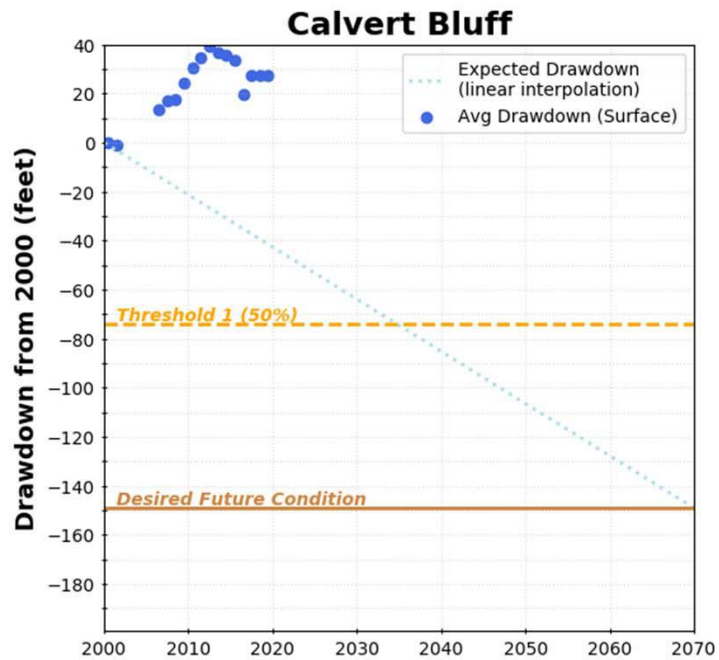
Average Drawdown =
Baseline WL (2000) – Evaluation Year WL (2014)

Calculate Average
Evaluation Year (2014)
Water Level Elevation

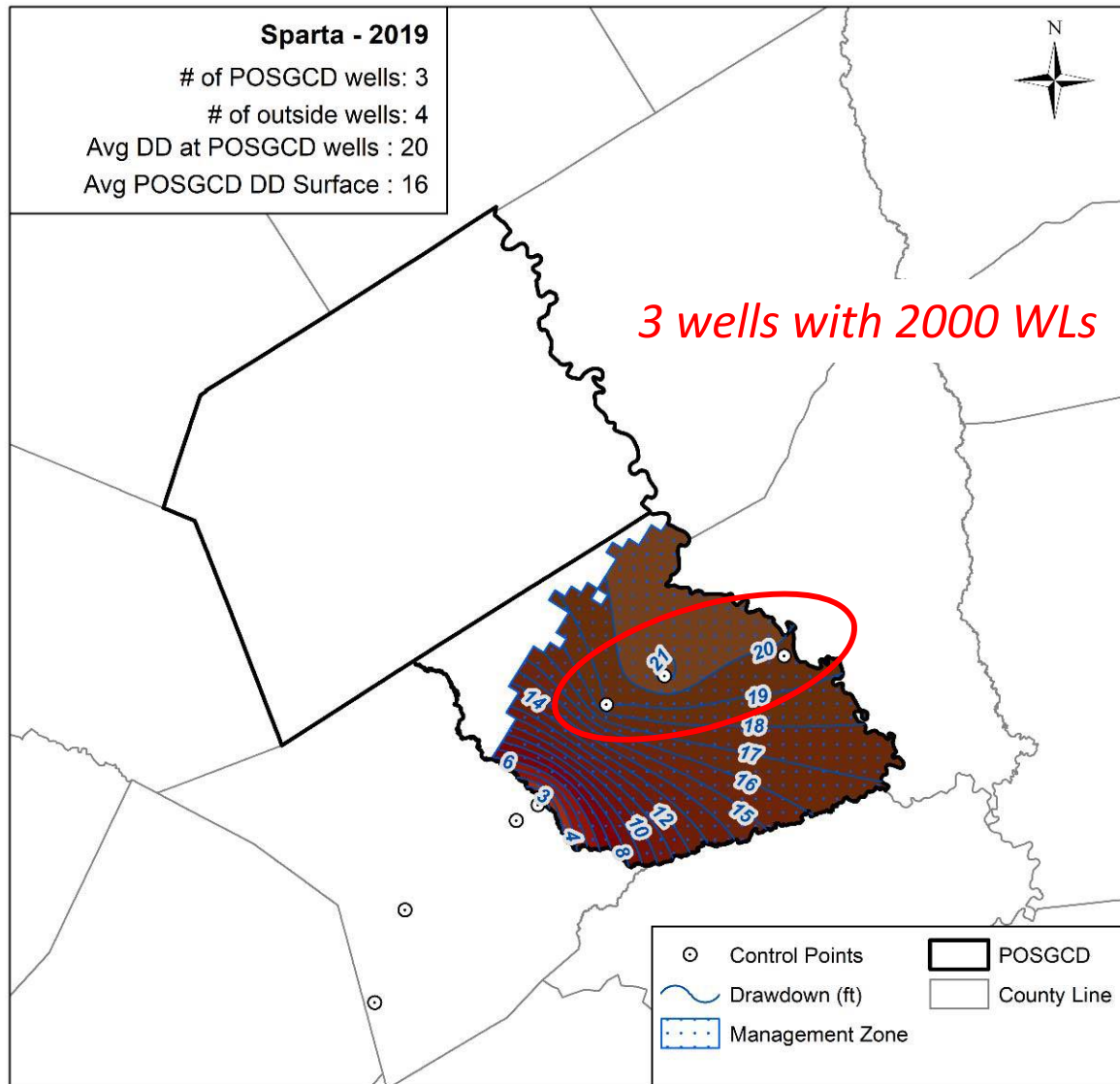
DFC Compliance



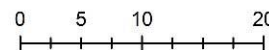
DFC Compliance



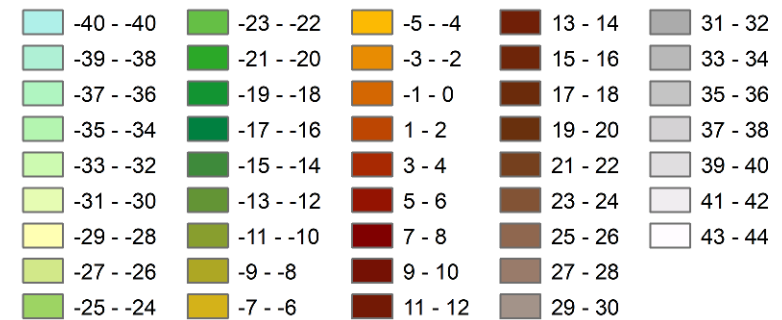
Sparta Discussion



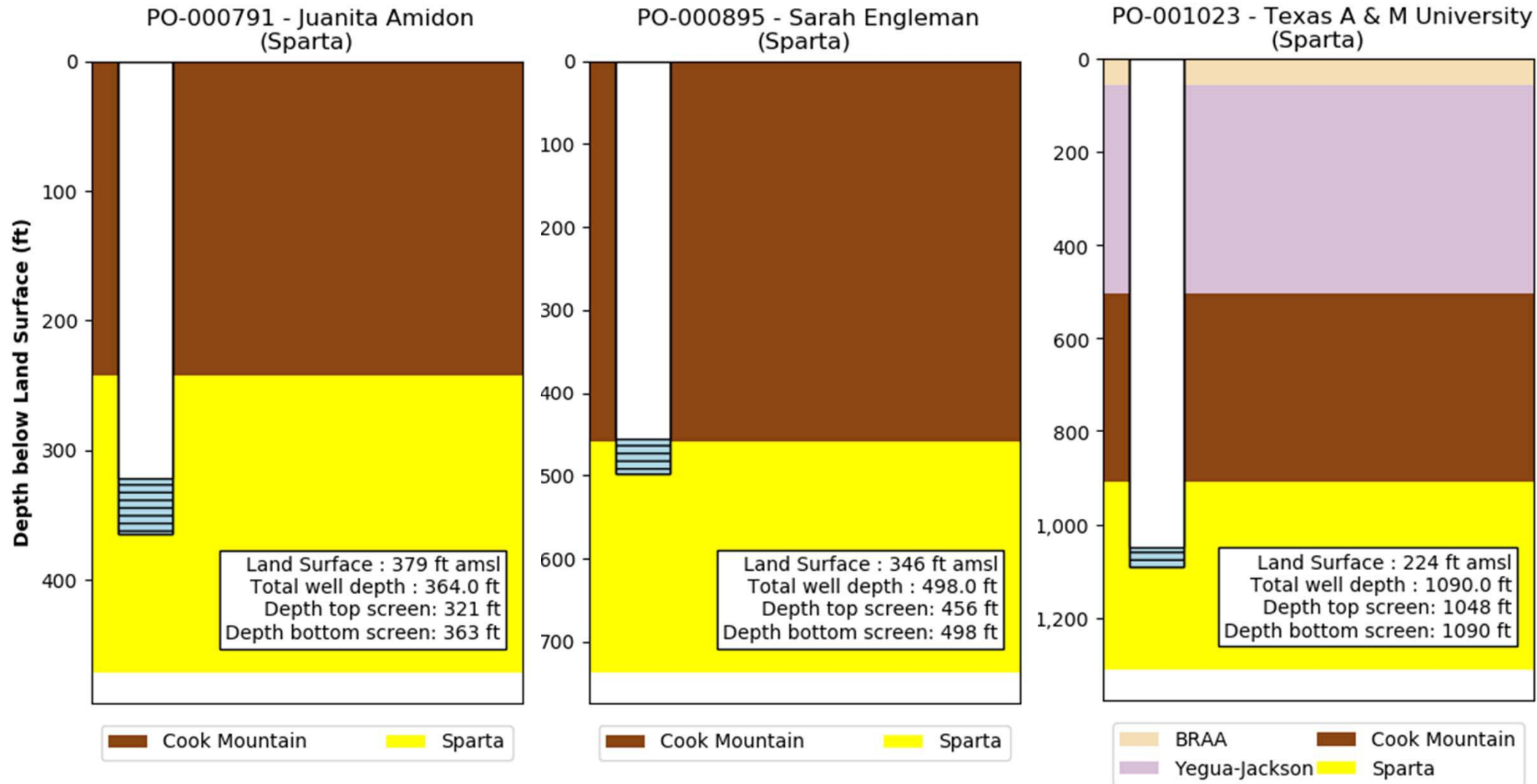
Drawdown (feet) from 2000 to 2019 :Sparta



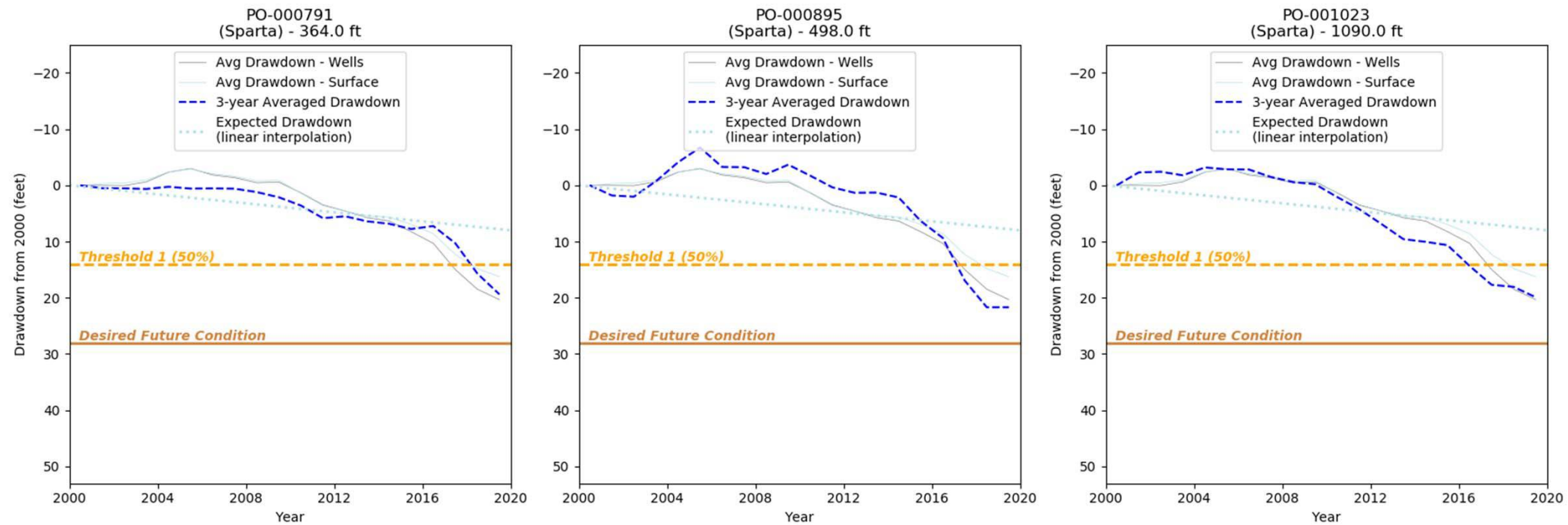
Drawdown (feet) from 2000 to 2019 :Sparta



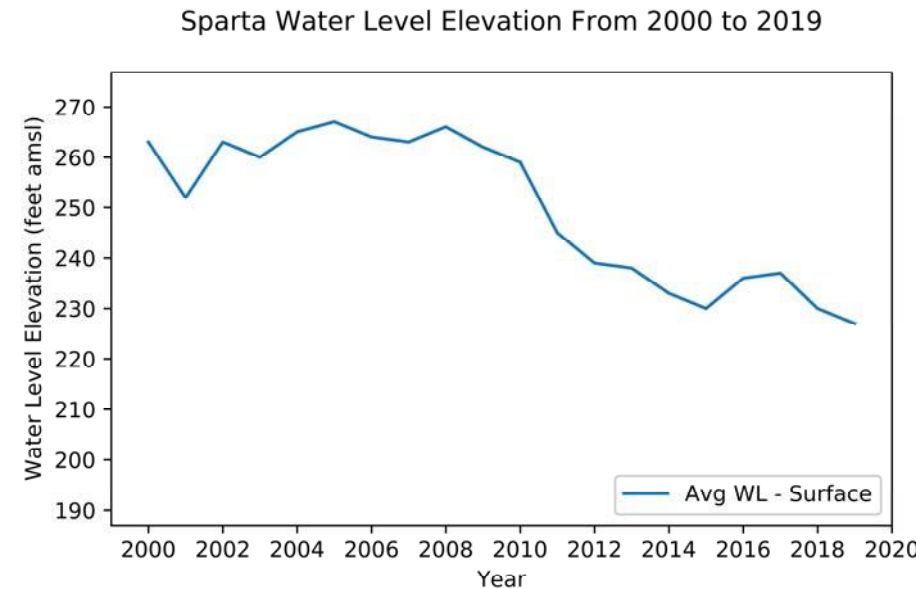
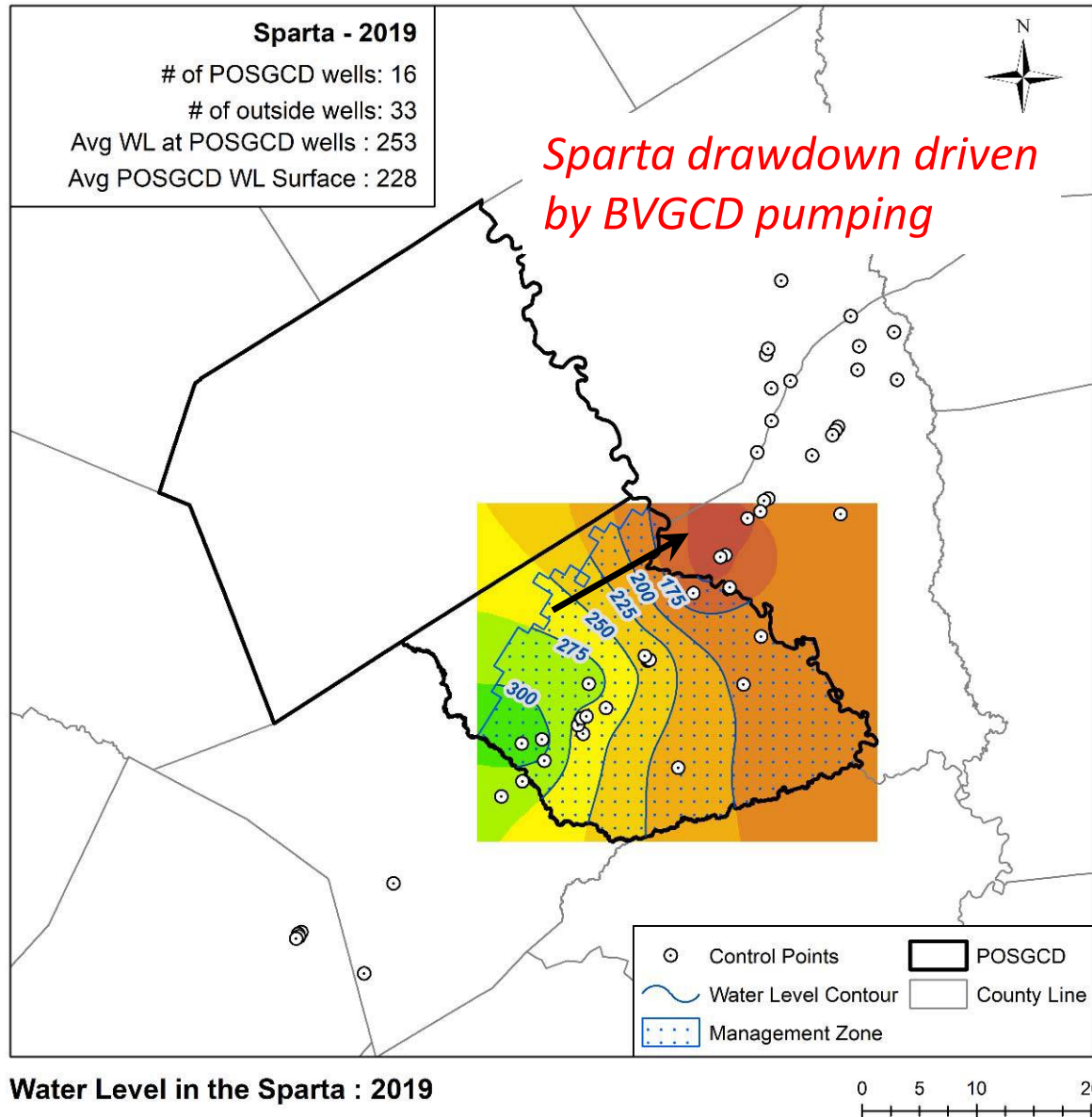
Sparta Discussion



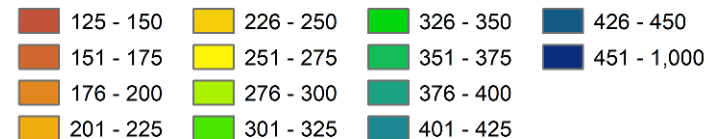
Sparta Discussion



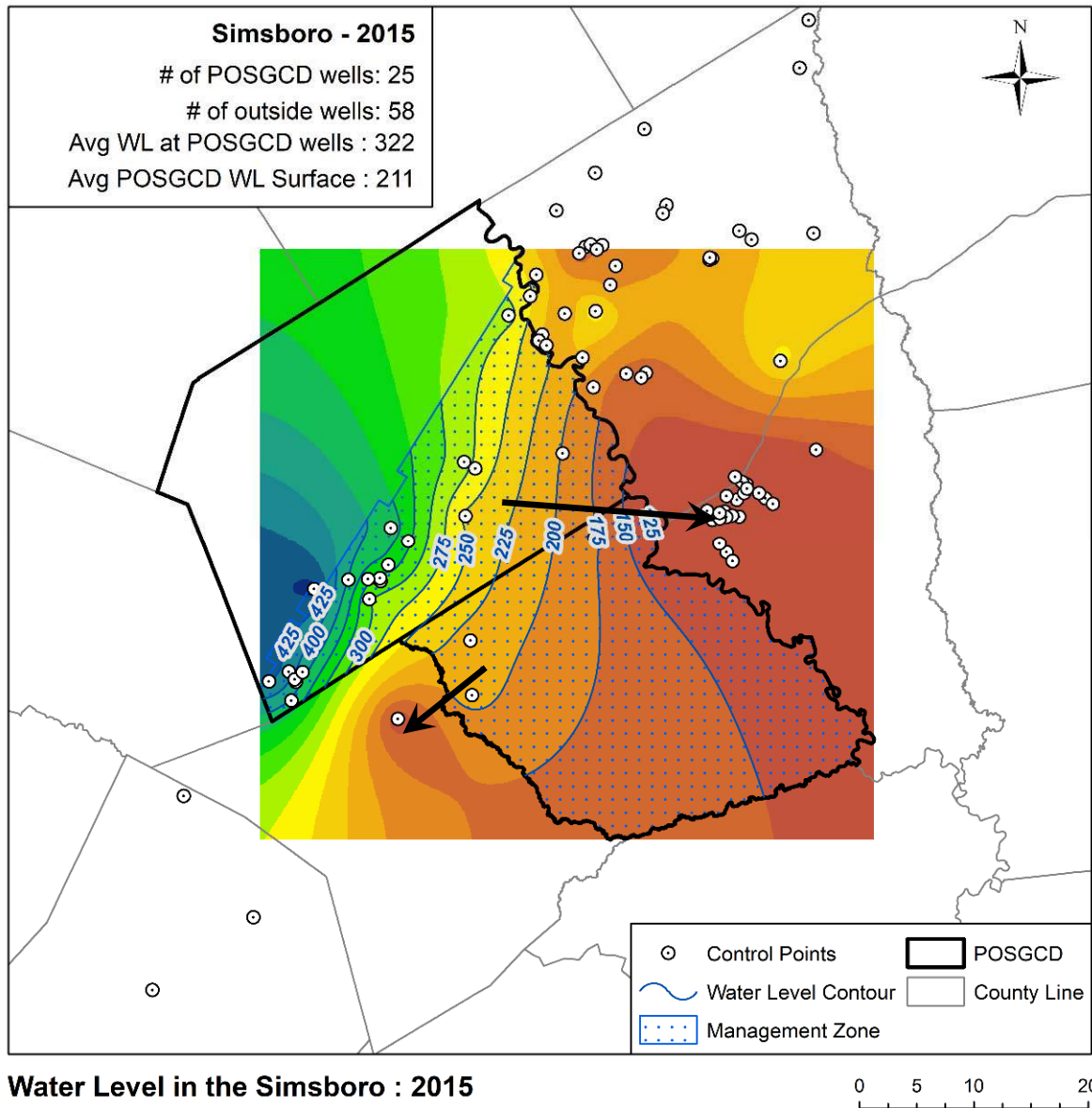
Sparta Discussion



Water Level in the Sparta : 2019

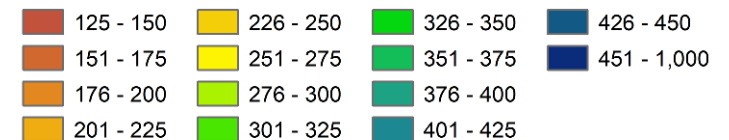


DFC Discussion – Simsboro



- *Aquifers don't end at the county line*
- *Pumping in neighboring GCDs can affect drawdown*

Water Level in the Simsboro : 2015



Future Work

- Check how well model represents behavior in Sparta
- Determine amounts & locations of POSGCD Sparta pumping (*Royalty Pecan, Somerville, Snook, Tunis, Lyons*)
- Test sensitivity of model to Sparta pumping changes inside & outside POSGCD
- Report findings

PDL Compliance

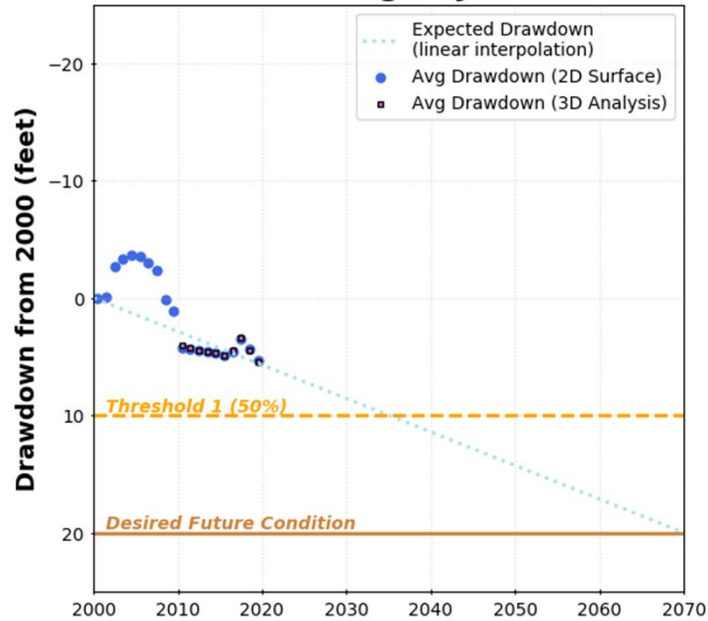
GCD or County	Average Aquifer Drawdown (ft) measured from January 2000 through December 2069					
	Sparta	Queen City	Carrizo	Calvert Bluff	Simsboro	Hooper
Post Oak Savannah GCD	20	20	20	20	20	20

GCD	Average Aquifer Drawdown (ft) measured from January 2010 through December 2069	
	Yegua-Jackson	
Post Oak Savannah GCD	20	

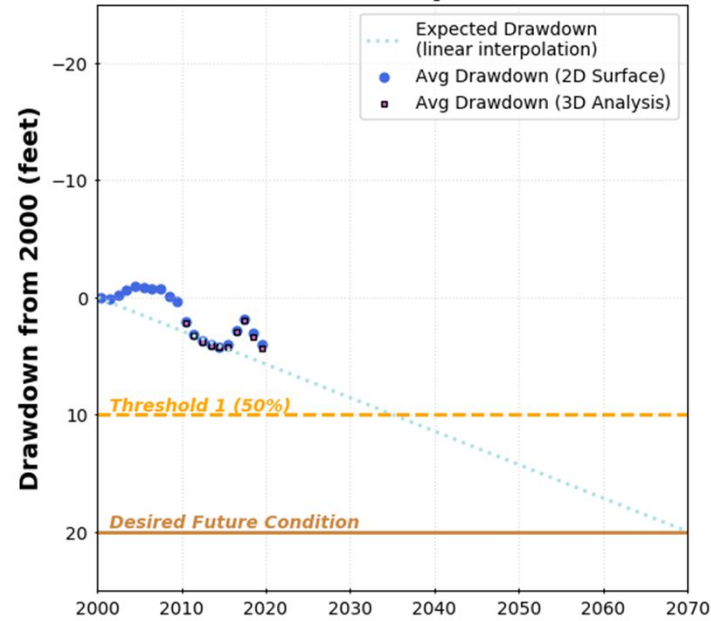
- **Protective Drawdown Limits (PDL) for internal POSGCD management**
- **NOT officially adopted by Groundwater Management Area 12 (yet)**

PDL Compliance

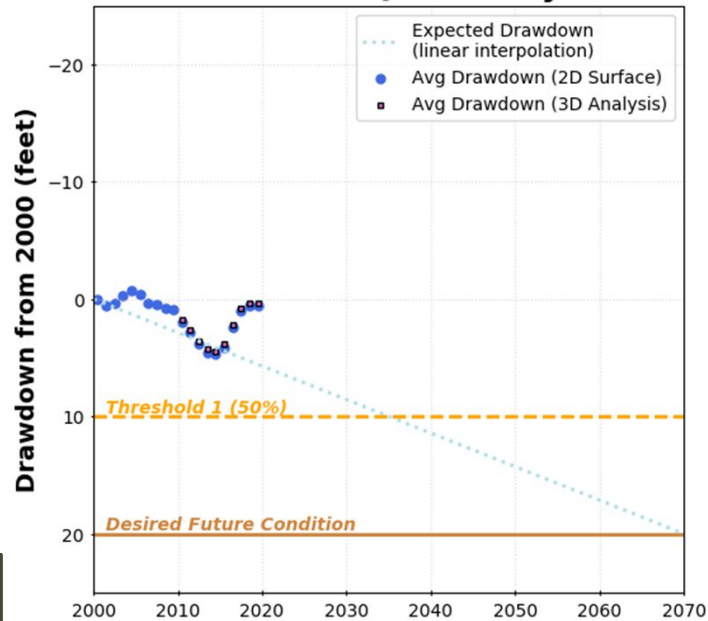
Shallow Yegua-Jackson



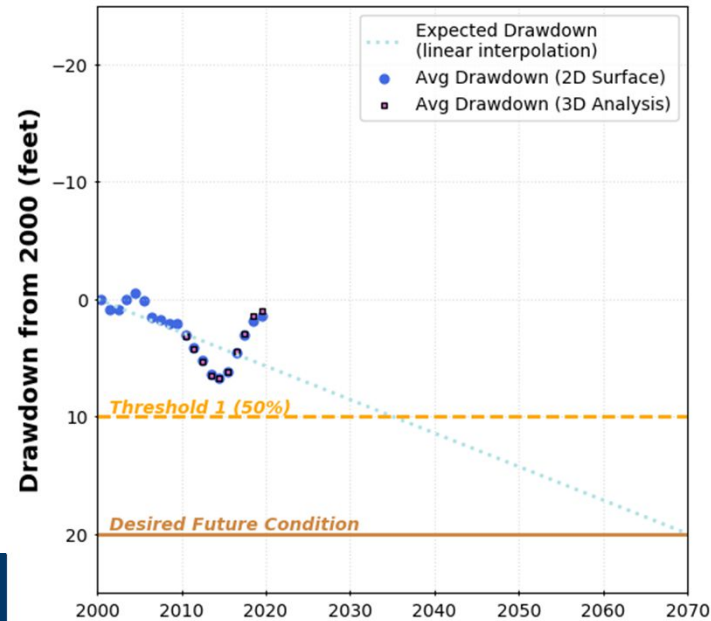
Shallow Sparta



Shallow Queen City

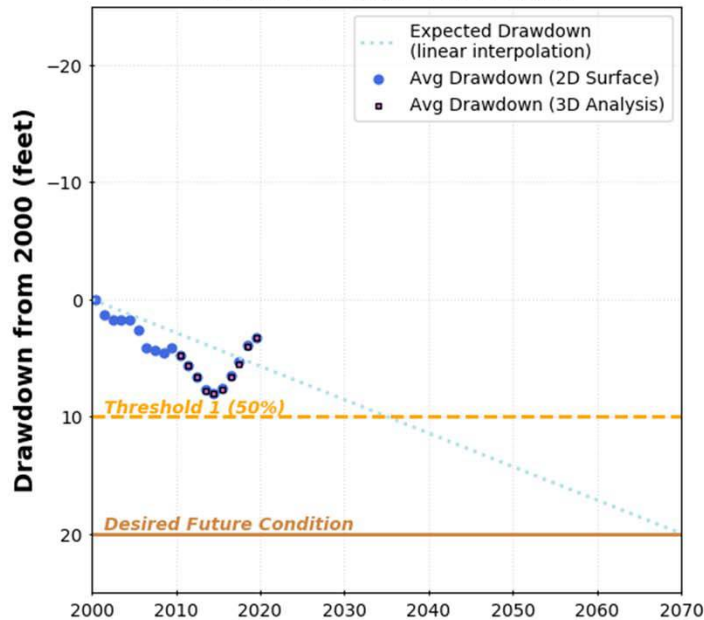


Shallow Carrizo

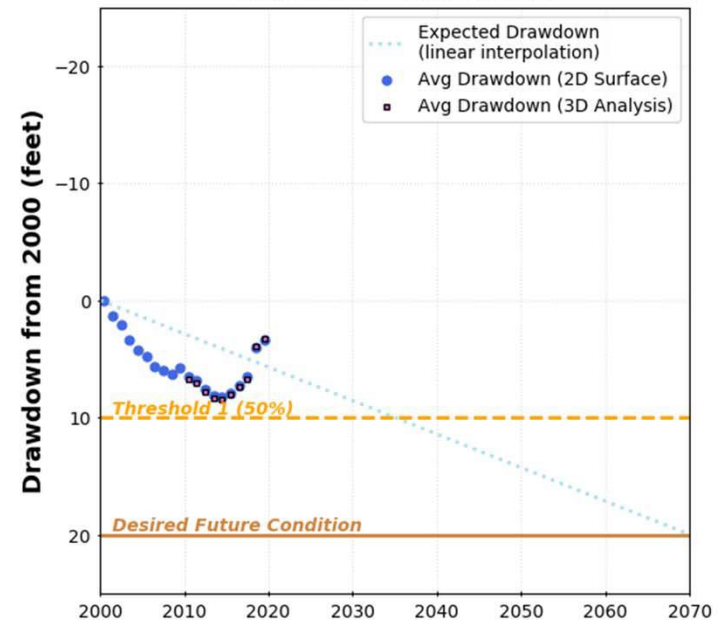


PDL Compliance

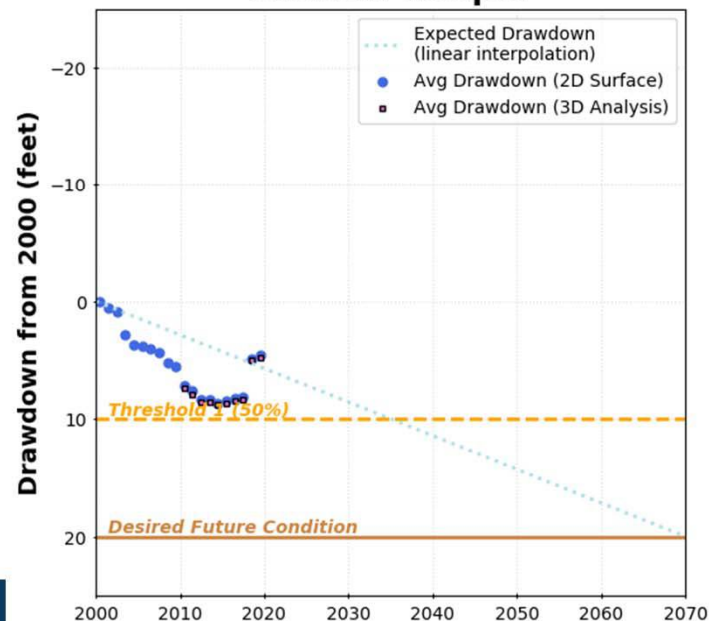
Shallow Calvert Bluff

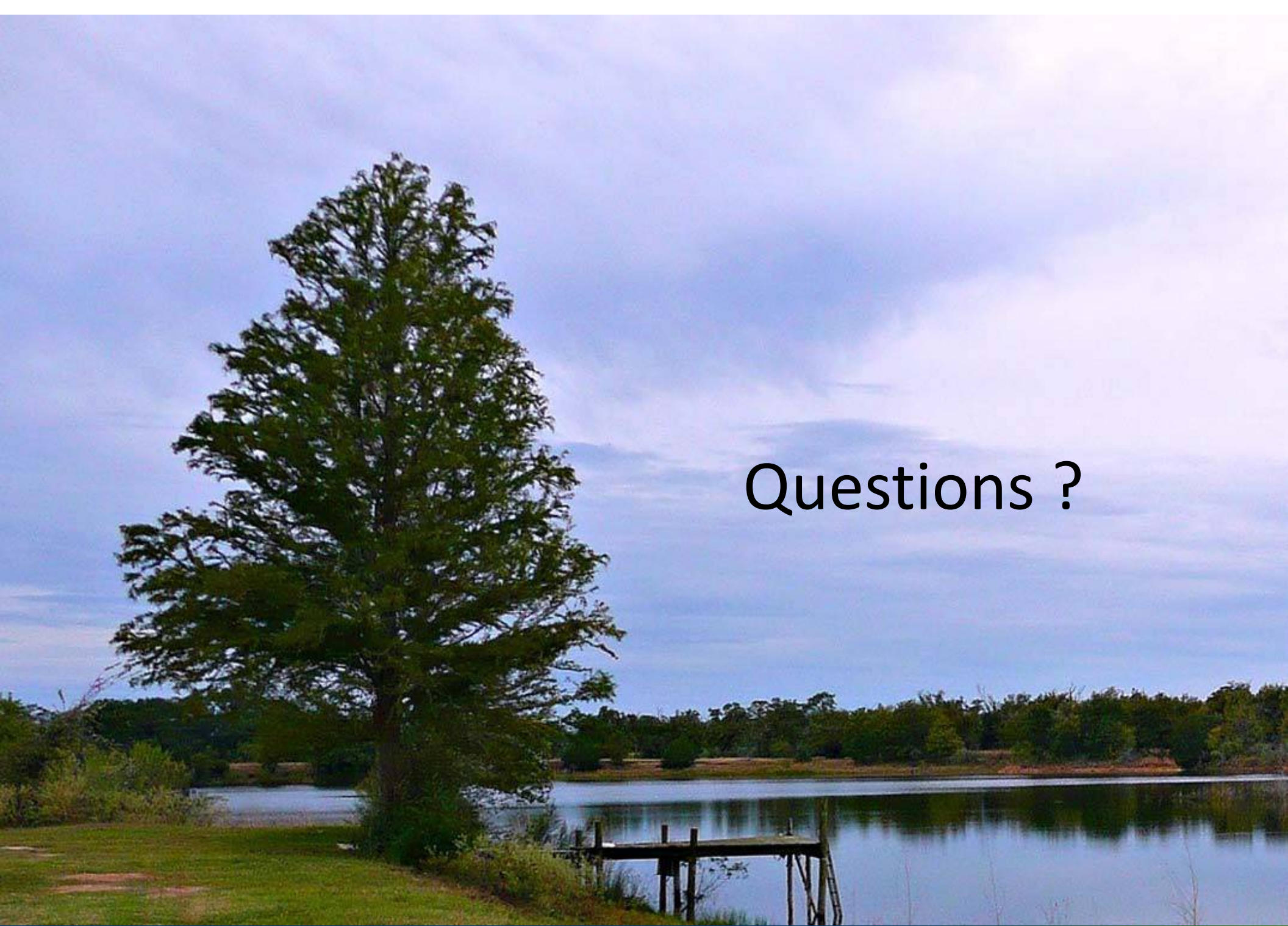


Shallow Simsboro



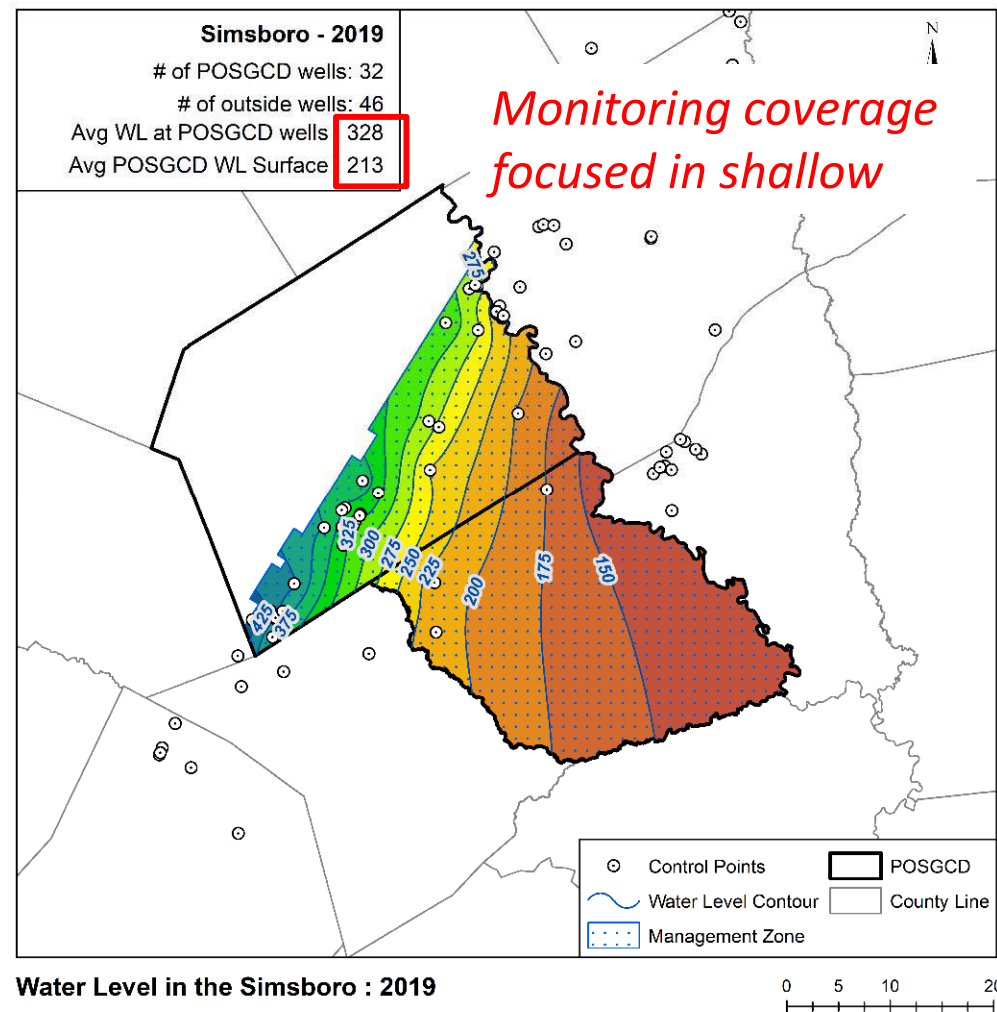
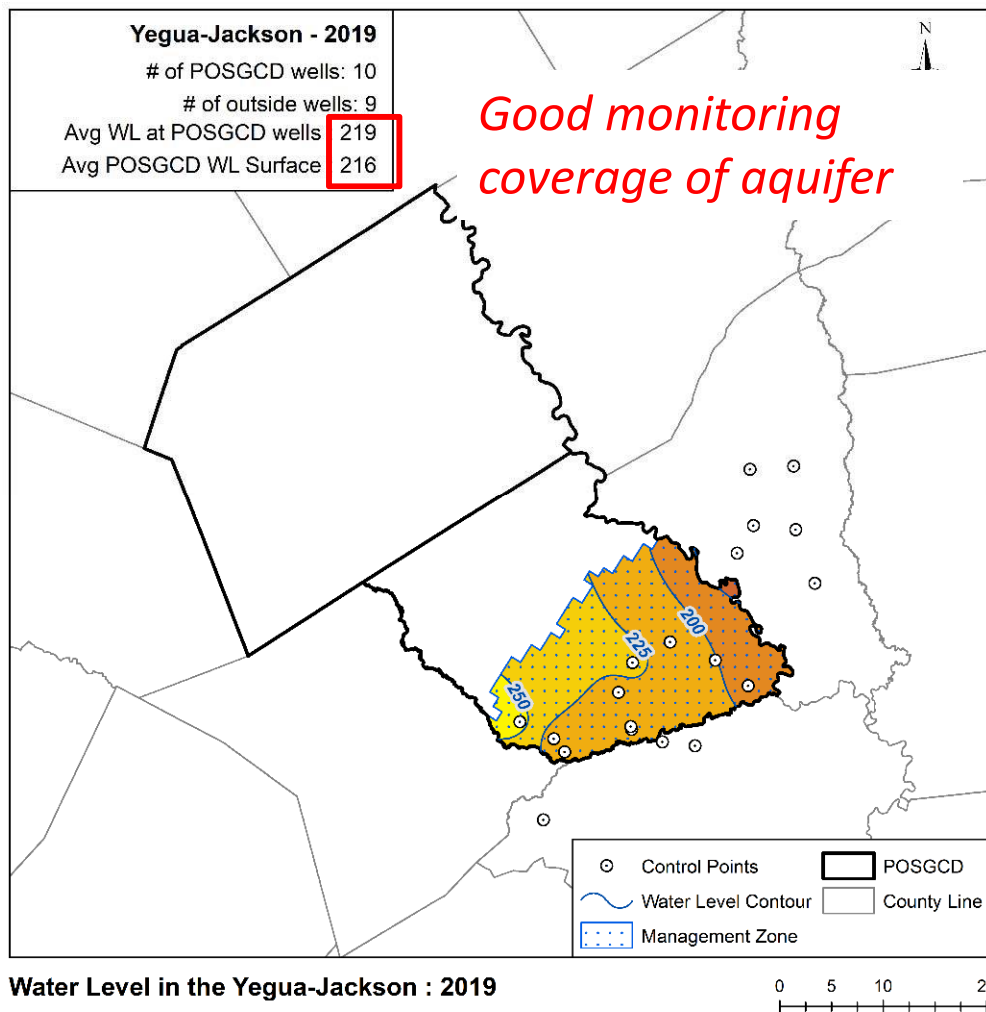
Shallow Hooper





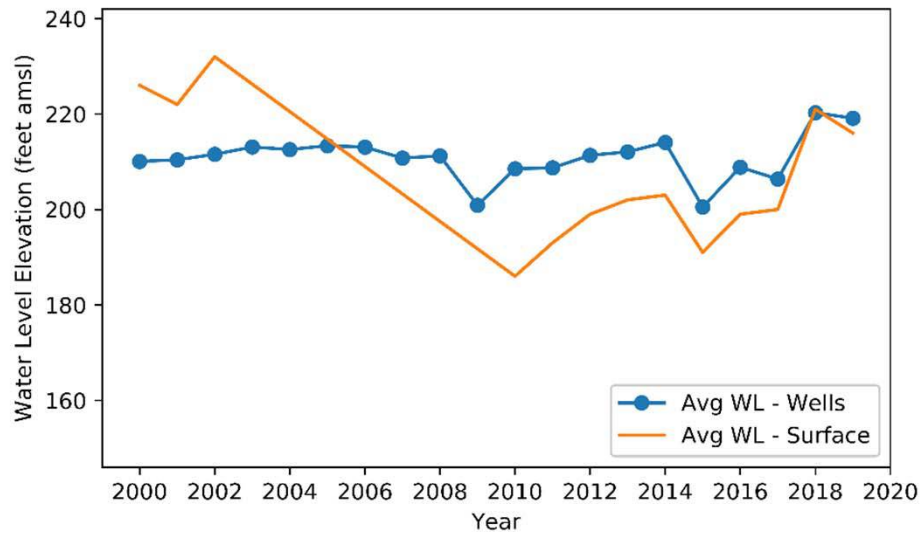
Questions ?

Annual Water Levels

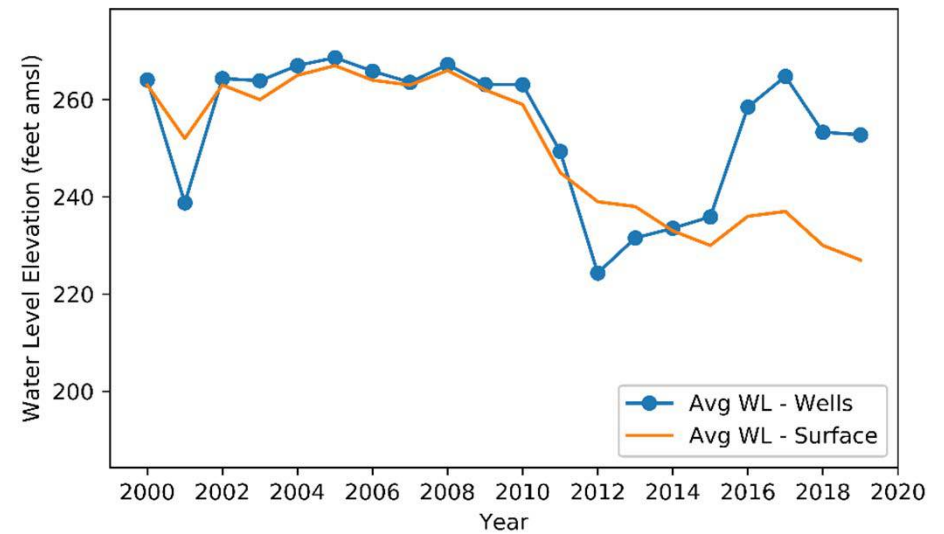


Annual Water Levels

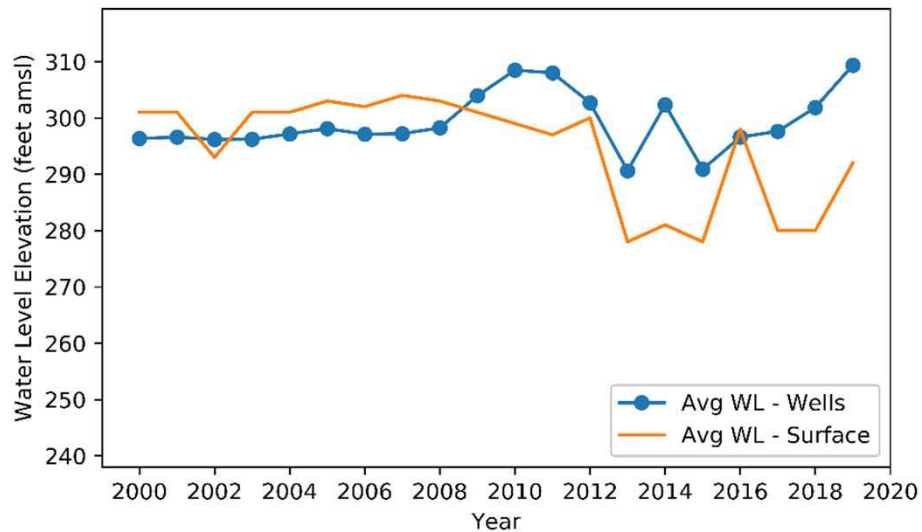
Yegua-Jackson Water Level Elevation From 2000 to 2019



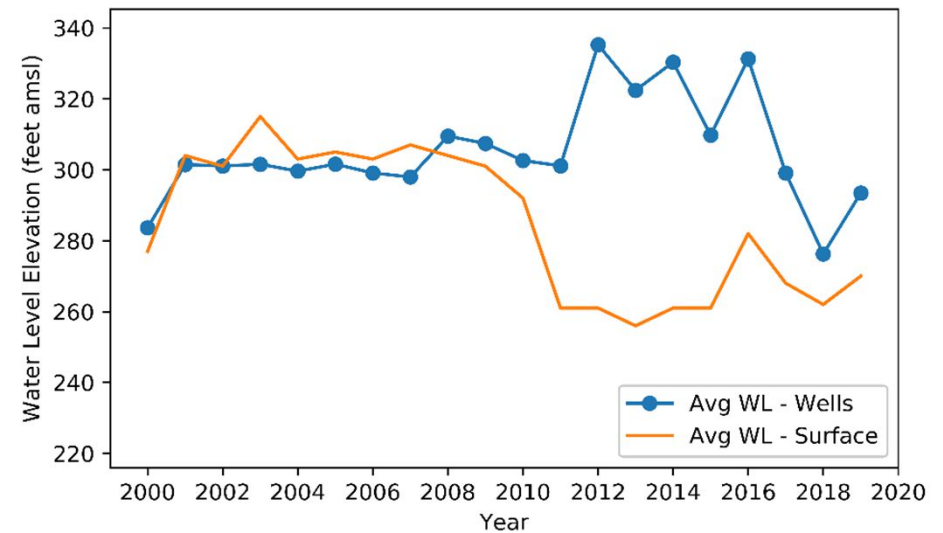
Sparta Water Level Elevation From 2000 to 2019



Queen City Water Level Elevation From 2000 to 2019

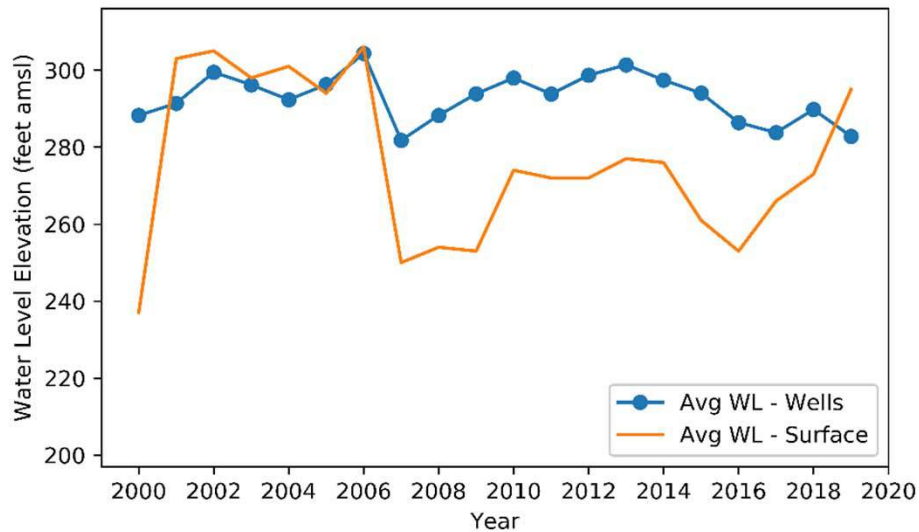


Carrizo Water Level Elevation From 2000 to 2019

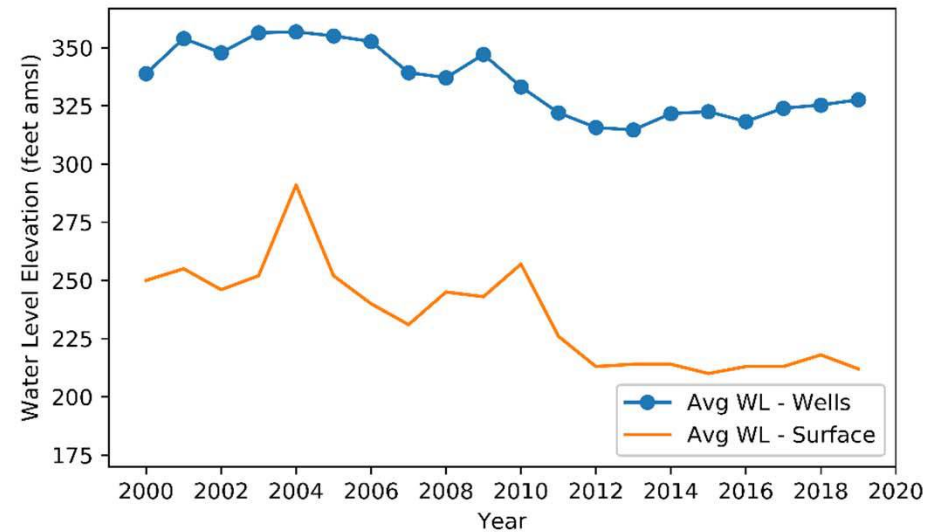


Annual Water Levels

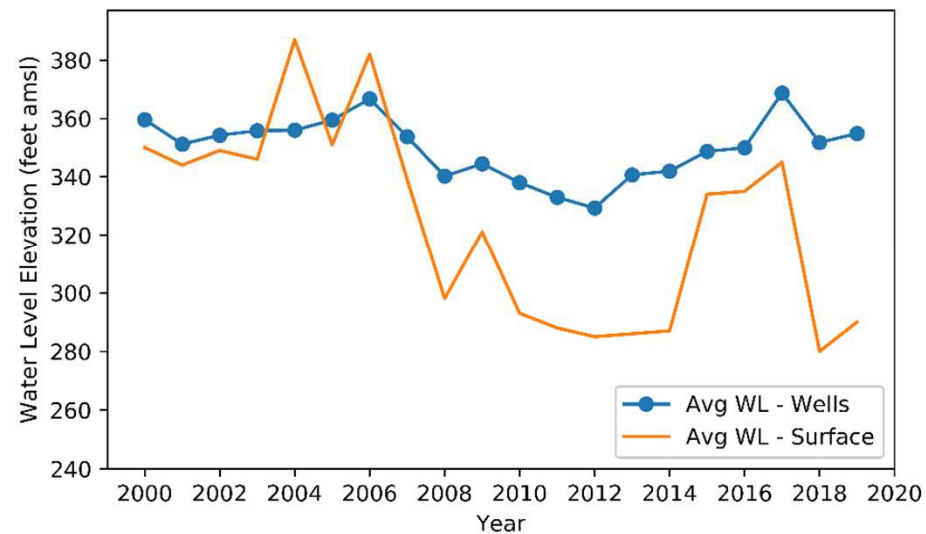
Calvert Bluff Water Level Elevation From 2000 to 2019



Simsboro Water Level Elevation From 2000 to 2019

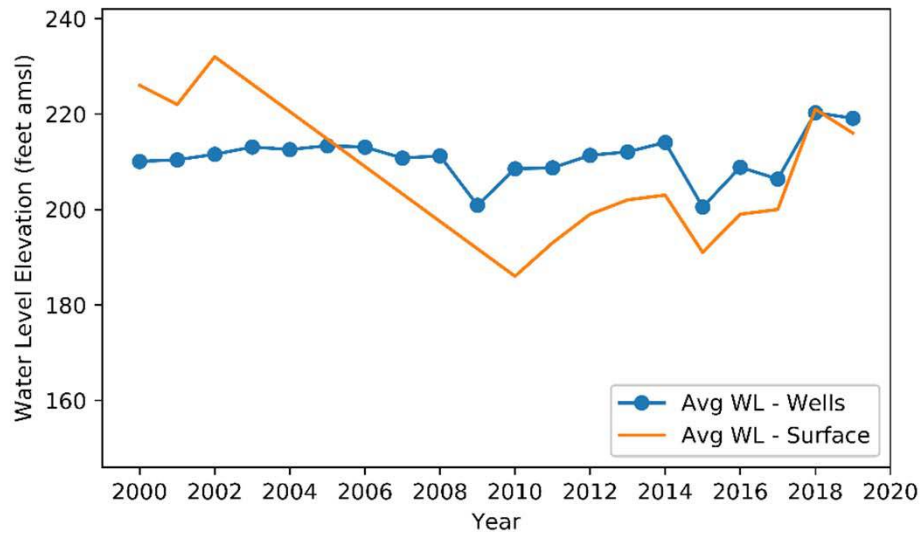


Hooper Water Level Elevation From 2000 to 2019

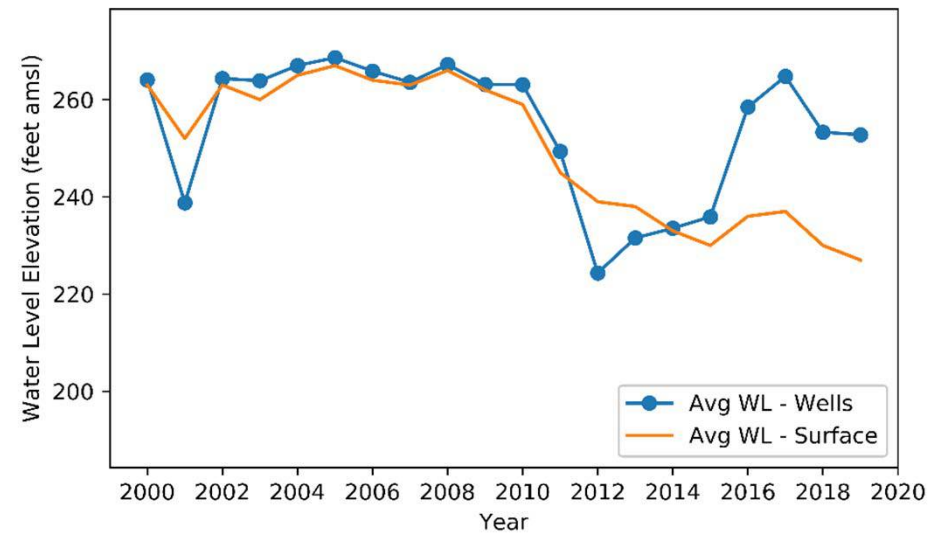


Shallow Water Levels

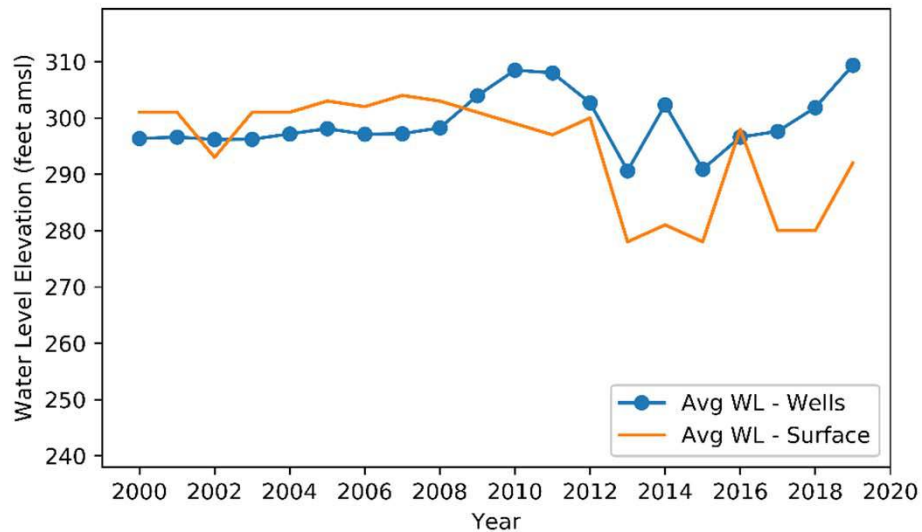
Yegua-Jackson Water Level Elevation From 2000 to 2019



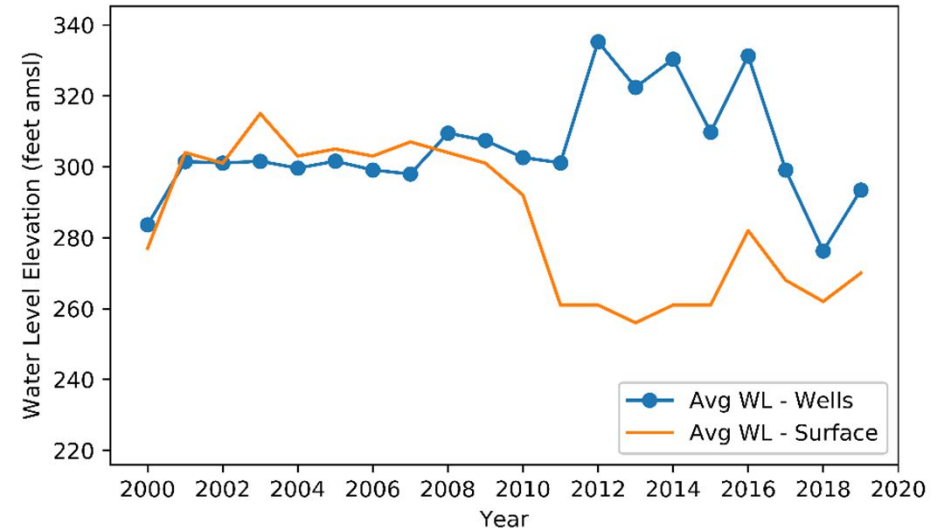
Sparta Water Level Elevation From 2000 to 2019



Queen City Water Level Elevation From 2000 to 2019

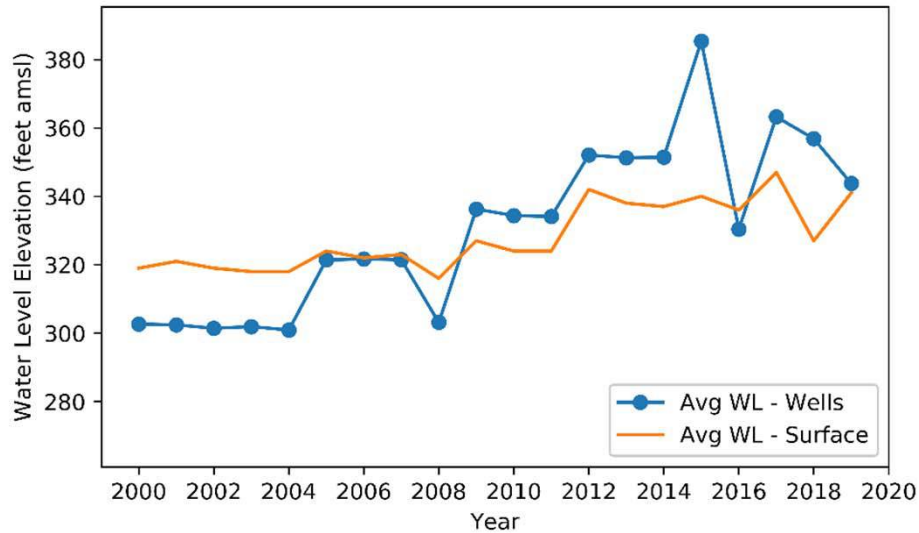


Carrizo Water Level Elevation From 2000 to 2019

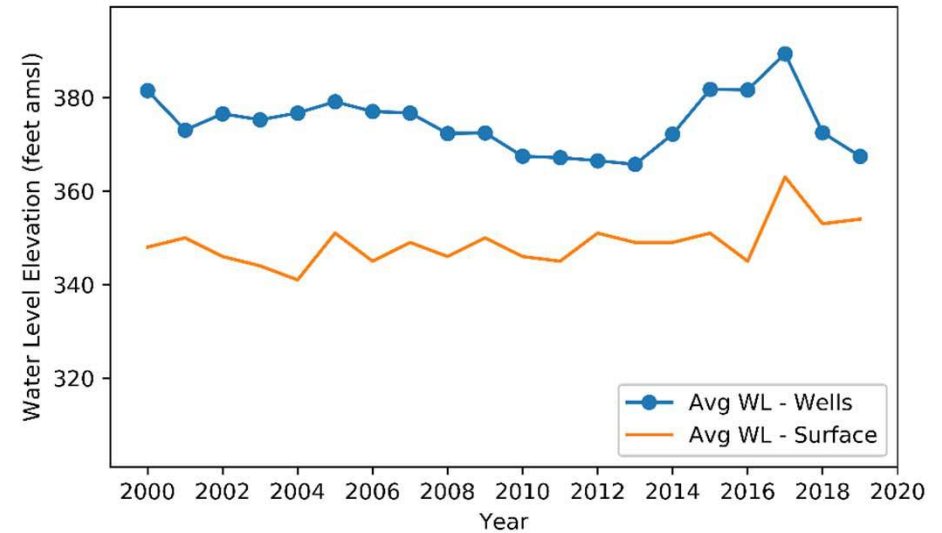


Shallow Water Levels

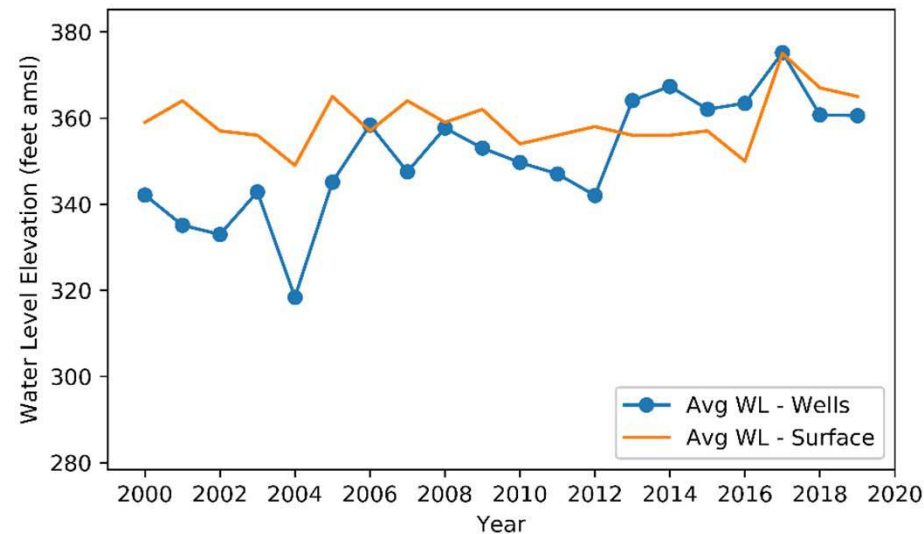
Calvert Bluff Water Level Elevation From 2000 to 2019



Simsboro Water Level Elevation From 2000 to 2019



Hooper Water Level Elevation From 2000 to 2019



Rules: Threshold 1

1. Threshold Level 1. Threshold Level 1 will be reached, and additional studies will be undertaken to evaluate the nature and extent of curtailment in groundwater production that may be required to achieve the District's management objectives inclusive of achieving DFCs and PDLs. The studies will, at a minimum, suggest possible schedules for reducing groundwater production in the affected management zone(s). The Threshold Level 1 actions will be conducted at such time as: [Amended June 12, 2012] [Amended May 3, 2017] [Amended July 2, 2019]
 - a. Total estimated annual production is greater than 60% of the Modeled Available Groundwater (MAG) value listed in Section 8 of the Management Plan;
 - b. An average groundwater drawdown, calculated from monitored water levels for an aquifer, is greater than 50% of the average groundwater drawdown provided in Section 7 of the Management Plan as a DFC for that;
 - c. The average groundwater drawdown, calculated from monitored water levels, for a Shallow Management Zone is greater than 50% of the threshold value, for average drawdown in that Shallow Management Zone, listed in Section 7 of the Management Plan; or
 - d. Projected average water level drawdowns, calculated with a District approved methodology, indicate that a DFC listed in Section 7 of the Management Plan will be exceeded within 15 years.

Rules: Threshold 2

2. Threshold Level 2. Threshold Level 2 will be reached, and a review of the Management Plan, rules and regulations will be initiated, and pending the results of Threshold Level 1 studies, the District will notify well owners of possible plans for curtailing groundwater production. The Threshold Level 2 actions will be conducted at such time as: [Amended June 12, 2012] [Amended May 3, 2017] [Amended July 2, 2019]
 - a. Total estimated annual production is greater than 70% of the Modeled Available Groundwater (MAG) value listed in Section 8 of the Management Plan; [Amended July 2, 2019]
 - b. Average groundwater drawdown, calculated from monitored water levels, for an aquifer is greater than 60% of the average groundwater drawdown listed in Section 7 of the Management Plan as the DFC for that aquifer; or
 - c. The average groundwater drawdown, calculated from monitored water levels, for a Shallow Management Zone, is greater than 60% of the threshold value for average drawdown listed in Section 7 of the Management Plan for that Shallow Management Zone;

Rules: Threshold 3

3. Threshold Level 3. Threshold Level 3 will be reached, and the Board will consider and adopt amendments to the Management Plan, rules and regulations at such time as the average groundwater drawdown, calculated from monitored water levels, for an aquifer is greater than 75% of an average groundwater drawdown listed in Section 7 of the Management Plan as a DFC for that aquifer or PDL for the shallow portion of that aquifer. The District anticipates that one of the adopted amendments will include one or more strategies for the District's curtailment of groundwater production in the affected management zone(s).
[Amended June 12, 2012] [Amended May 3, 2017] [Amended July 2, 2019]