Update of Preliminary Groundwater Modeling Results

PRESENTED TO:

GROUNDWATER MANAGEMENT AREA 12

FEBRUARY 25, 2015

REVISED: MARCH 6, 2015, APRIL 14, 2015

Model Simulations

- Assemble data to update groundwater pumping in model from 1999 through 2010 for GMA 12.
- Utilize Central Queen City-Sparta GAM extended to 2070 for simulations.
- Comparison of results to current desired future conditions.

Model Simulations (cont'd)

Predictive Scenario 1 (PS1)

- Perform model simulation from 2000 to 2070 based on current permits within the GCDs being fully utilized beginning in 2015.
- Develop estimates of average drawdown in 2070 from 2000 by aquifer and GCD.

Model Simulations (cont'd)

Predictive Scenario 2 (PS2)

- Utilizing current permits within each GCD, estimate the ramp up in pumping beginning in 2015 to 2070. Gradual increases in pumping mainly controlled by increases in public supply water usage.
- Perform simulation to calculate average drawdown in 2070 from 2000.

Model Simulations (cont'd)

Predictive Scenario 3 (PS3)

- Update of PS1
- Updated pumping numbers by LPGCD and FCGCD
- Confirmed pumping numbers by BVGCD and METGCD
- POSGCD pumping numbers remain preliminary
- Perform simulation to calculate average drawdown in 2070 from 2000.

Model Simulations (cont'd)

Predictive Scenario 4 (PS4)

- Update of PS2
- Updated pumping numbers by LPGCD and FCGCD
- Confirmed pumping numbers by BVGCD and METGCD
- POSGCD pumping numbers remain preliminary
- Perform simulation to calculate average drawdown in 2070 from 2000.

Current MAGs

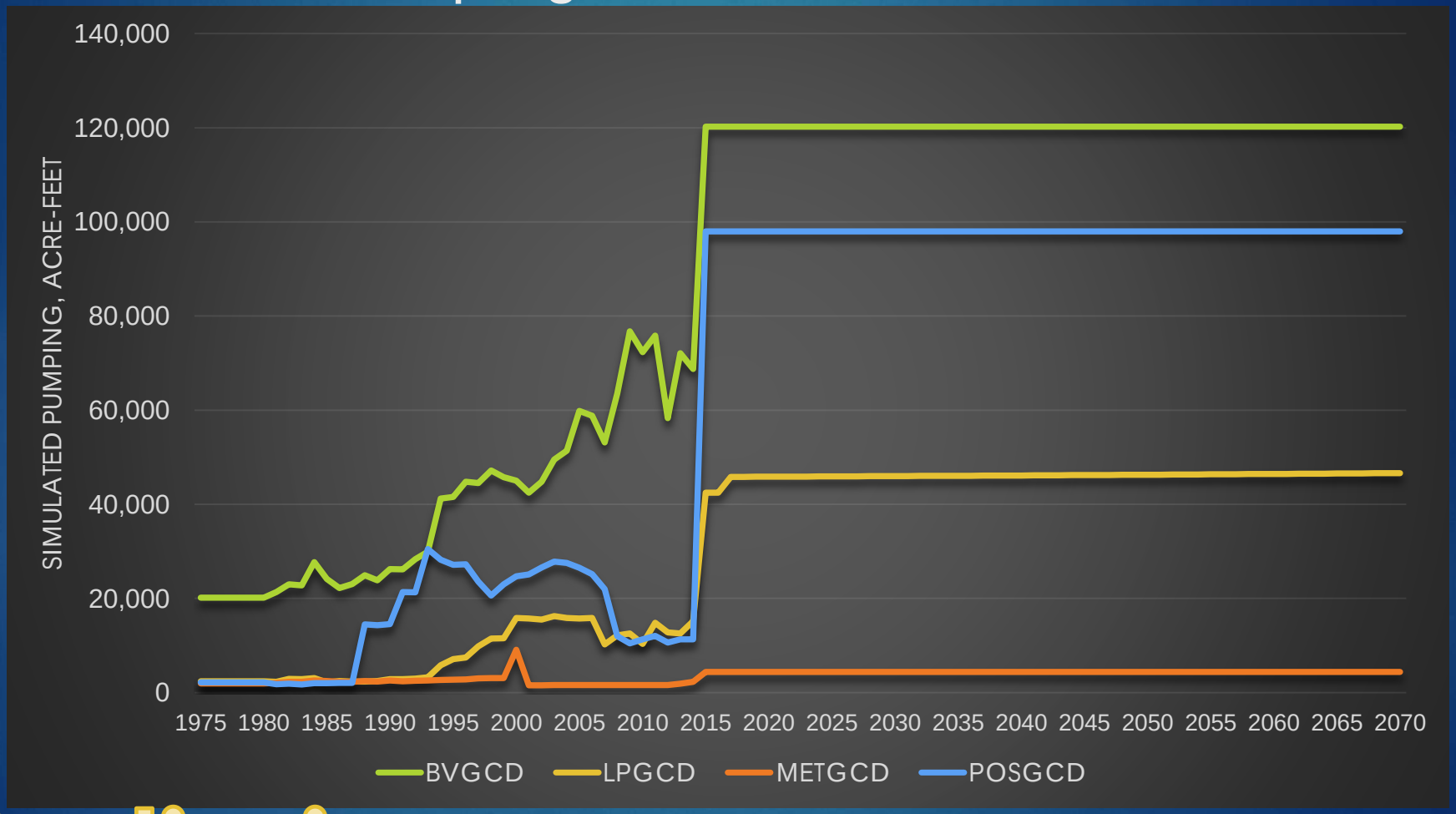
From 2010 planning

Year 2060 Managed Available Groundwater in Acre-Feet

District	Brazos River Alluvium	Carrizo	Calvert Bluff	Simsboro	Hooper	Queen City	Sparta	Yegua-Jackson	Total
Brazos Valley	-	5,496	1,755	96,185	316	529	7,923	7,071	119,275
Fayette County	-	1,000	-	-	-	570	3,729	5,762	11,061
Lost Pines	-	12,052	3,985	37,249	2,592	1,133	1,877	-	58,888
Mid-East Texas	-	11,088	3,912	7,170	827	974	3,334	1,122	28,427
Post Oak Savannah	25,138	7,059	1,038	48,501	4,422	502	6,734	12,923	106,377
GMA 12	-	36,695	10,690	189,105	8,157	3,688	23,597	26,878	323,968

Predictive Scenario 1

Simsboro Pumping



Preliminary

Predictive Scenario 1 Pumping

Year 2070 in Acre-Feet

District	Carrizo	Calvert Bluff	Simsboro	Hooper	Queen City	Sparta	Total
Brazos Valley	4,748	3,184	120,252	1,831	1,157	9,228	140,400
Fayette County	1,000	-	-	-	1,857	7,249	10,107
Lost Pines	17,091	4,056	46,621	673	2,648	872	71,962
Mid-East Texas	2,852	6,345	4,380	5,550	1,249	5,112	25,488
Post Oak Savannah	17,841	1,486	98,079	5,321	385	1,862	124,974
GMA 12	43,533	15,071	269,333	13,375	7,296	24,322	372,931

Preliminary

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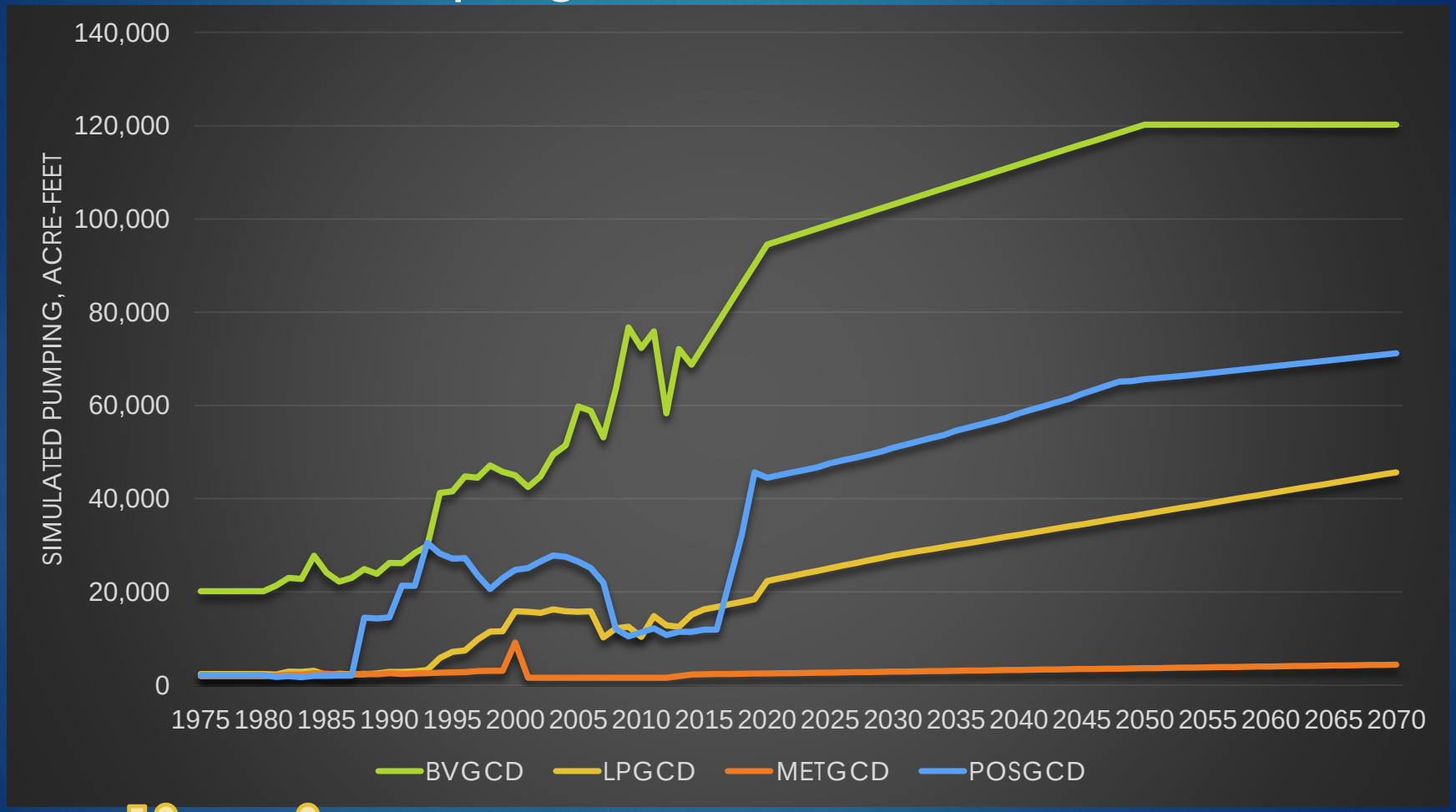
Predictive Scenario 2

Simsboro Pumping



Preliminary

Predictive Scenario 2 Pumping

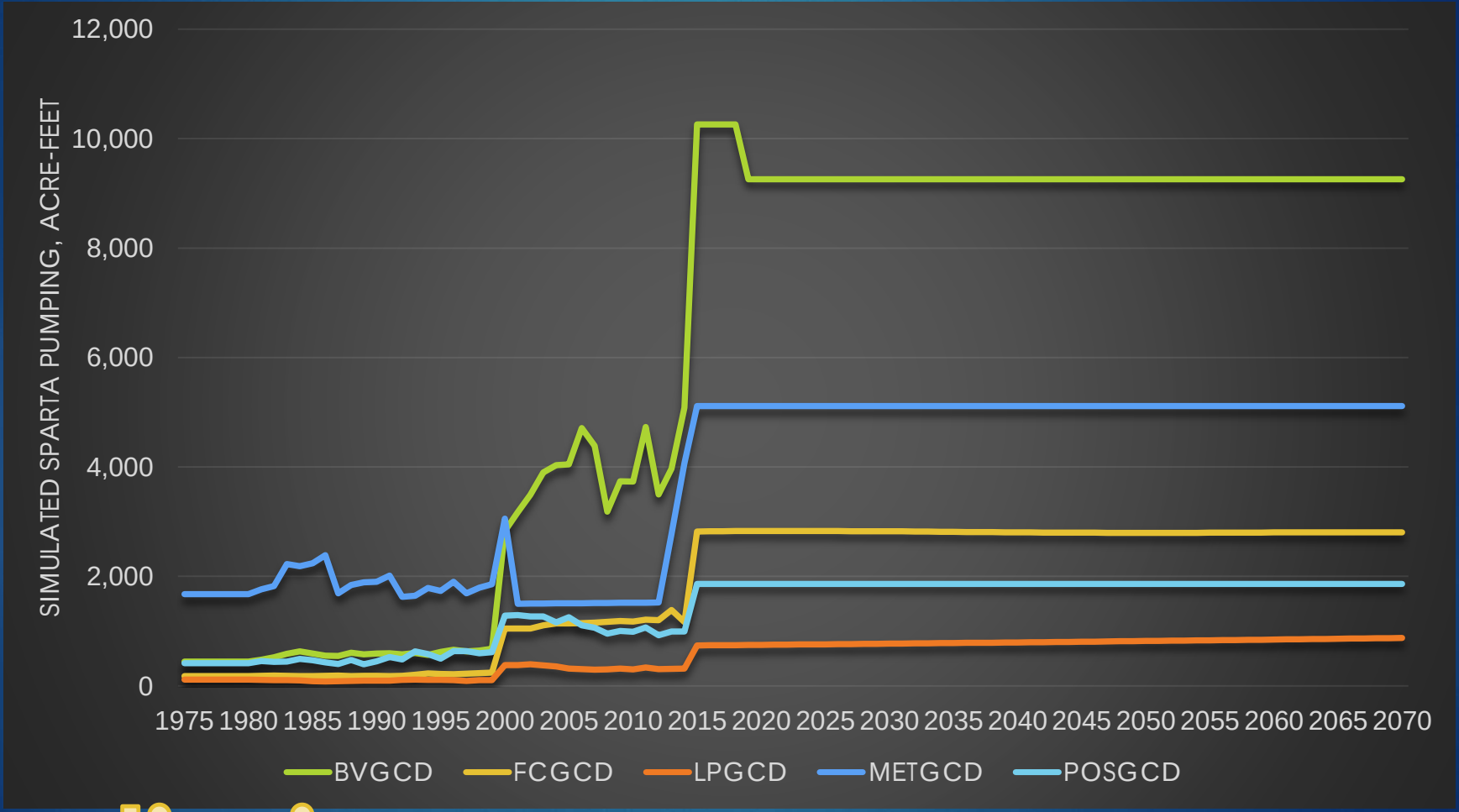
Year 2070 in Acre-Feet

District	Carrizo	Calvert Bluff	Simsboro	Hooper	Queen City	Sparta	Total
Brazos Valley	4,748	3,184	120,252	1,831	1,157	9,228	140,400
Fayette County	1,000	-	-	-	1,857	7,249	10,107
Lost Pines	11,509	3,906	45,213	673	1,084	565	62,949
Mid-East Texas	2,851	6,305	4,342	5,527	1,245	5,093	25,363
Post Oak Savannah	9,604	575	70,926	3,059	490	1,577	86,231
GMA 12	29,712	13,970	240,734	11,090	5,833	23,712	325,051

Preliminary

Predictive Scenario 3

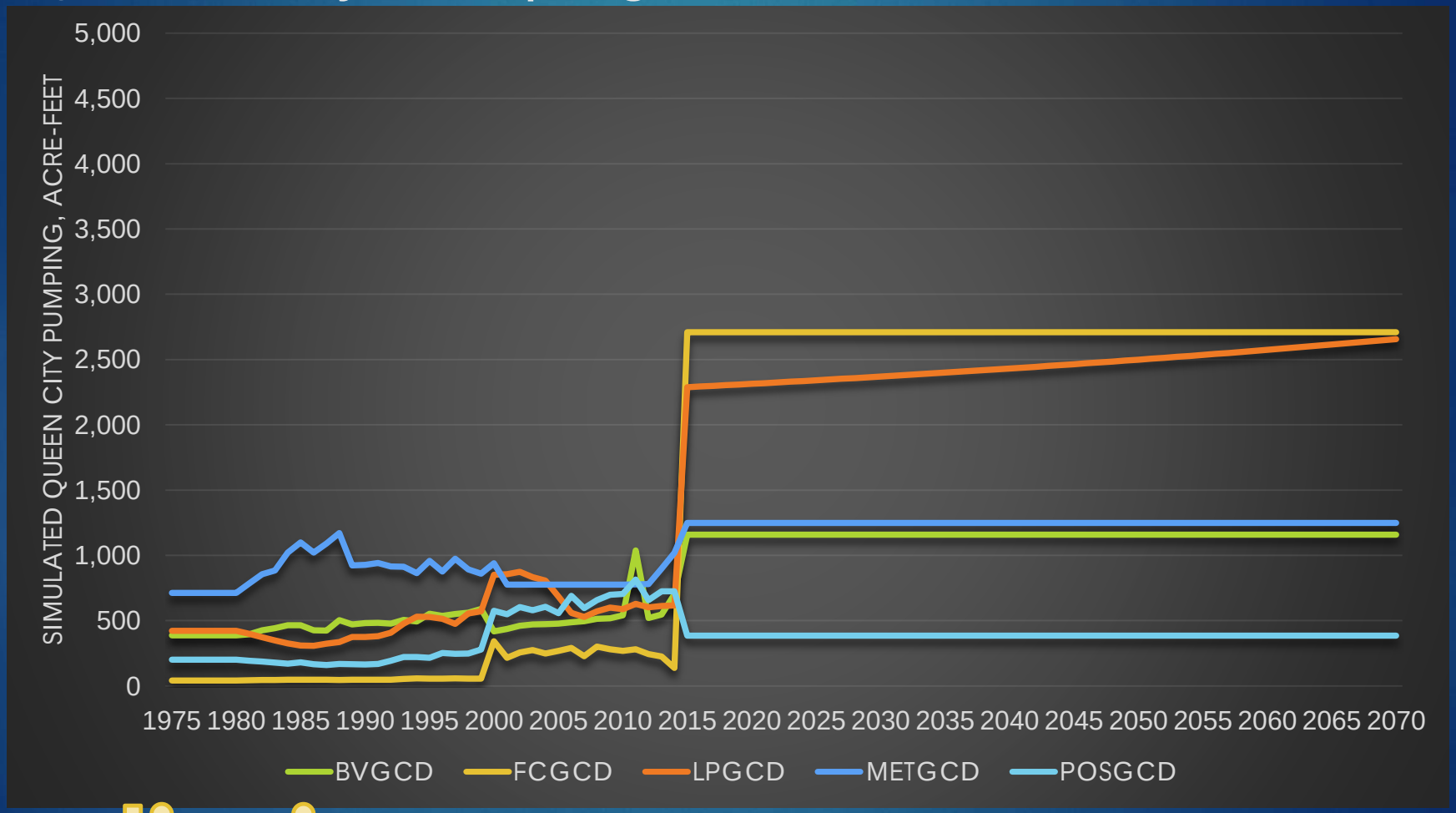
Sparta Pumping



Preliminary

Predictive Scenario 3

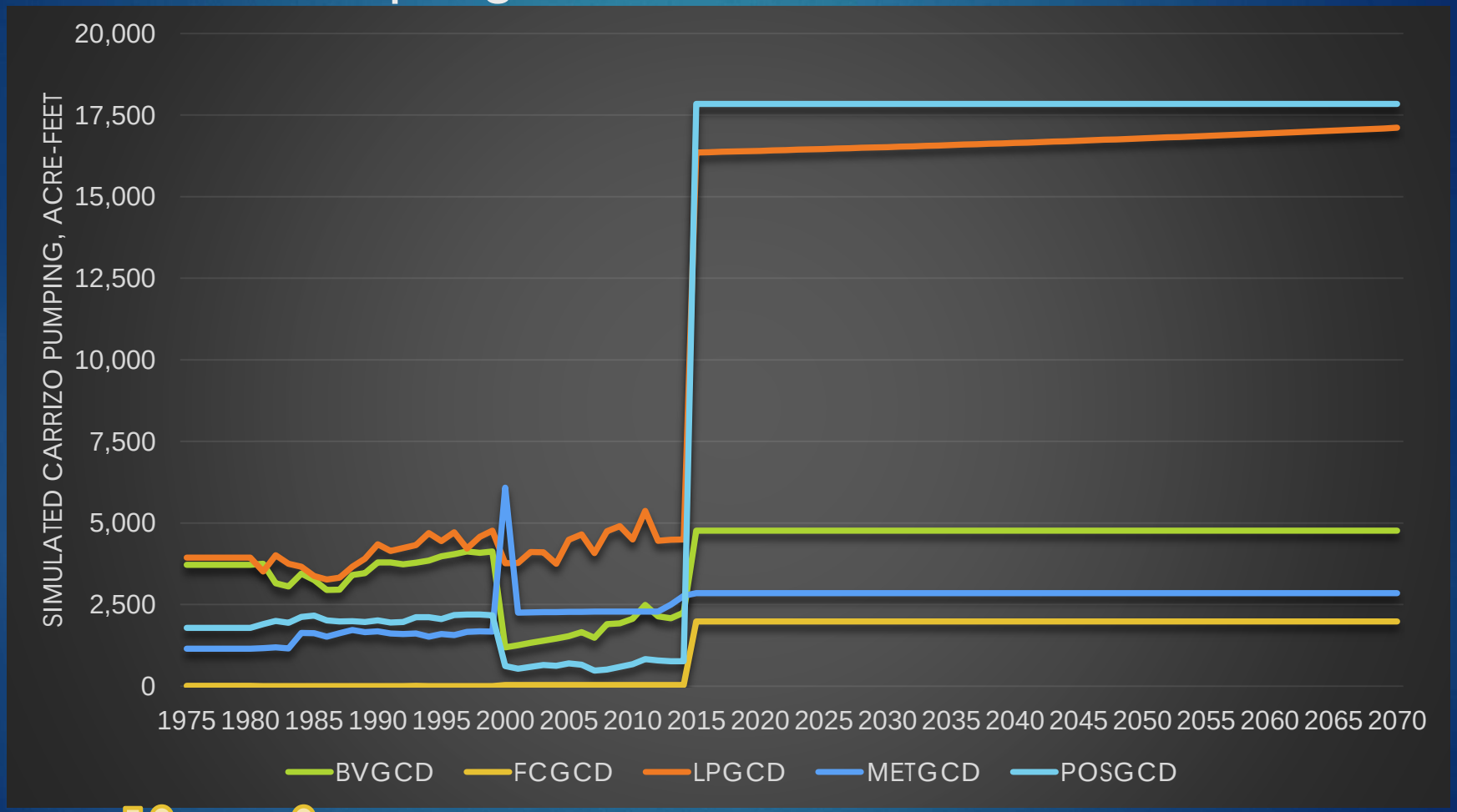
Queen City Pumping



Preliminary

Predictive Scenario 3

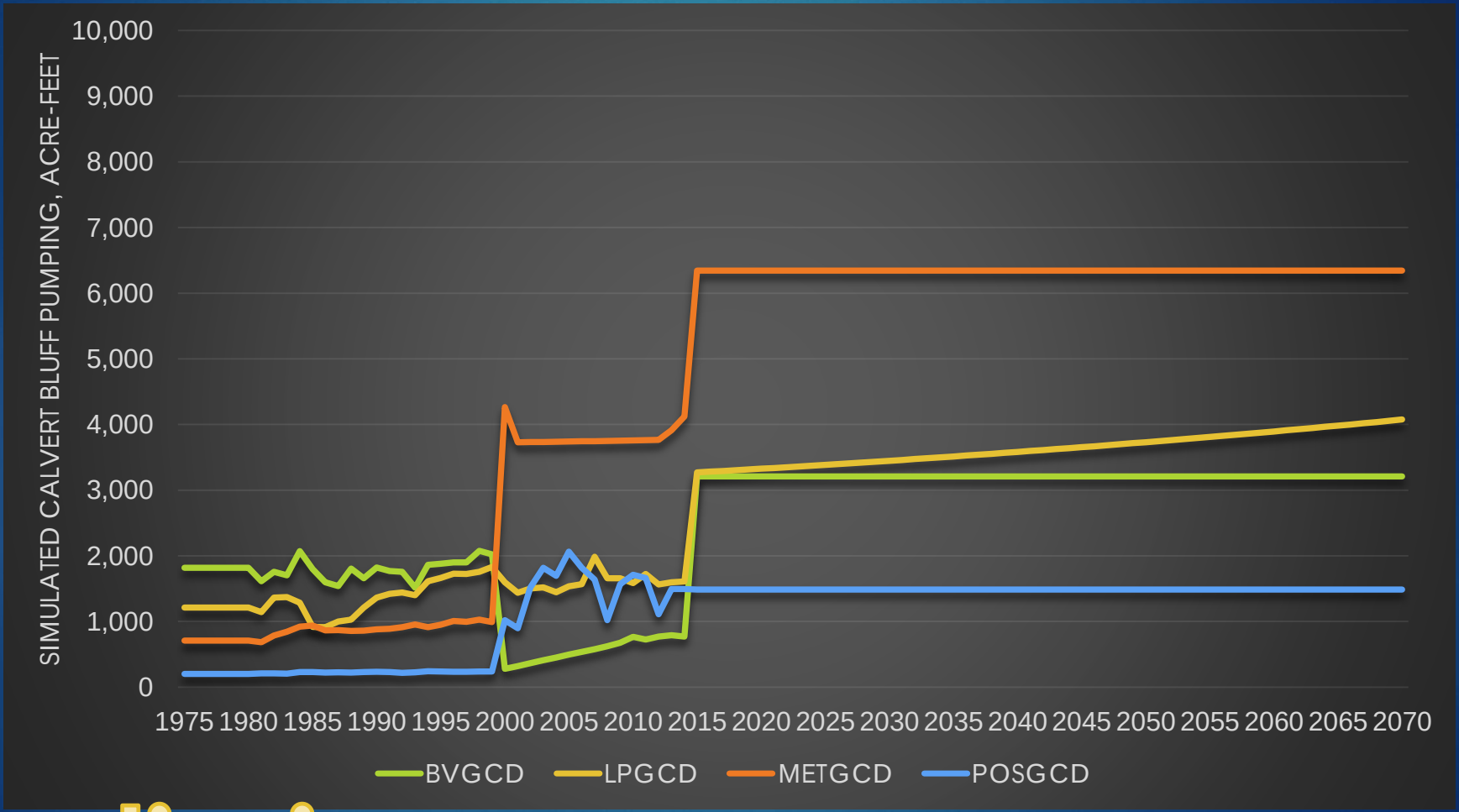
Carrizo Pumping



Preliminary

Predictive Scenario 3

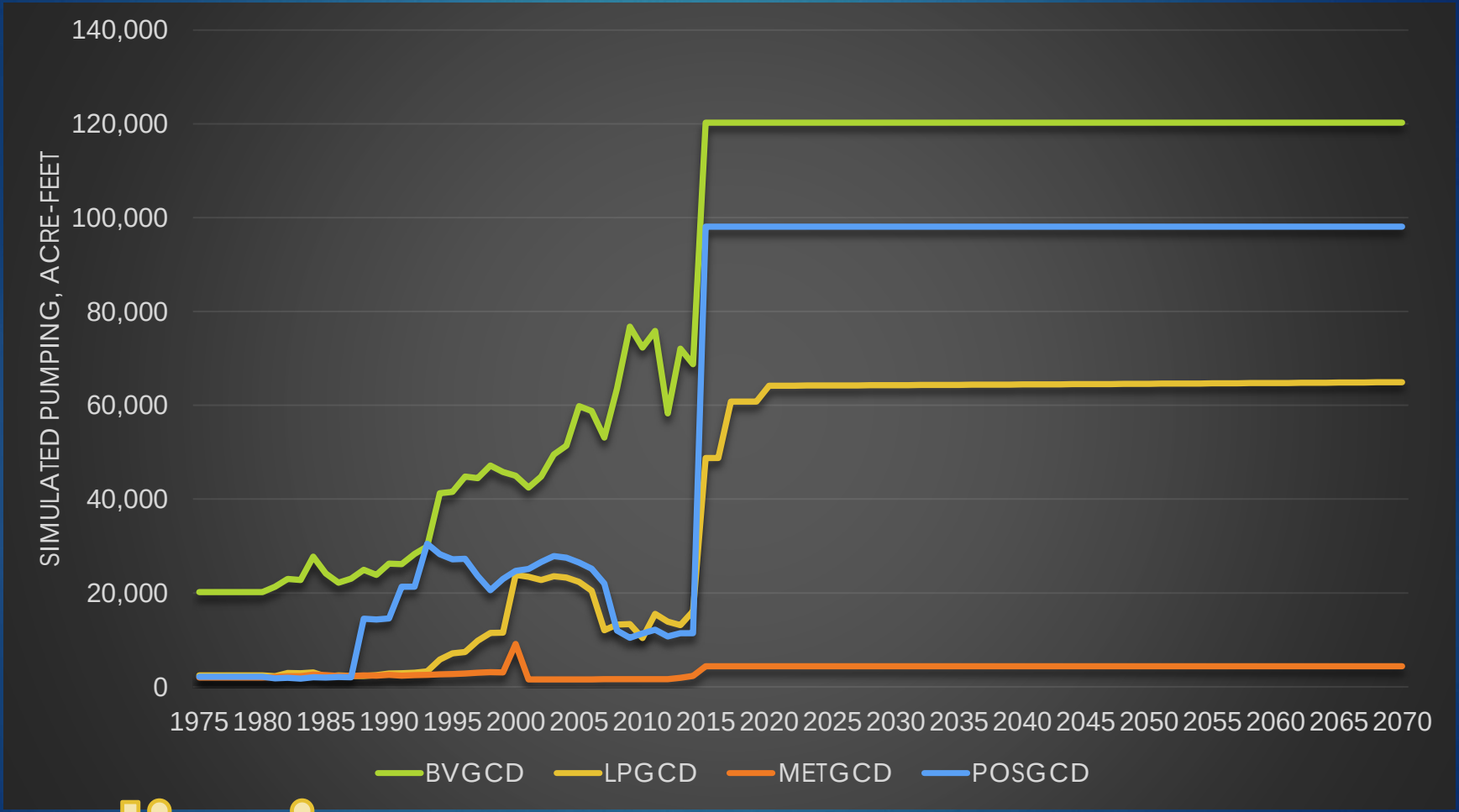
Calvert Bluff Pumping



Preliminary

Predictive Scenario 3

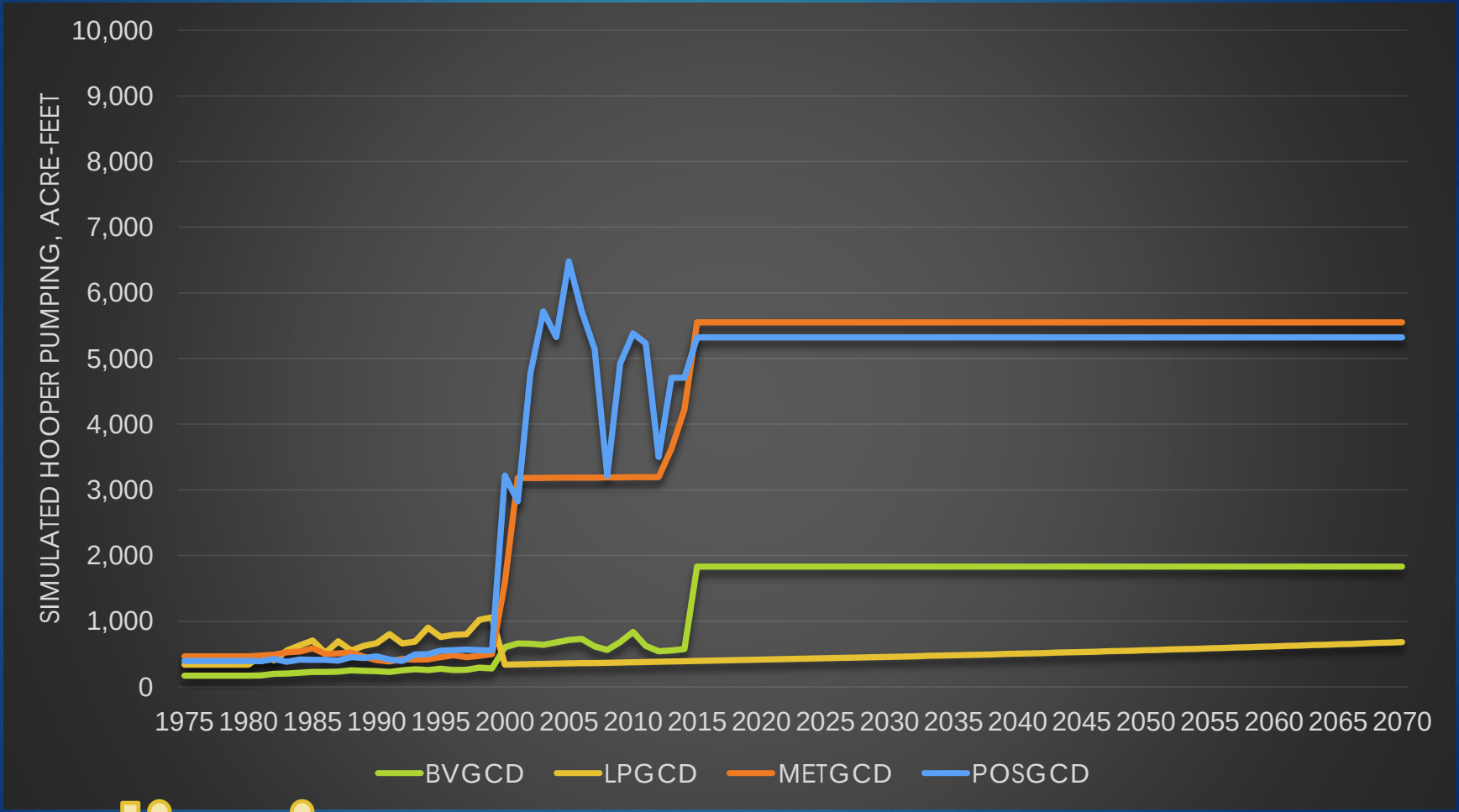
Simsboro Pumping



Preliminary

Predictive Scenario 3

Hooper Pumping



Preliminary

Predictive Scenario 3 Pumping

Year 2070 in Acre-Feet

District	Carrizo	Calvert Bluff	Simsboro	Hooper	Queen City	Sparta	Total
Brazos Valley	4,765	3,207	120,262	1,832	1,158	9,259	140,485
Fayette County	1,985	-	-	-	2,709	2,802	7,496
Lost Pines	17,092	4,057	64,926	673	2,648	872	90,269
Mid-East Texas	2,852	6,345	4,380	5,550	1,249	5,112	25,488
Post Oak Savannah	17,841	1,486	98,079	5,321	385	1,862	124,974
GMA 12	44,536	15,095	287,648	13,376	8,149	19,907	388,711

Preliminary

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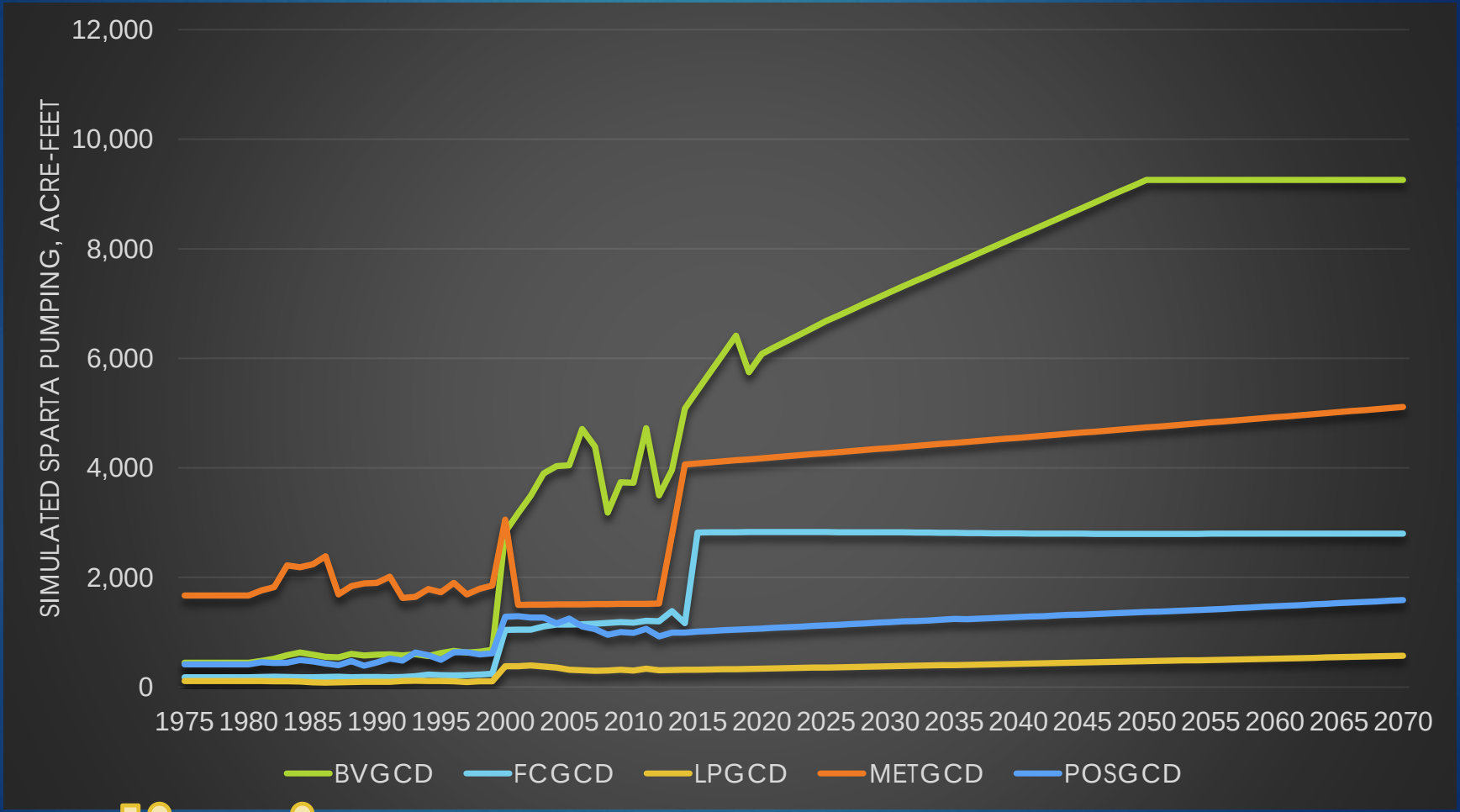
Predictive Scenario 4

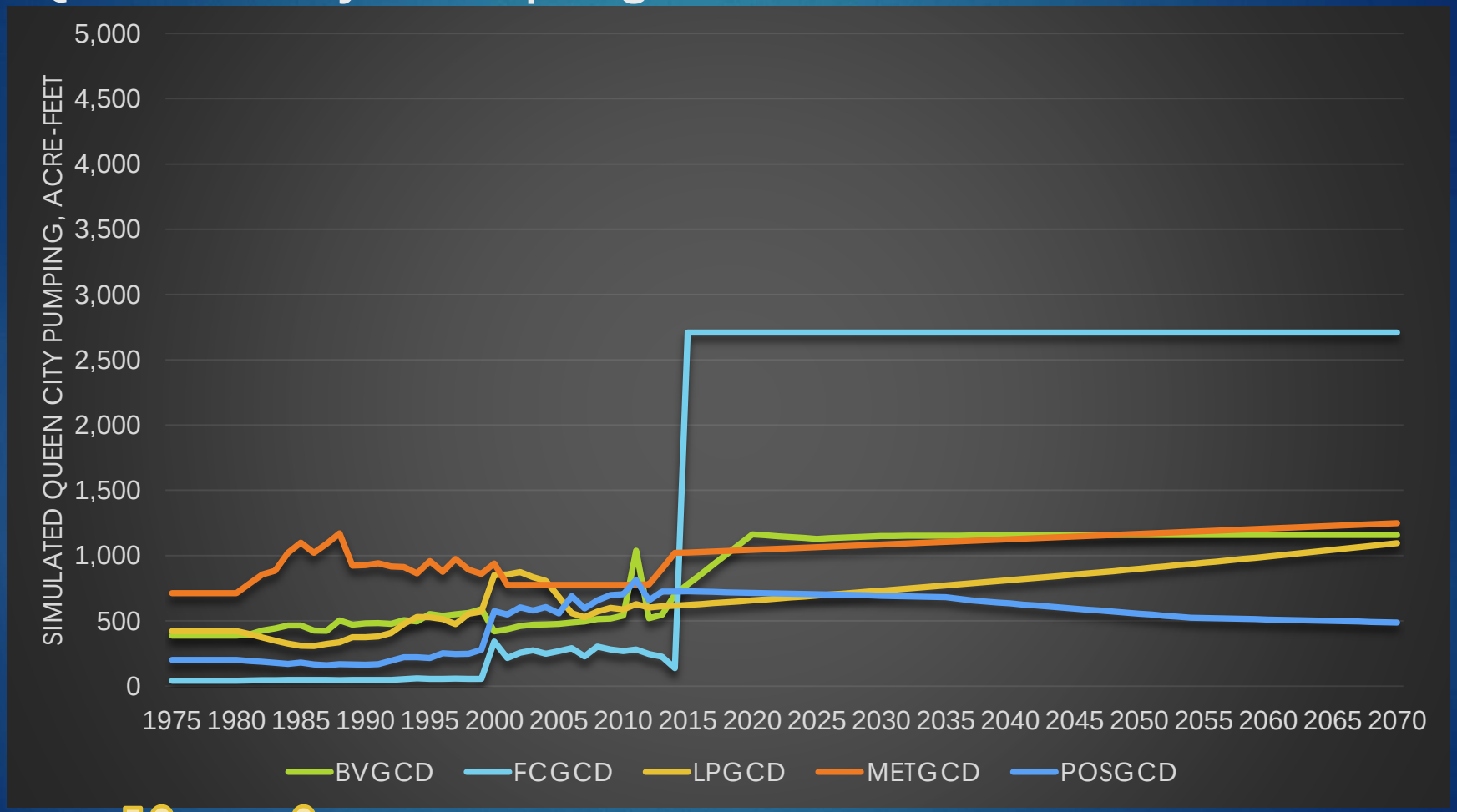
Sparta Pumping



Preliminary

Predictive Scenario 4

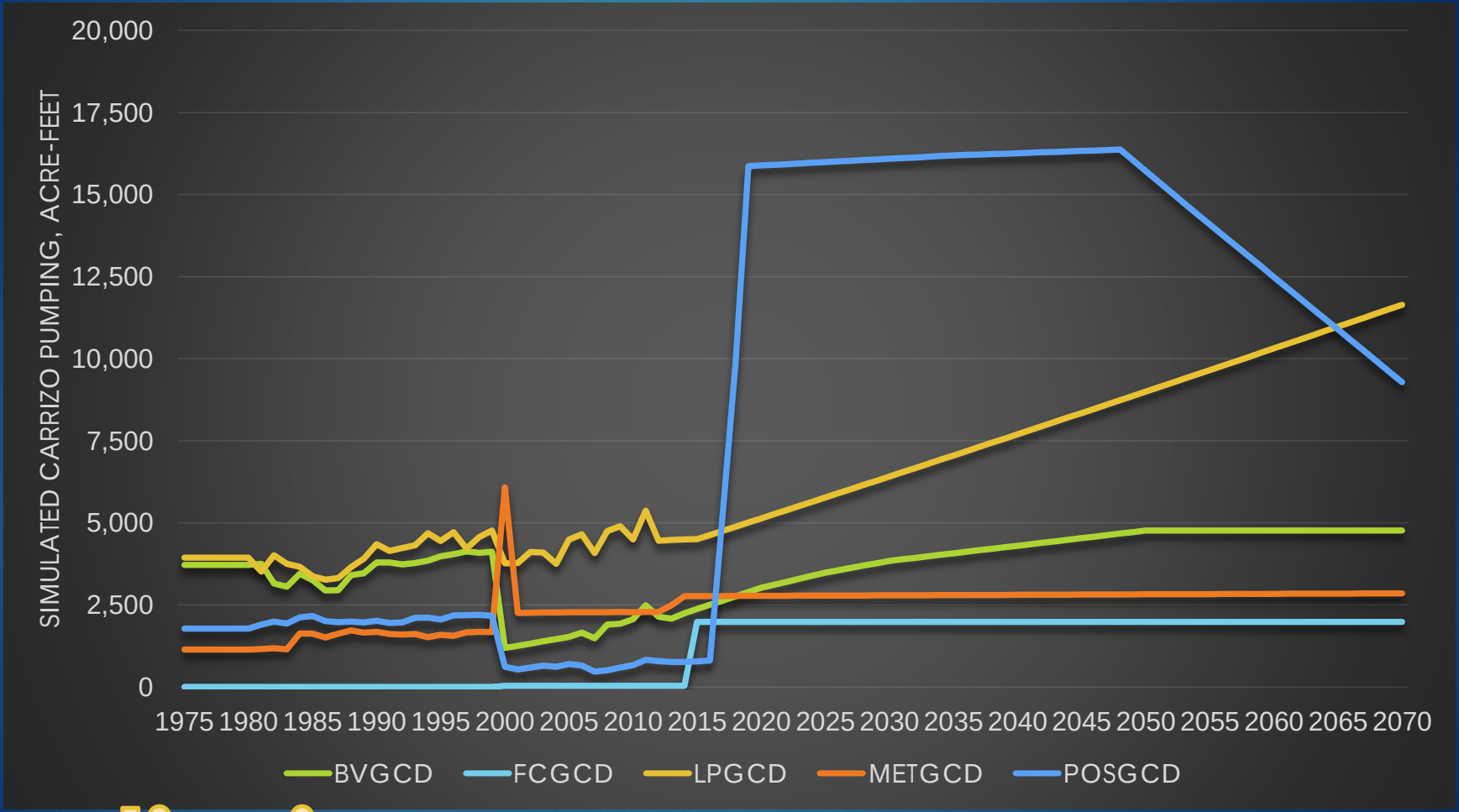
Queen City Pumping



Preliminary

Predictive Scenario 4

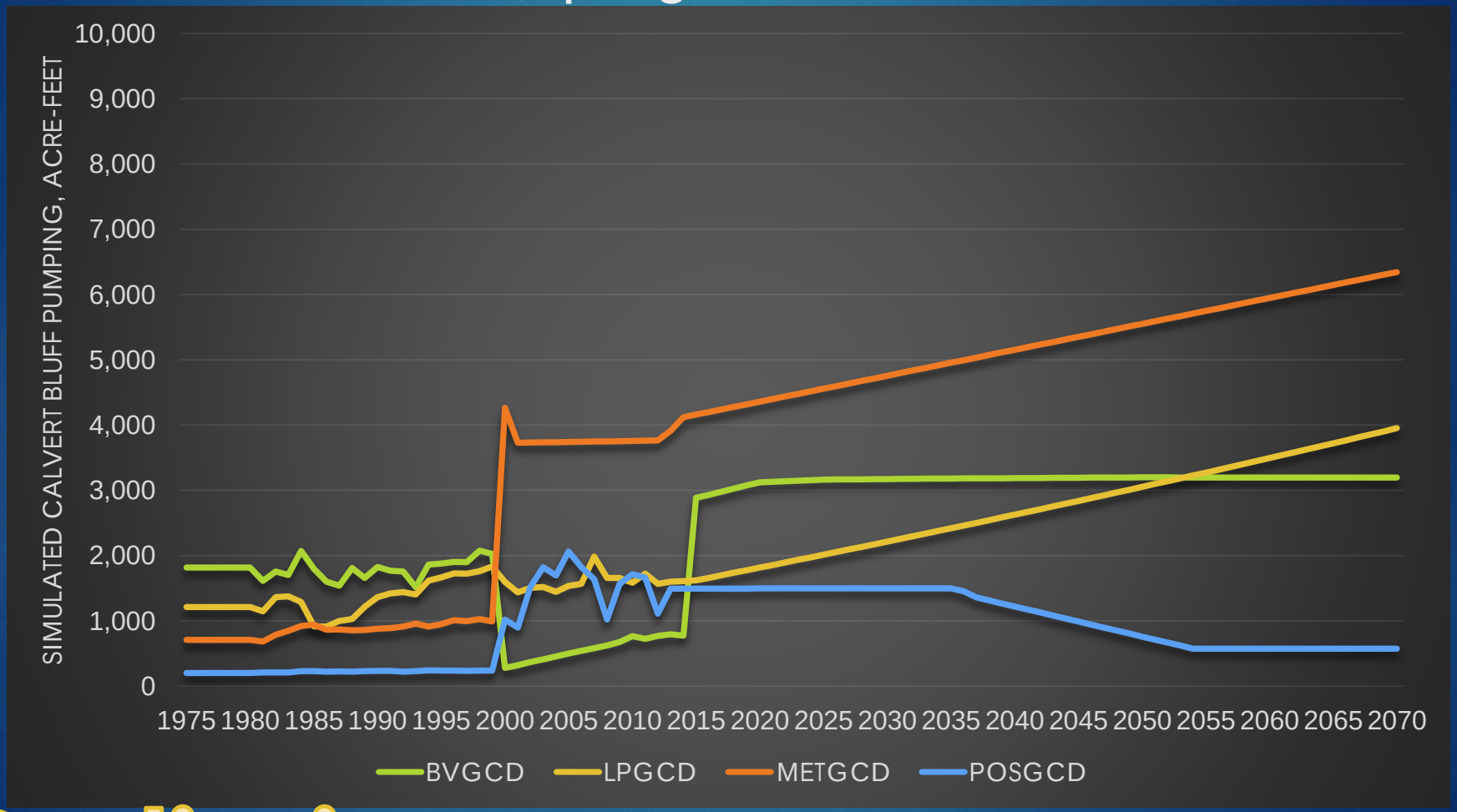
Carrizo Pumping



Preliminary

Predictive Scenario 4

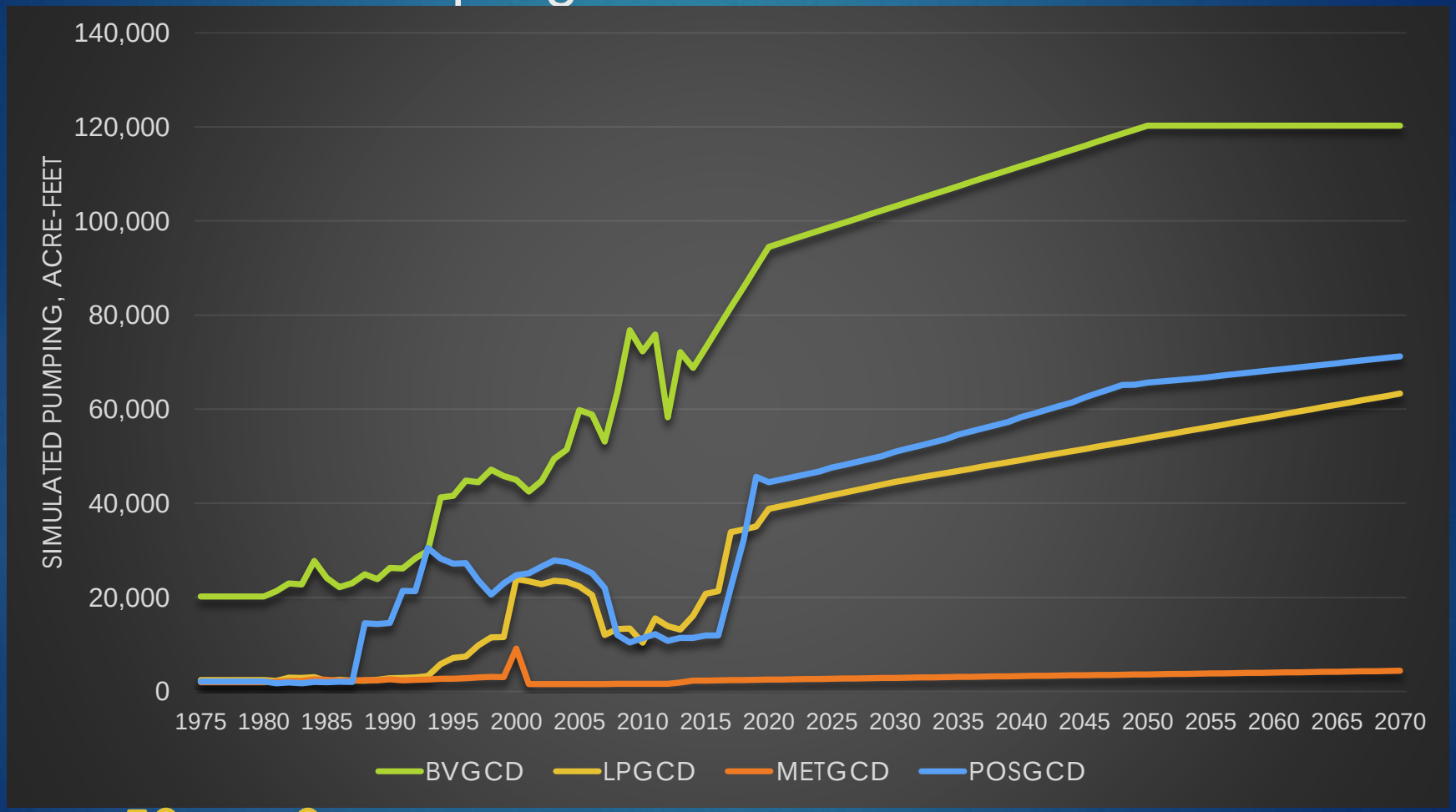
Calvert Bluff Pumping



Preliminary

Predictive Scenario 4

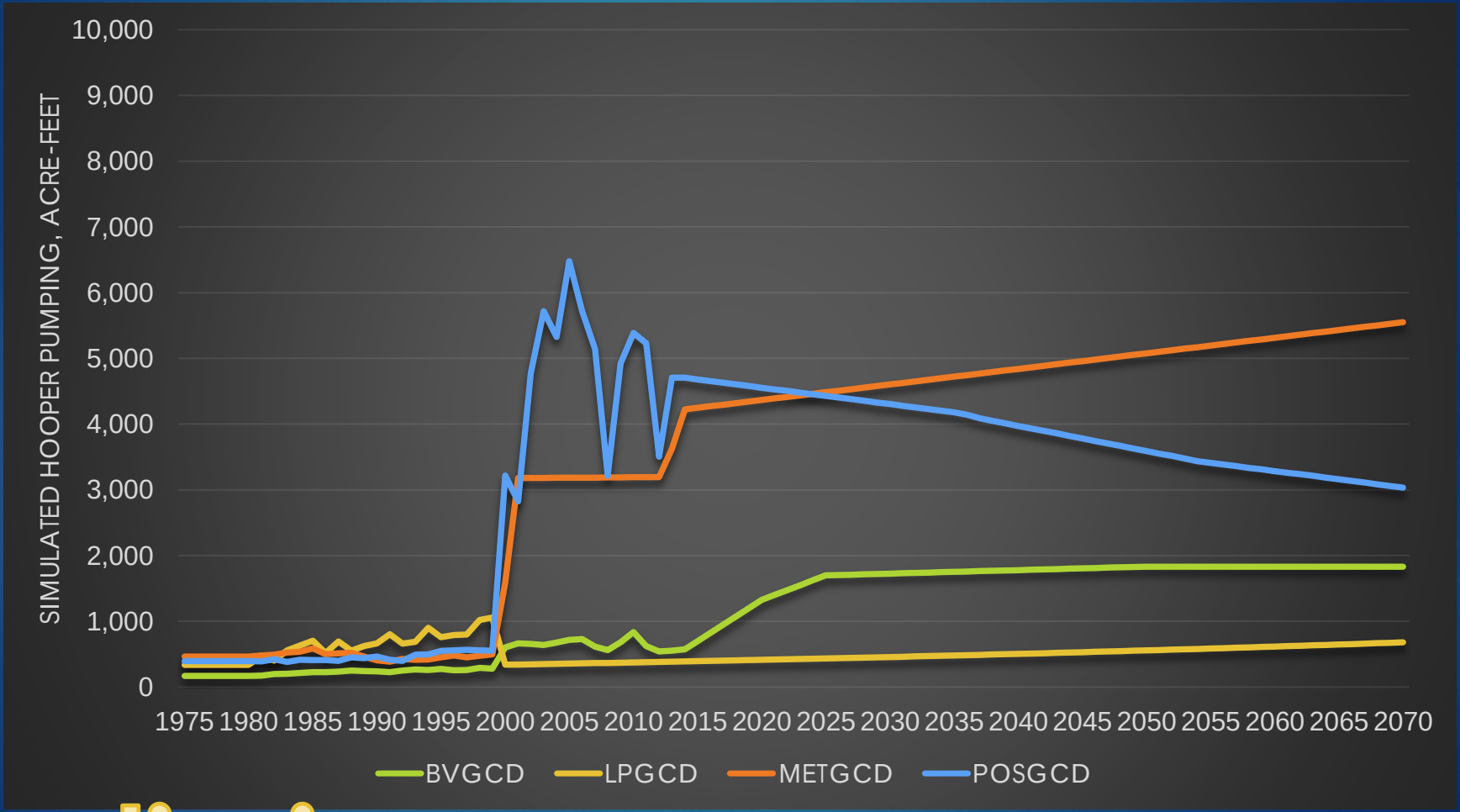
Simsboro Pumping



Preliminary

Predictive Scenario 4

Hooper Pumping



Preliminary

Predictive Scenario 4 Pumping

Year 2070 in Acre-Feet

District	Carrizo	Calvert Bluff	Simsboro	Hooper	Queen City	Sparta	Total
Brazos Valley	4,765	3,197	120,262	1,832	1,158	9,259	140,475
Fayette County	1,985	-	-	-	2,709	2,802	7,496
Lost Pines	11,510	3,906	62,828	673	1,084	565	80,565
Mid-East Texas	2,851	6,305	4,342	5,527	1,245	5,093	25,363
Post Oak Savannah	9,604	575	70,926	3,059	490	1,577	86,231
GMA 12	30,715	13,983	258,358	11,091	6,686	19,297	340,130

Preliminary

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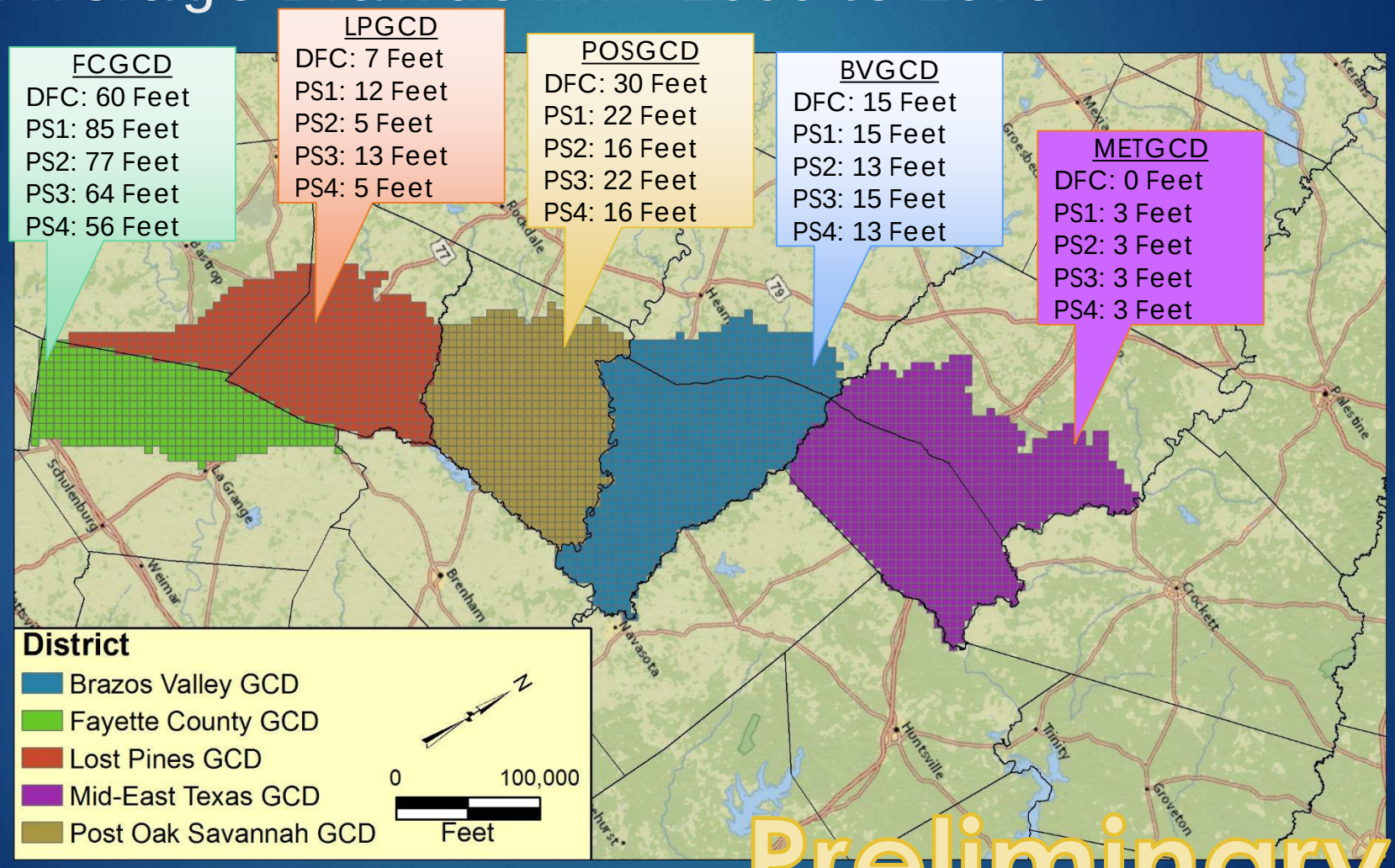
Sparta Aquifer (Layer 1)

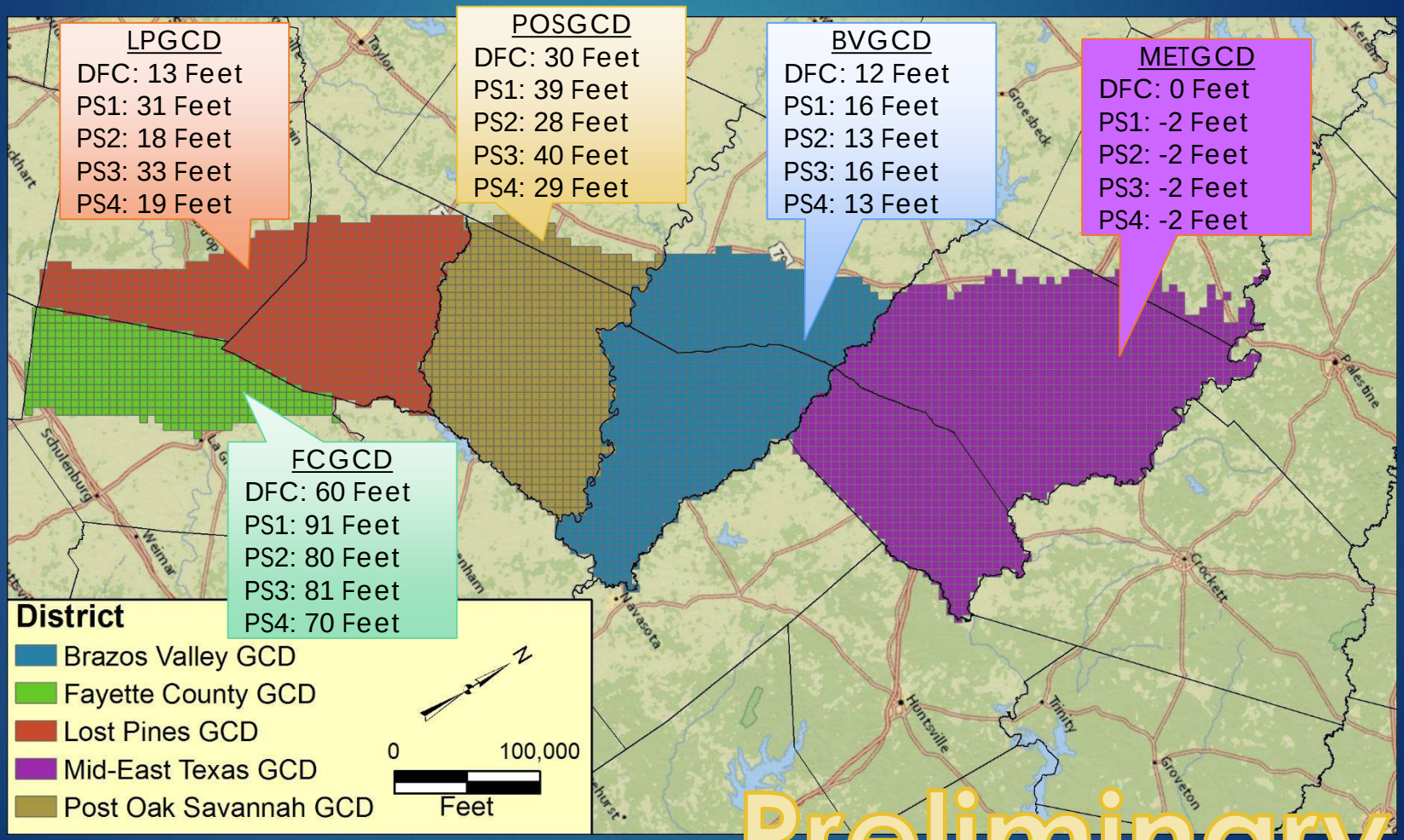
Average Drawdown – 2000 to 2070



Preliminary

Queen City Aquifer (Layer 3)

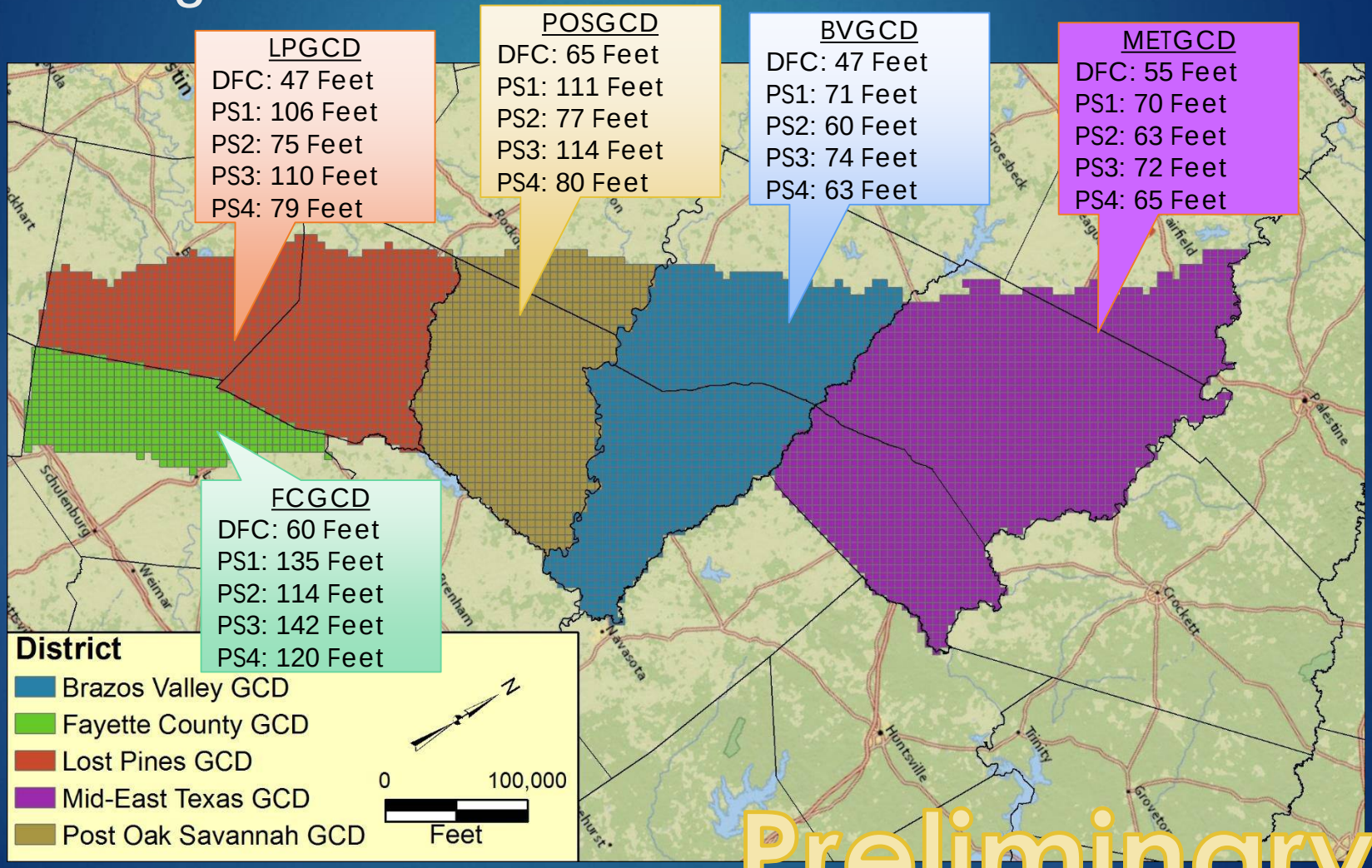
Average Drawdown – 2000 to 2070



Preliminary

Carrizo Aquifer (Layer 5)

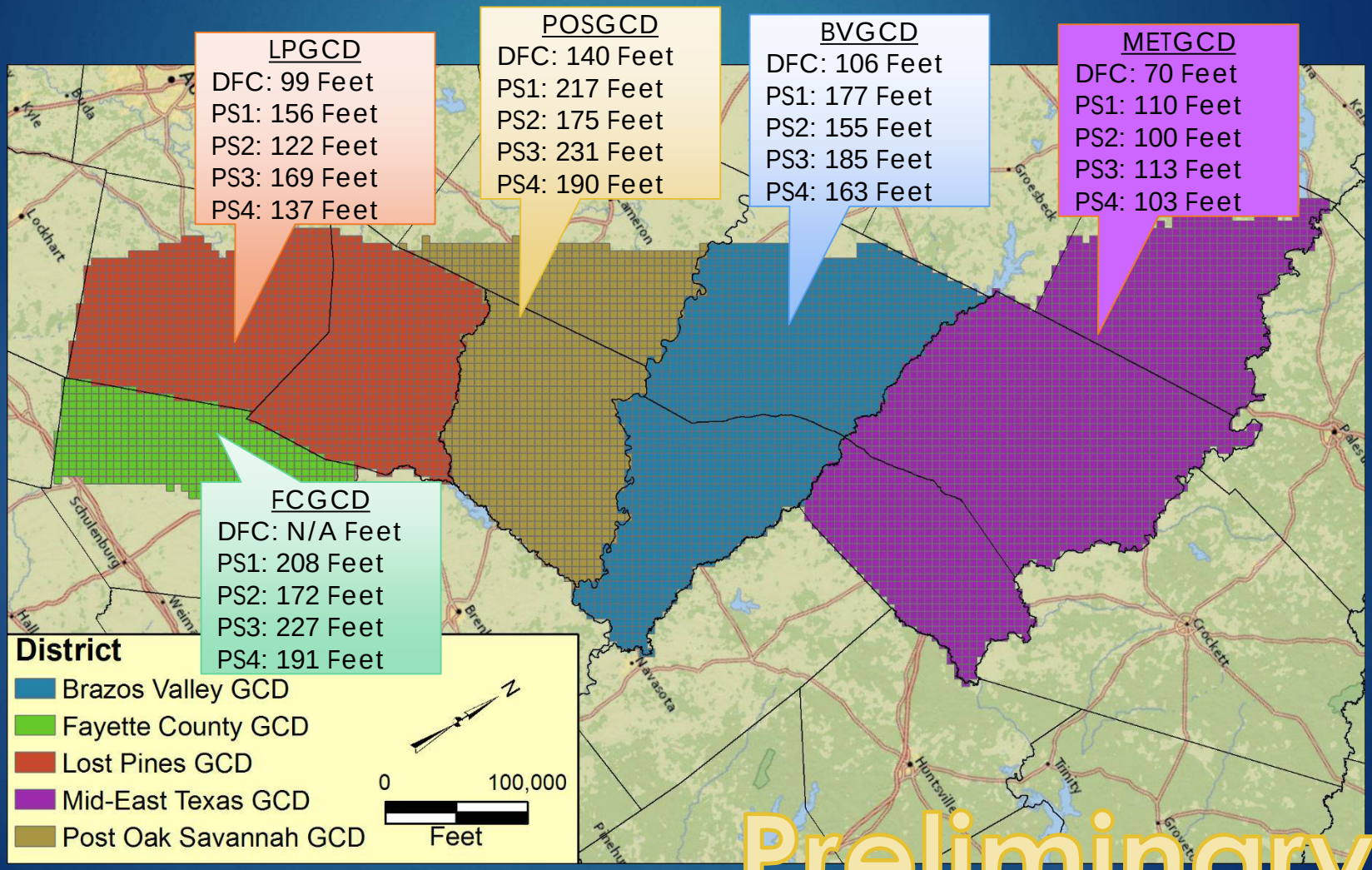
Average Drawdown – 2000 to 2070



Preliminary

Calvert Bluff Aquifer (Layer 6)

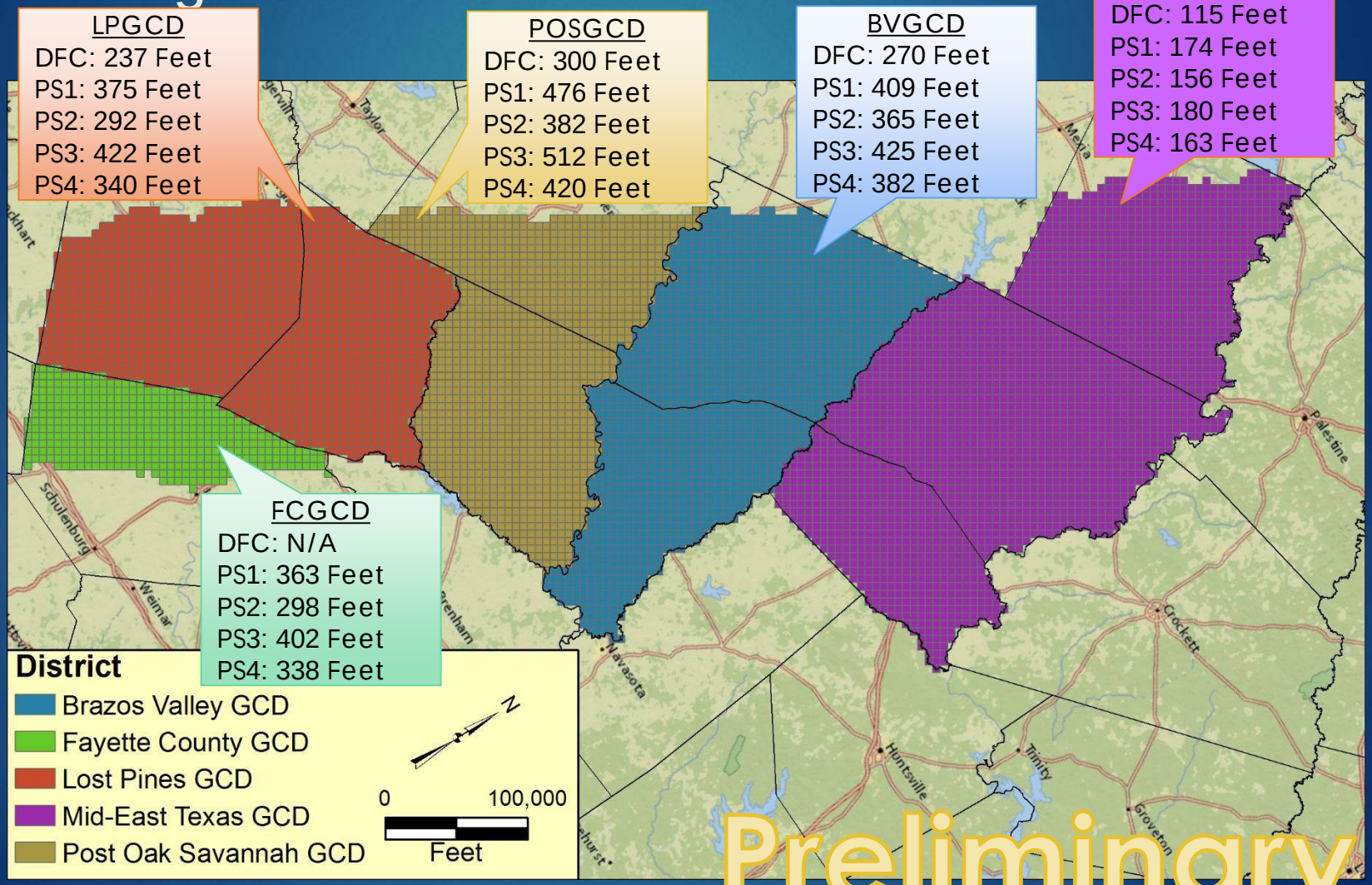
Average Drawdown – 2000 to 2070



Preliminary

Simsboro Aquifer (Layer 7)

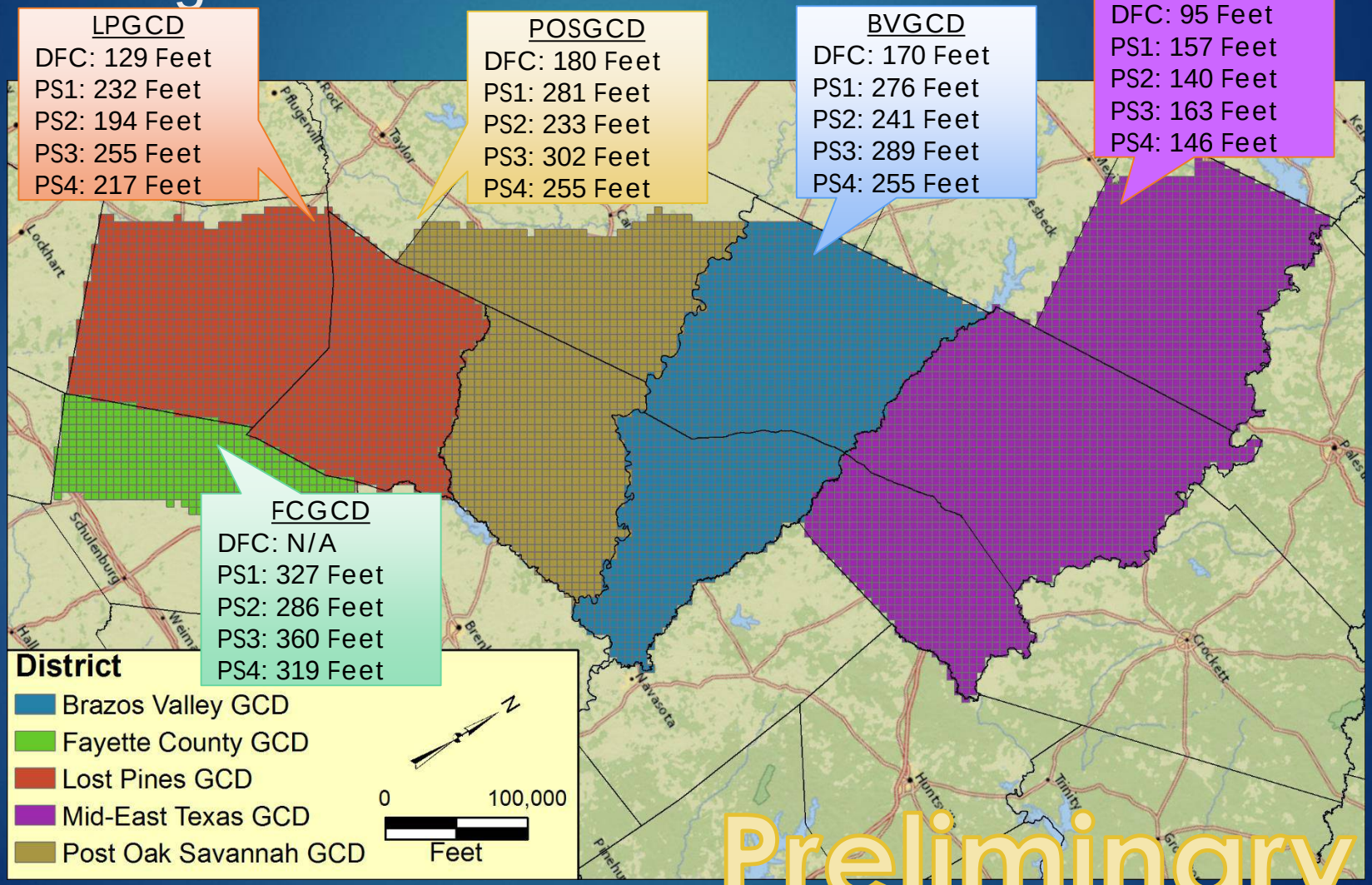
Average Drawdown – 2000 to 2070



Preliminary

Hooper Aquifer (Layer 8)

Average Drawdown – 2000 to 2070

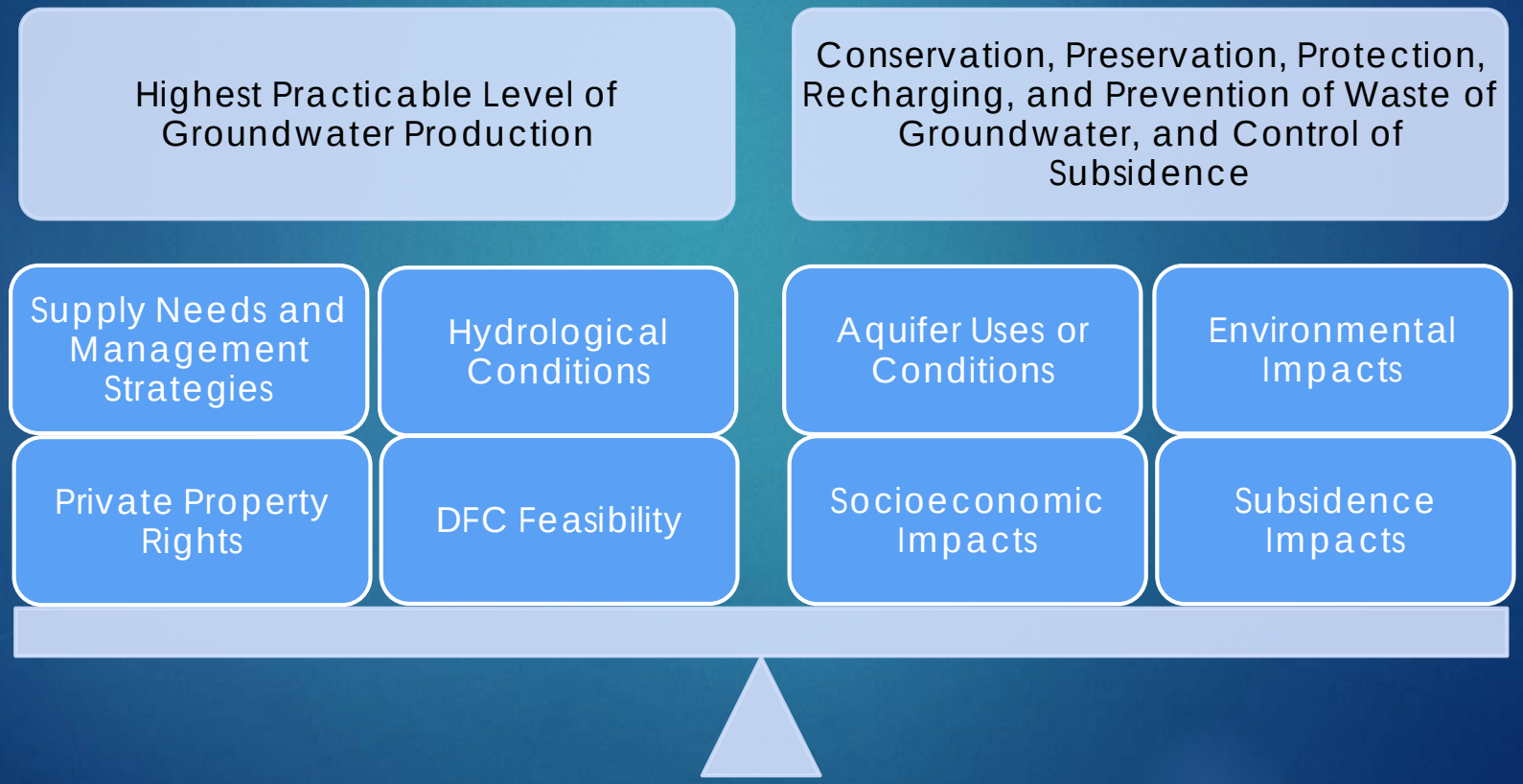


A new standard for desired future conditions

Highest Practicable Level of Groundwater Production

Conservation, Preservation, Protection, Recharging, and Prevention of Waste of Groundwater, and Control of Subsidence

DFC Considerations

- Aquifer Uses or Conditions
- Supply Needs and Management Strategies
- Hydrological Conditions
- Environmental Impacts
- Subsidence Impacts
- Socioeconomic Impacts
- Private Property Rights
- DFC Feasibility
- Other Relevant Information

Finding a balance