

Presentation to the GMA-12
Stakeholder:
Introduction to the Yegua-
Jackson Draft Groundwater
Availability Model

February 11, 2010

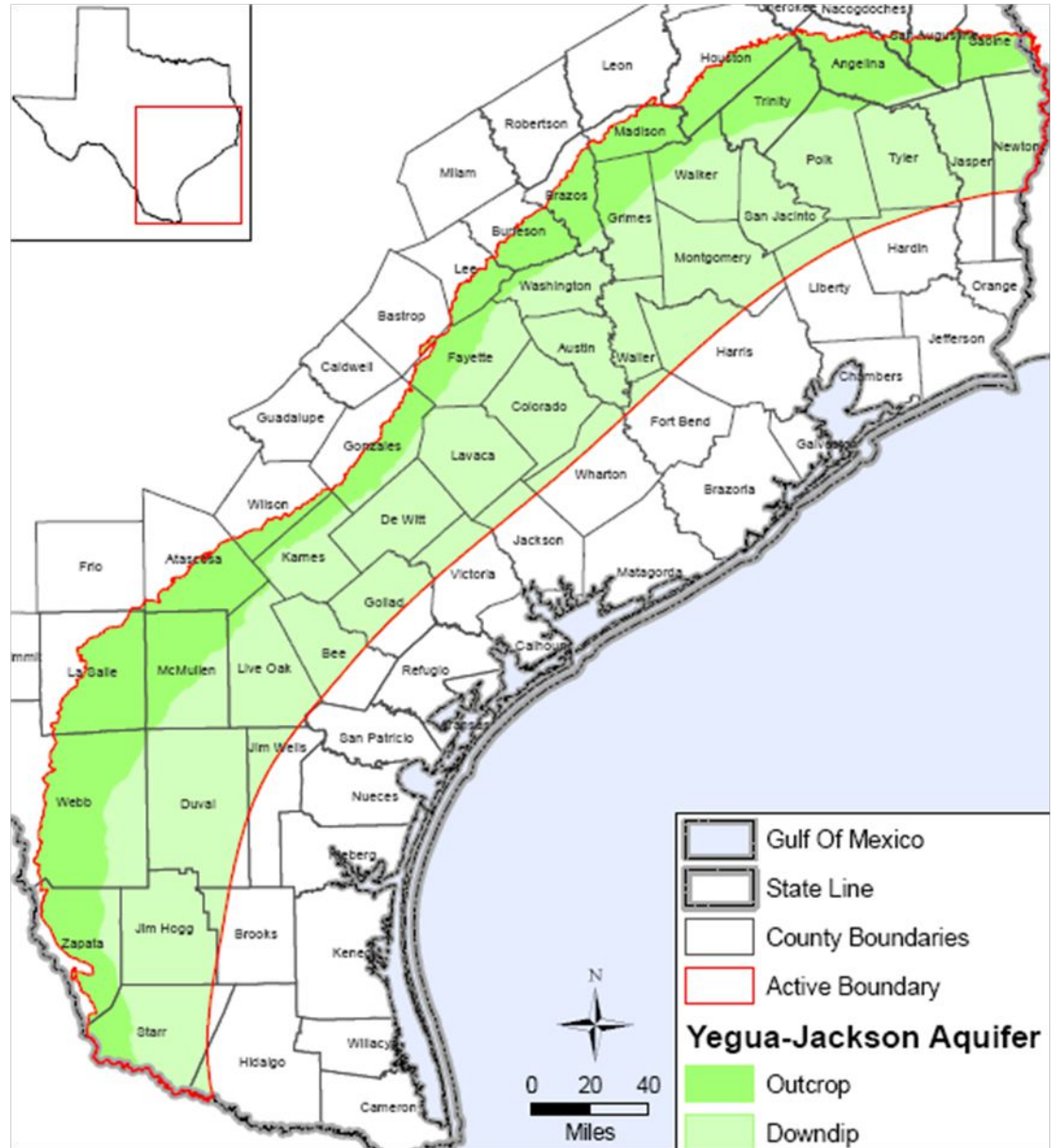
By: Steve Young
URS, Austin

Outline

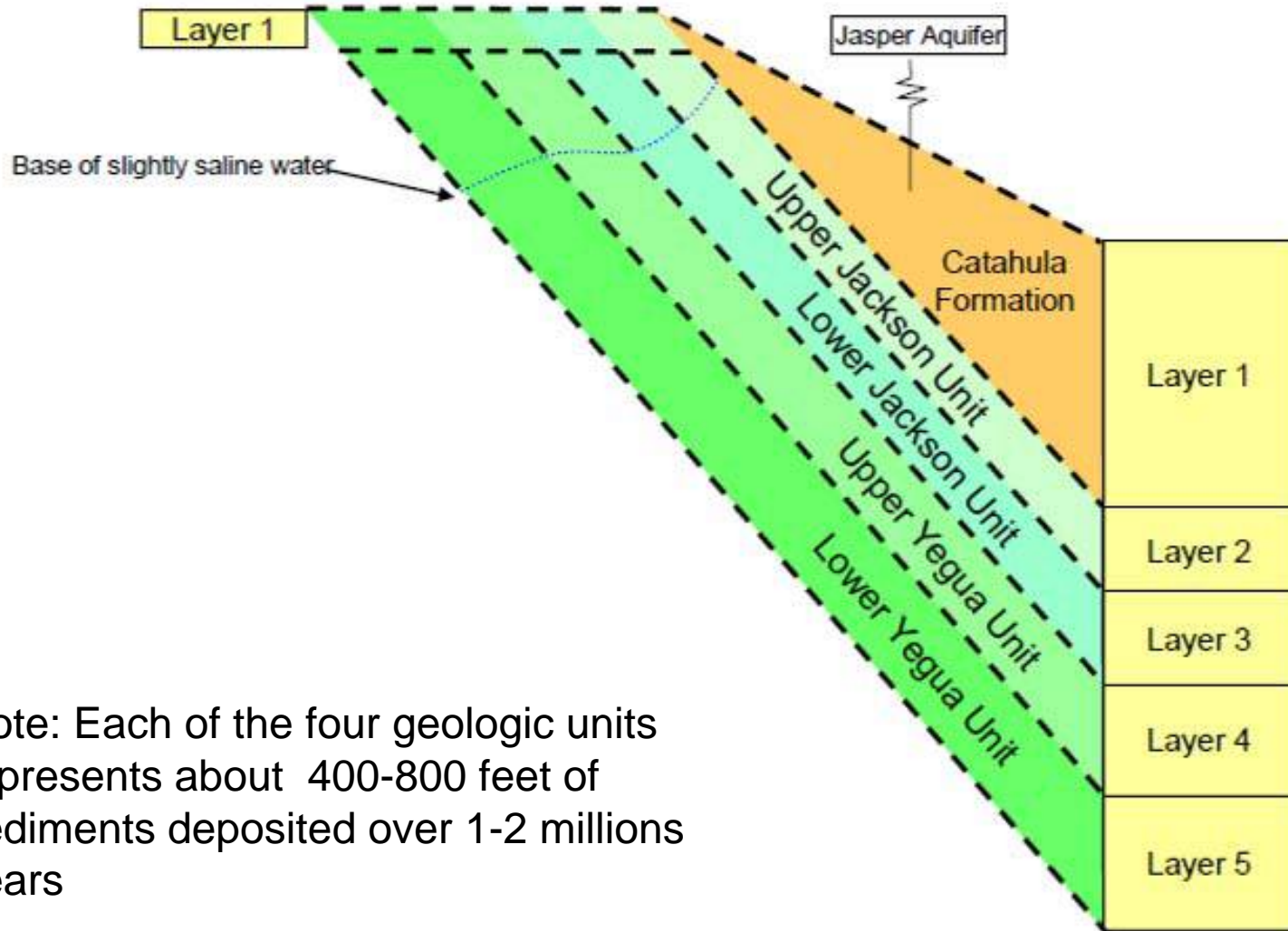
- Model Coverage
- Lithology/Geology
- Historical Pumping
- Historical Water Level Changes/Model Calibration
- Water Balances

Model Coverage

Total pumping is less than 20,000 AFY for any given year of record

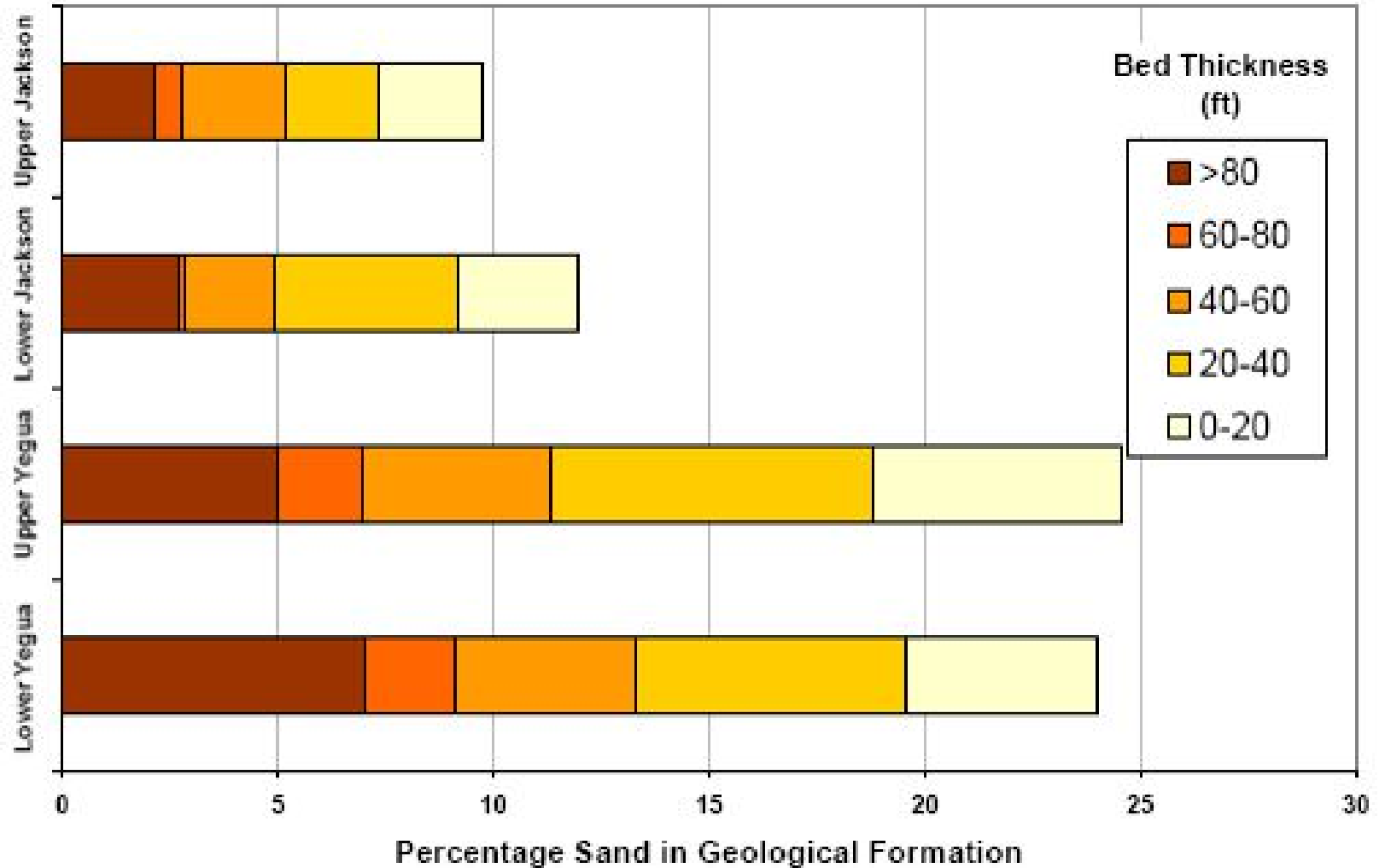


Model Layers

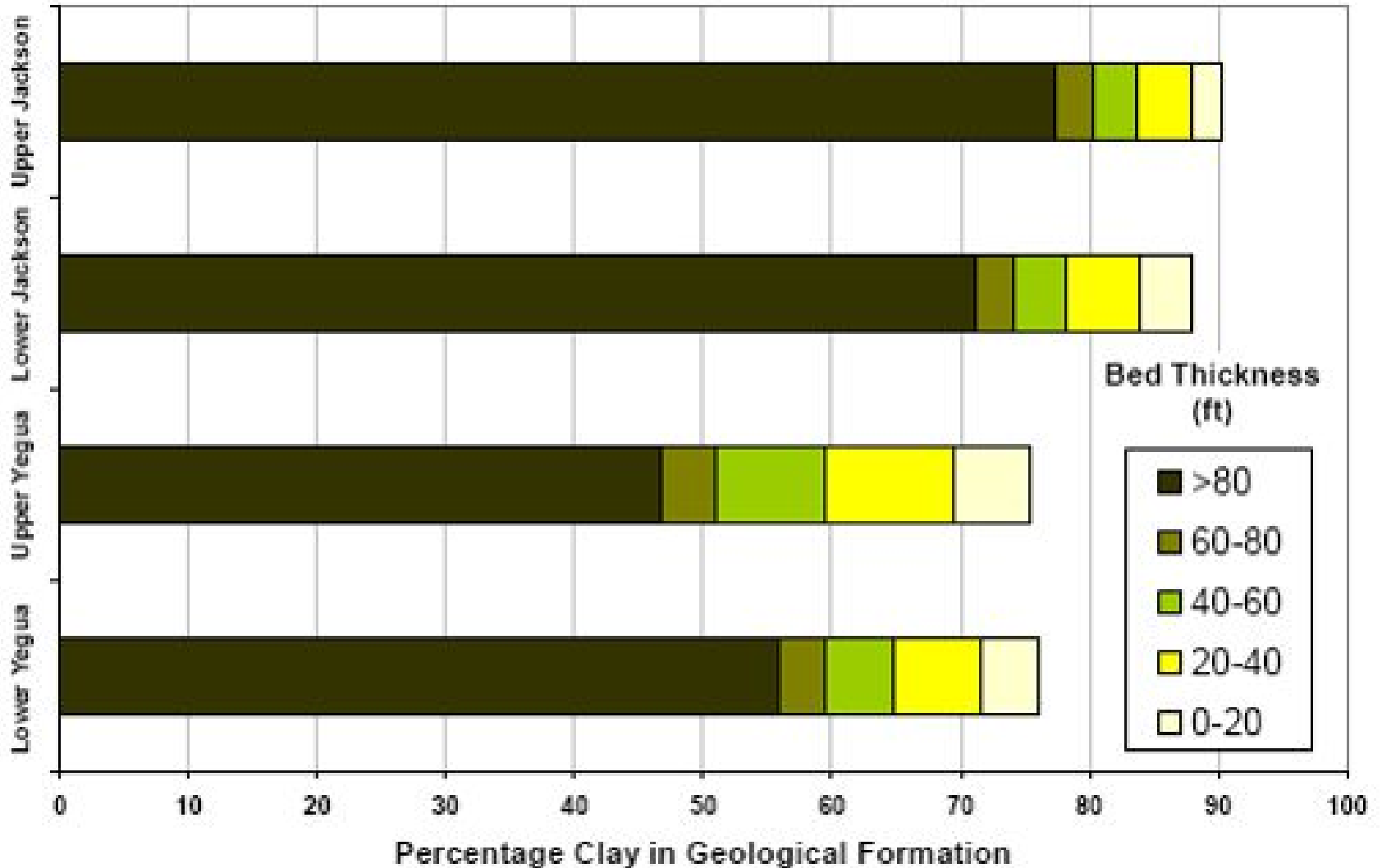


Note: Each of the four geologic units represents about 400-800 feet of sediments deposited over 1-2 millions years

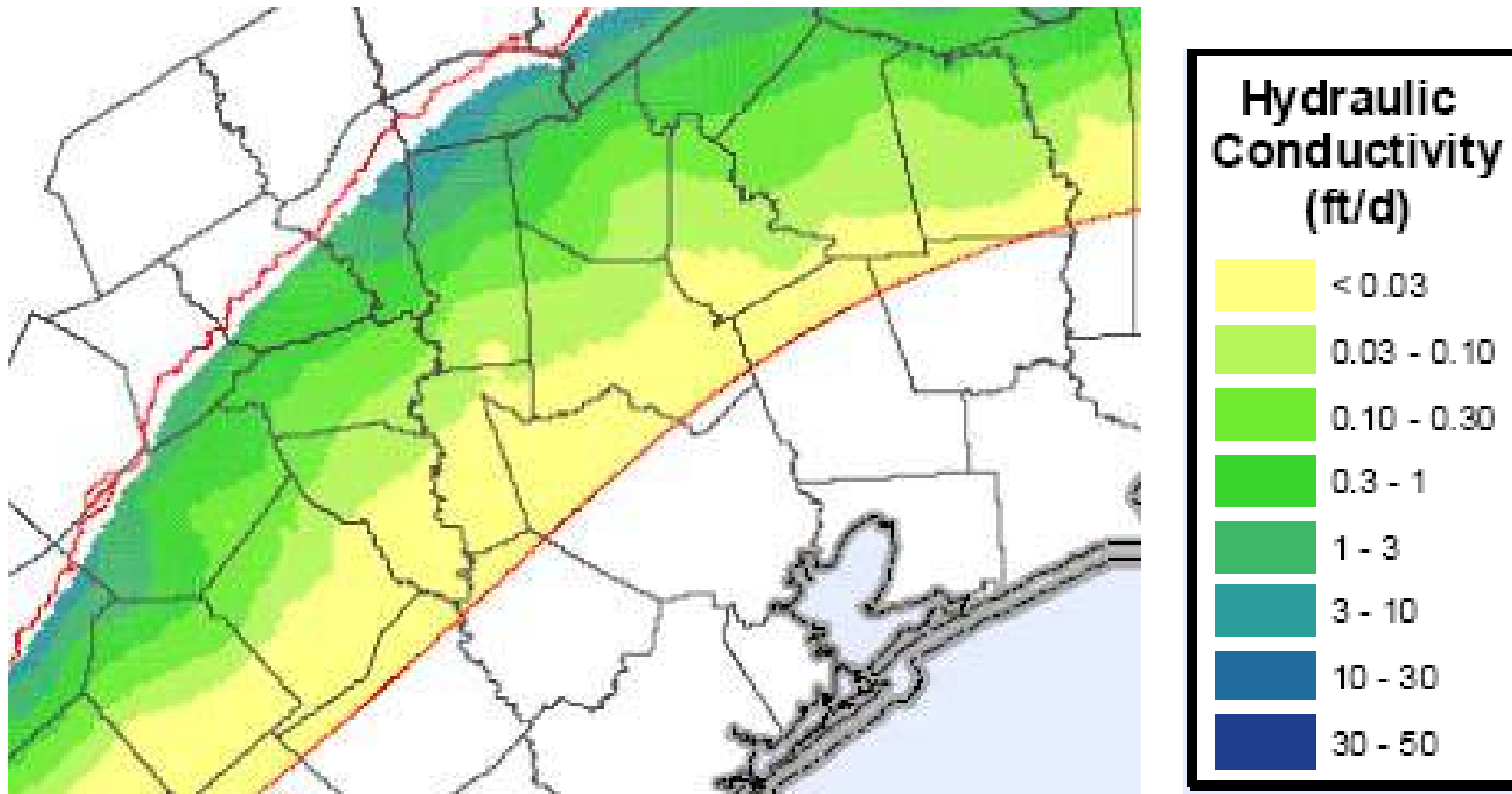
Distribution of Sandy Deposits



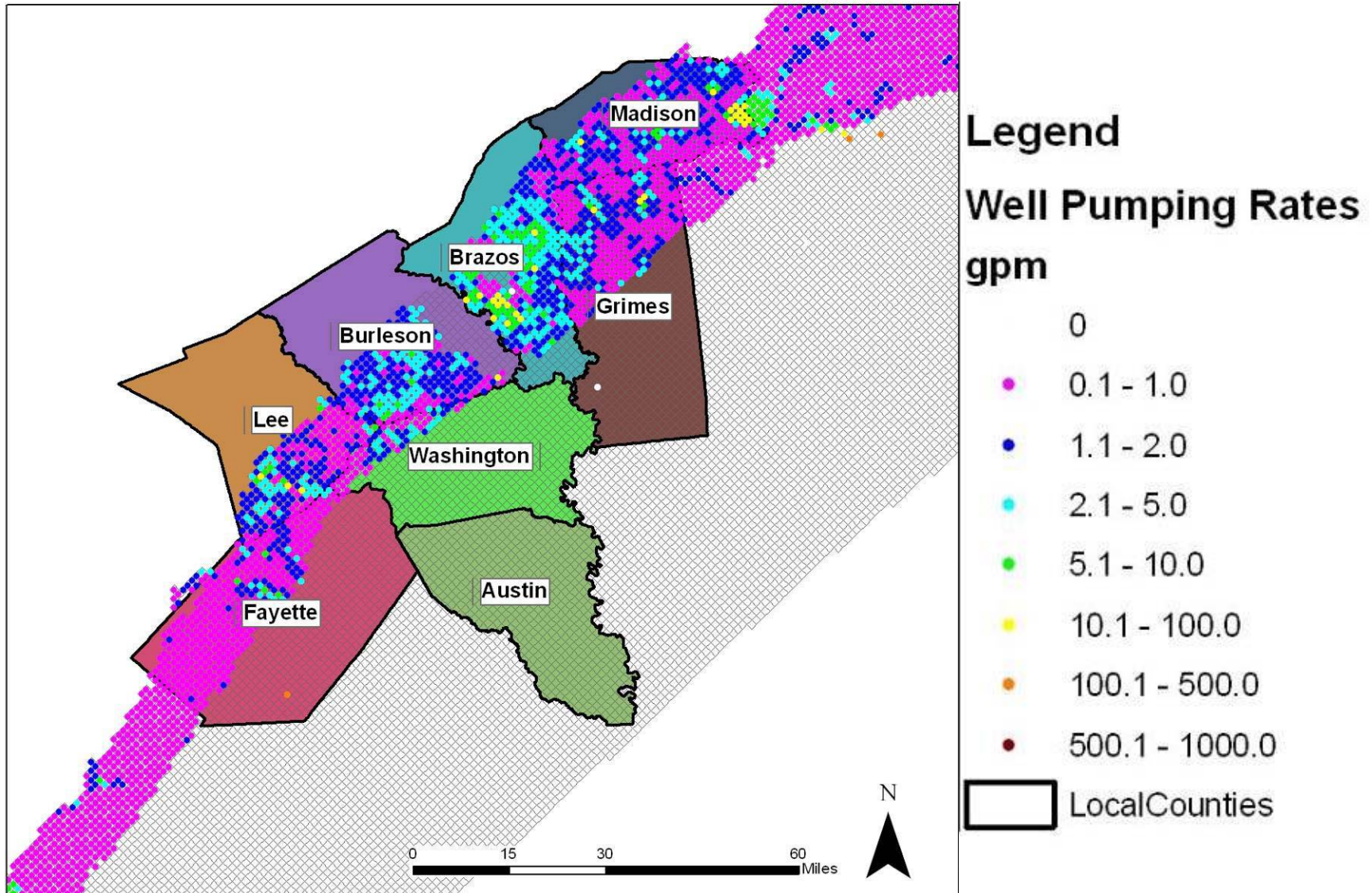
Distribution of Clayey Deposits



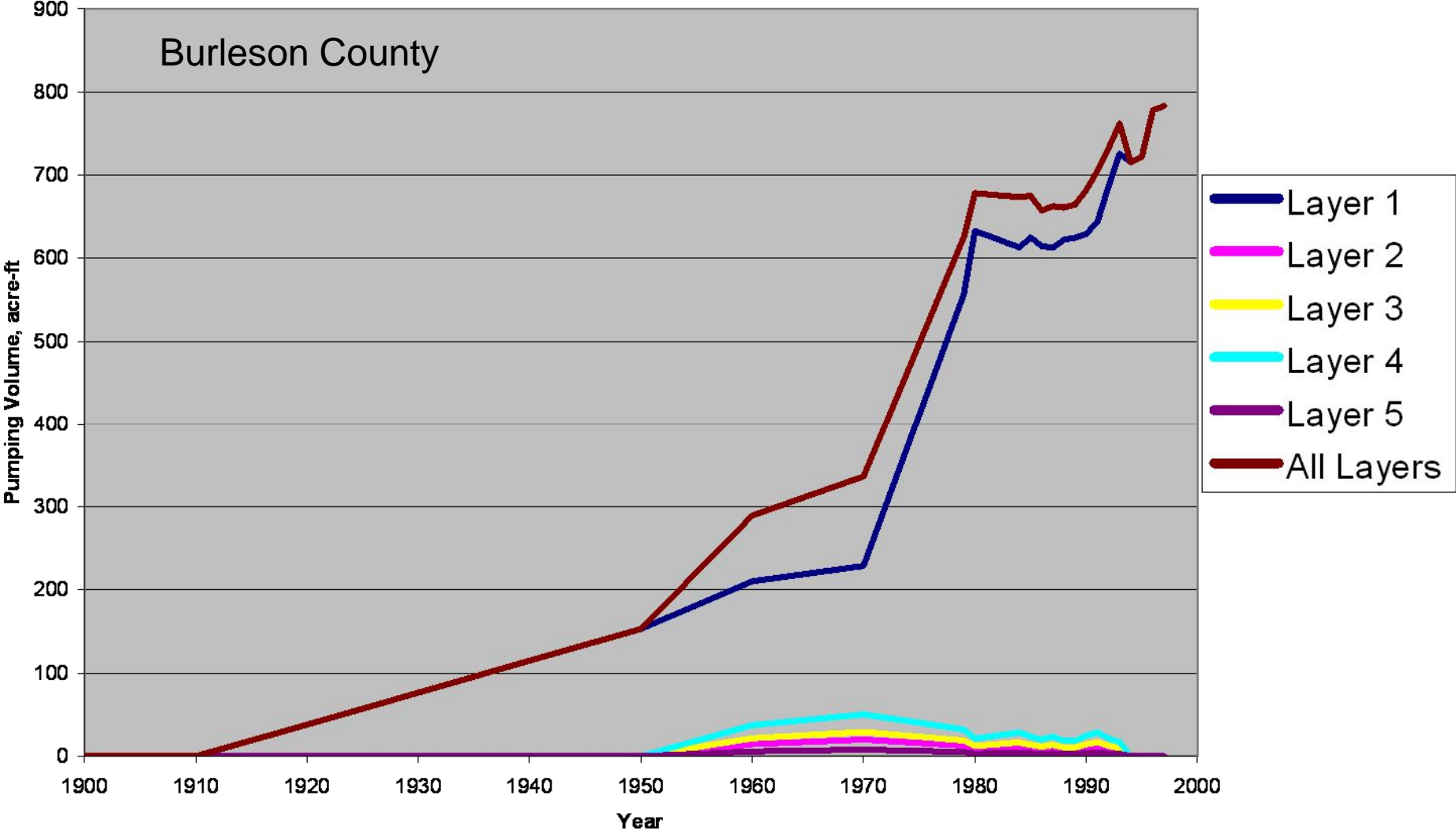
Hydraulic Conductivity Values for the Lower Yegua Aquifer



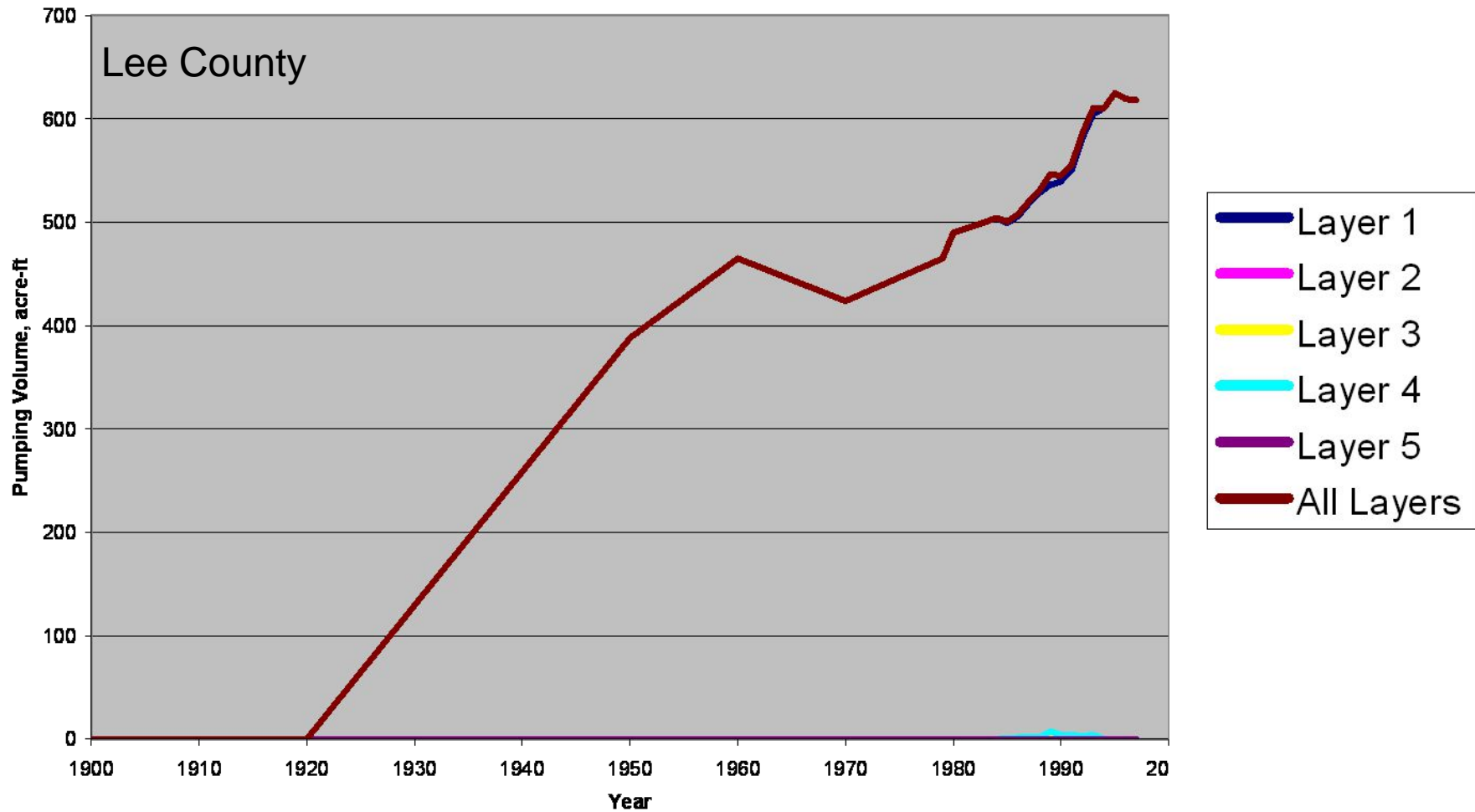
Areal Distribution of Pumping (1997)



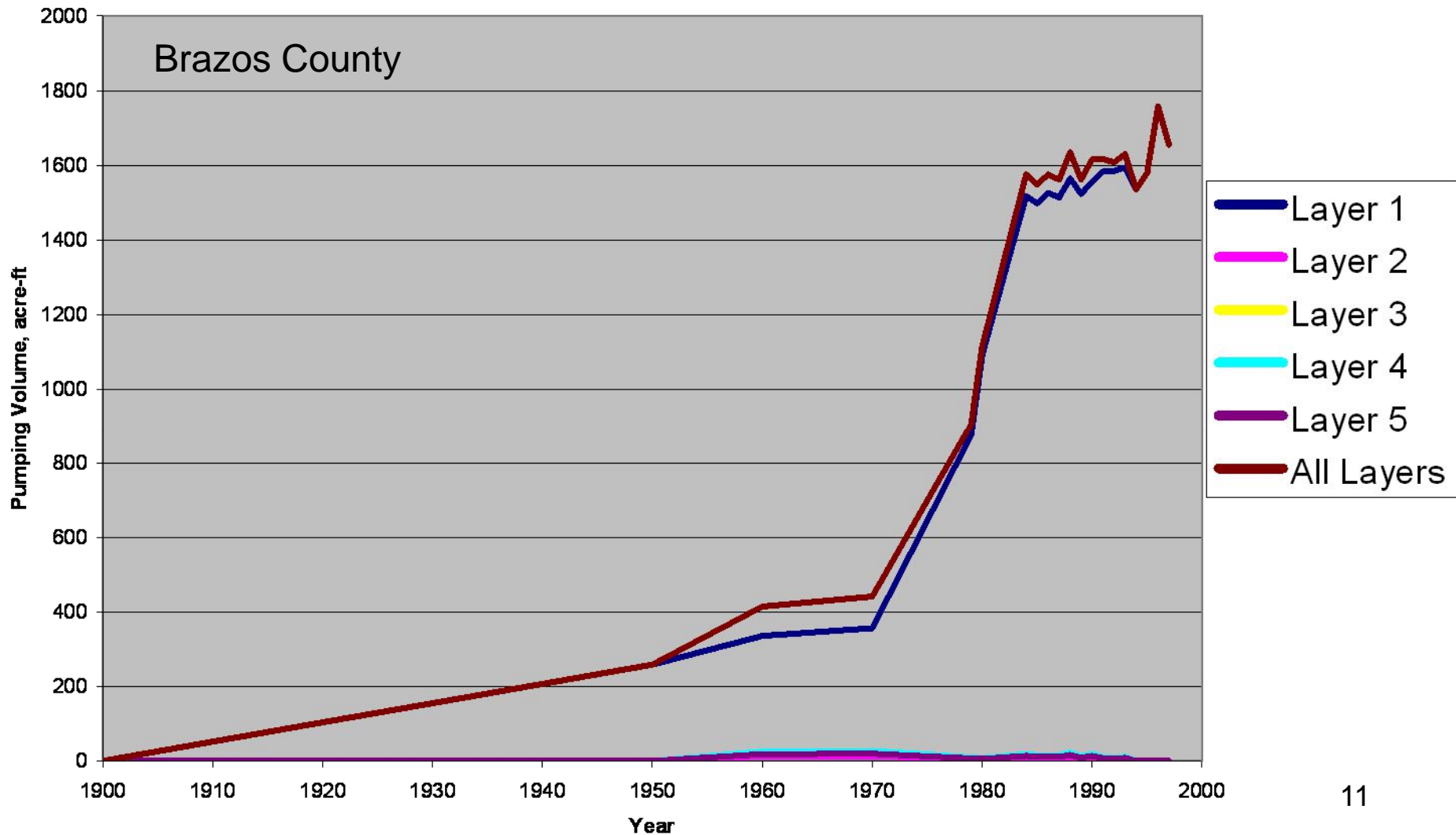
Pumping Over Time: Burleson County



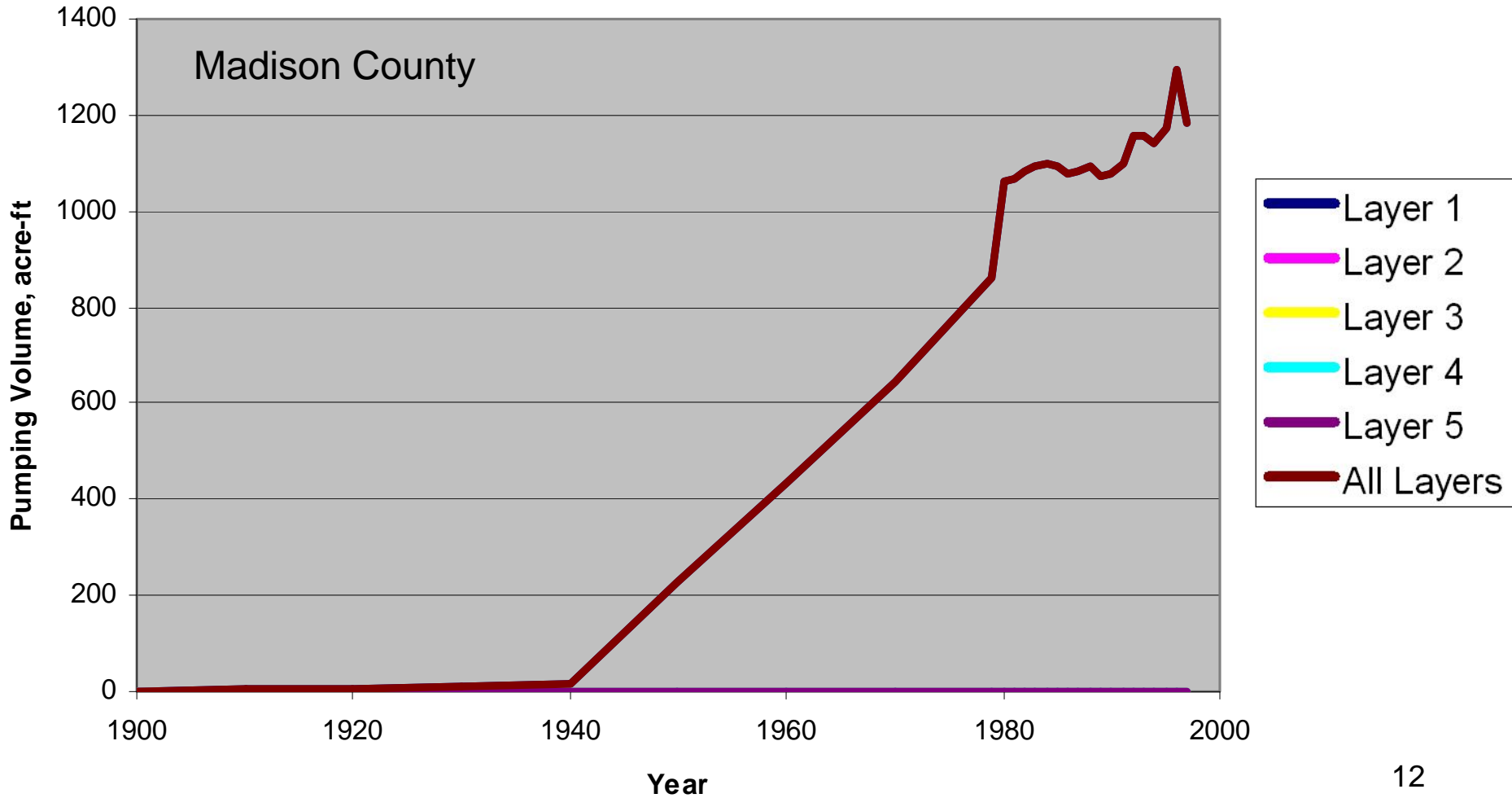
Pumping Over Time: Lee County



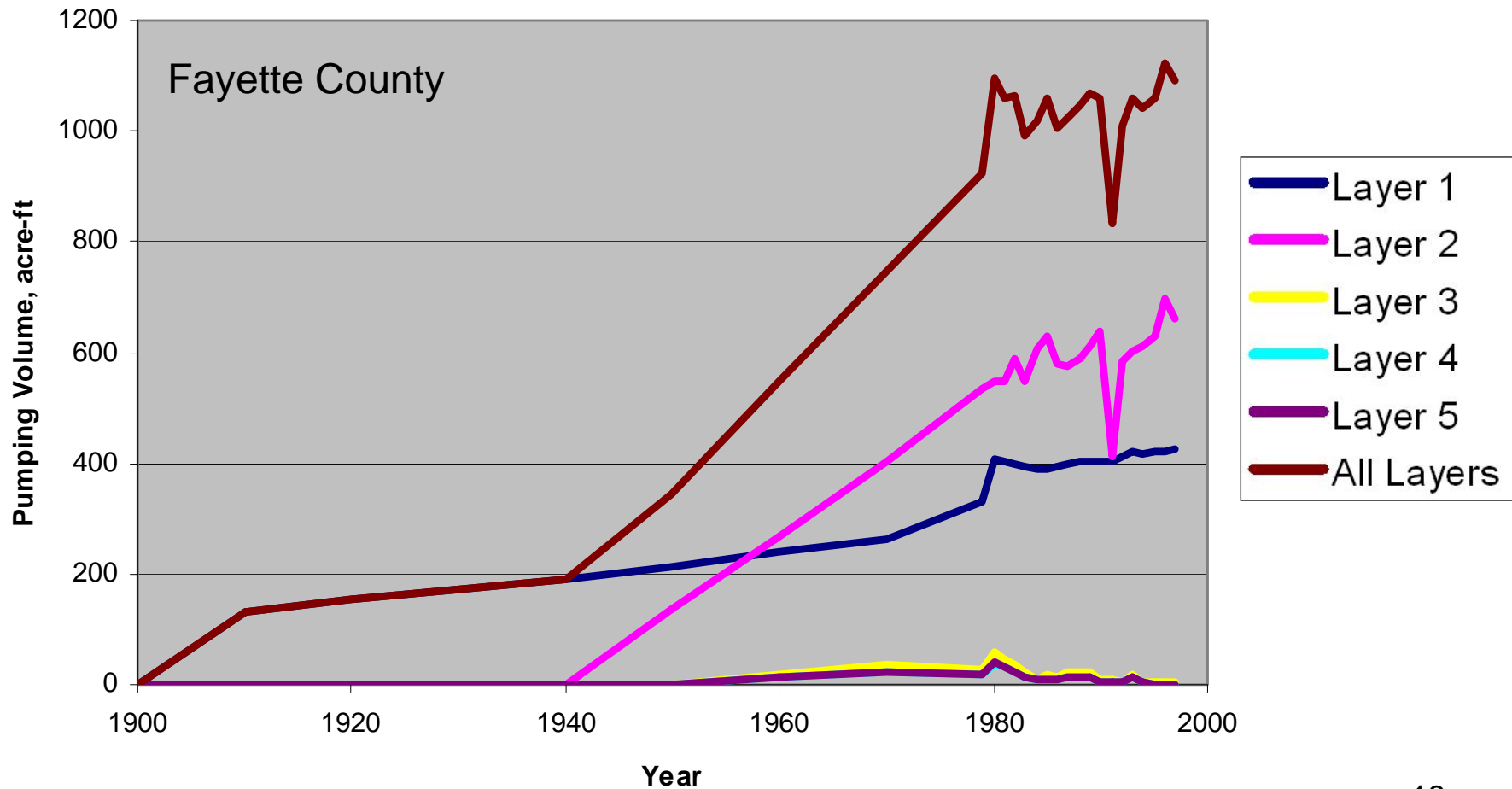
Pumping Over Time: Brazos County



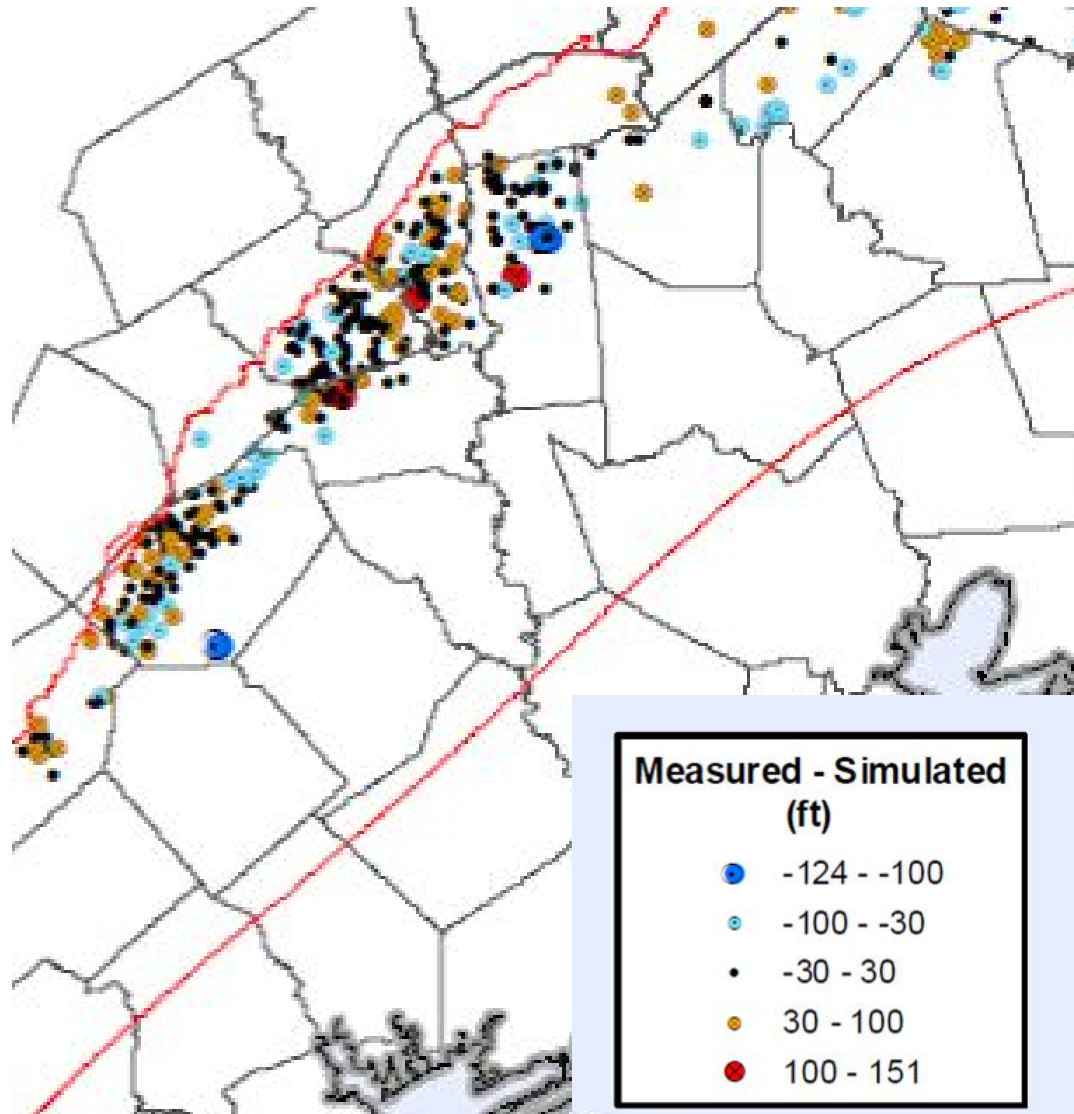
Pumping Over Time: Madison County



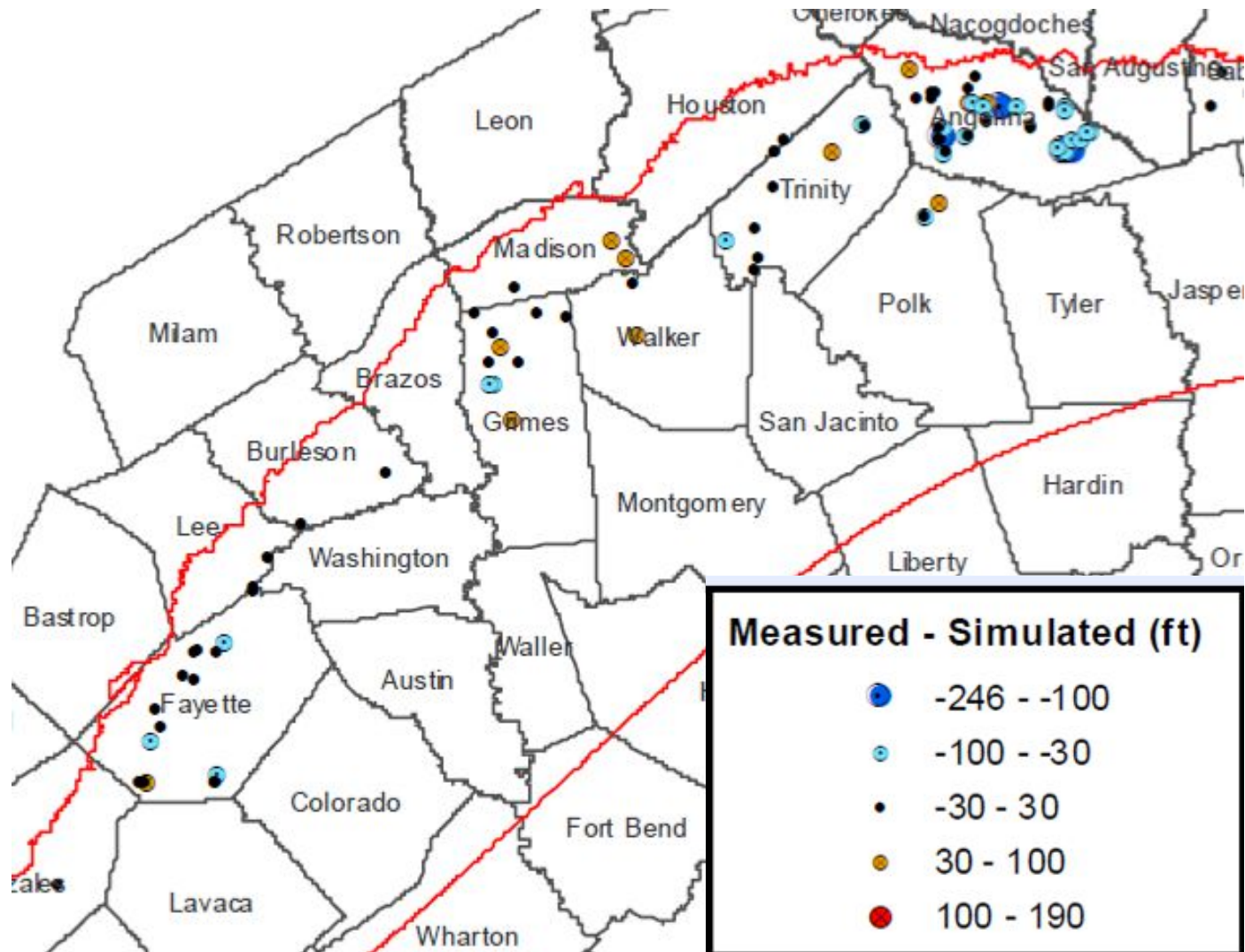
Pumping Over Time: Fayette County



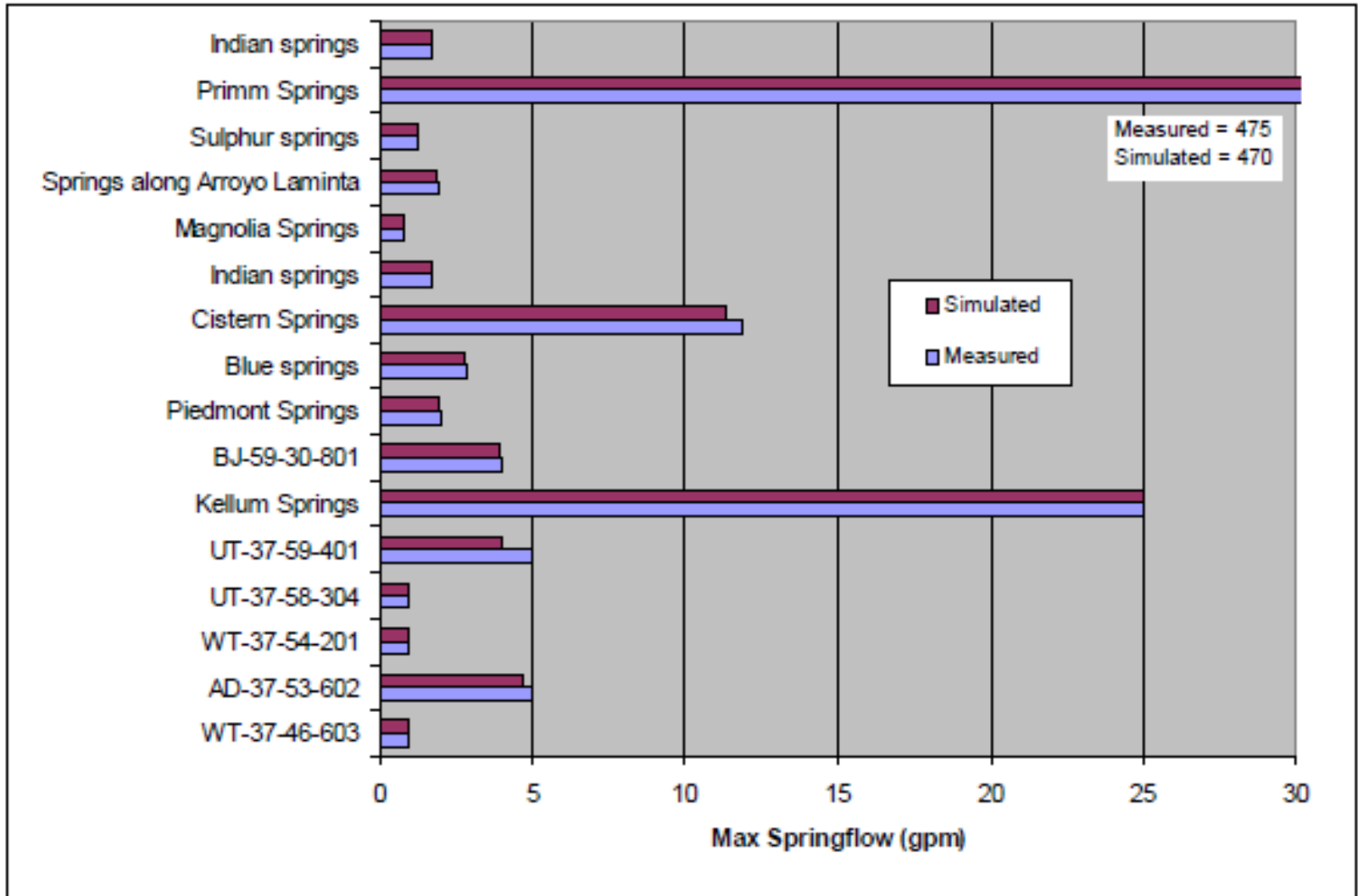
Wells Used for Pre-Pumping Calibration



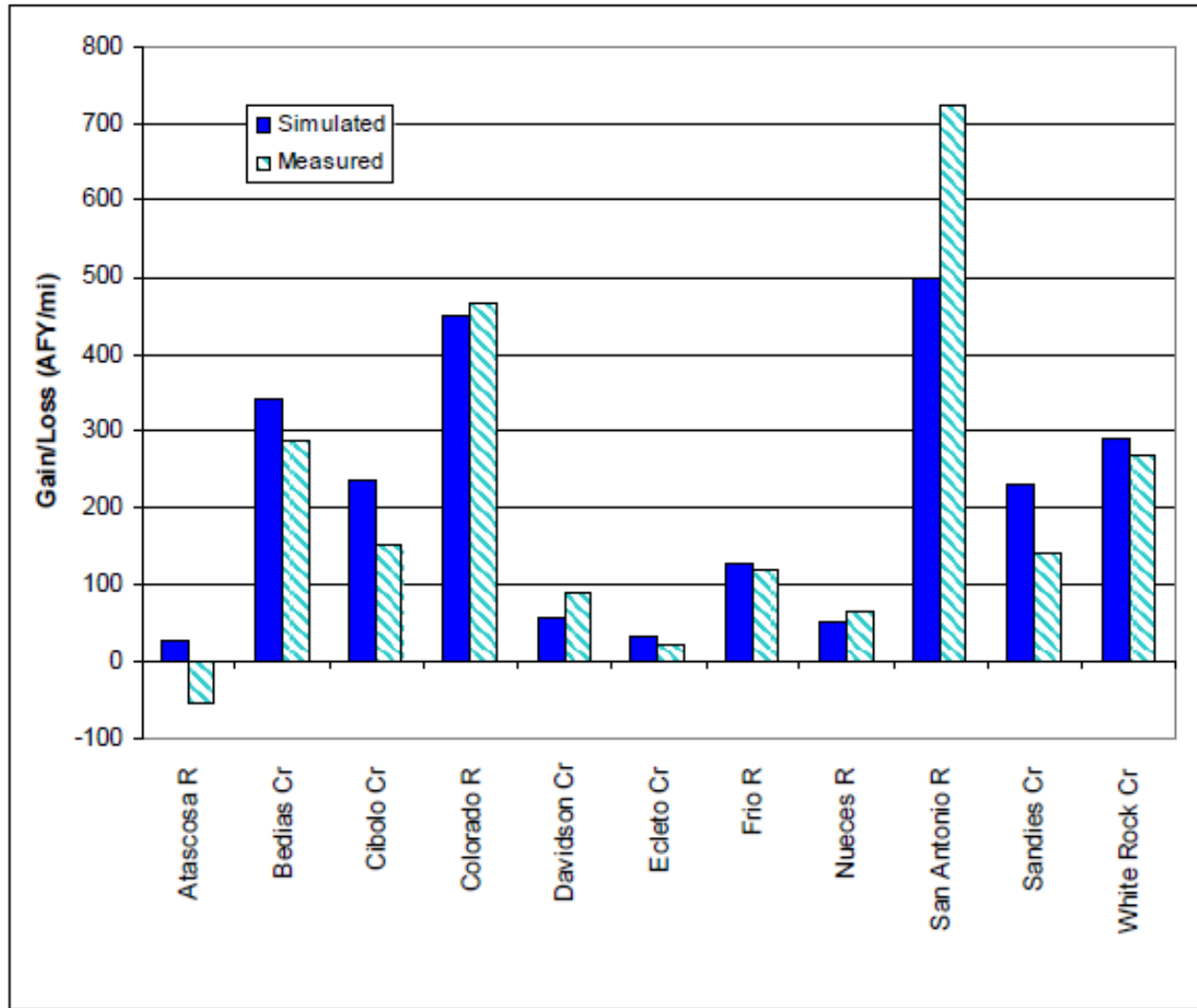
Wells Used for Pumping (1901 - 1997) Calibration



Simulated Spring Flows

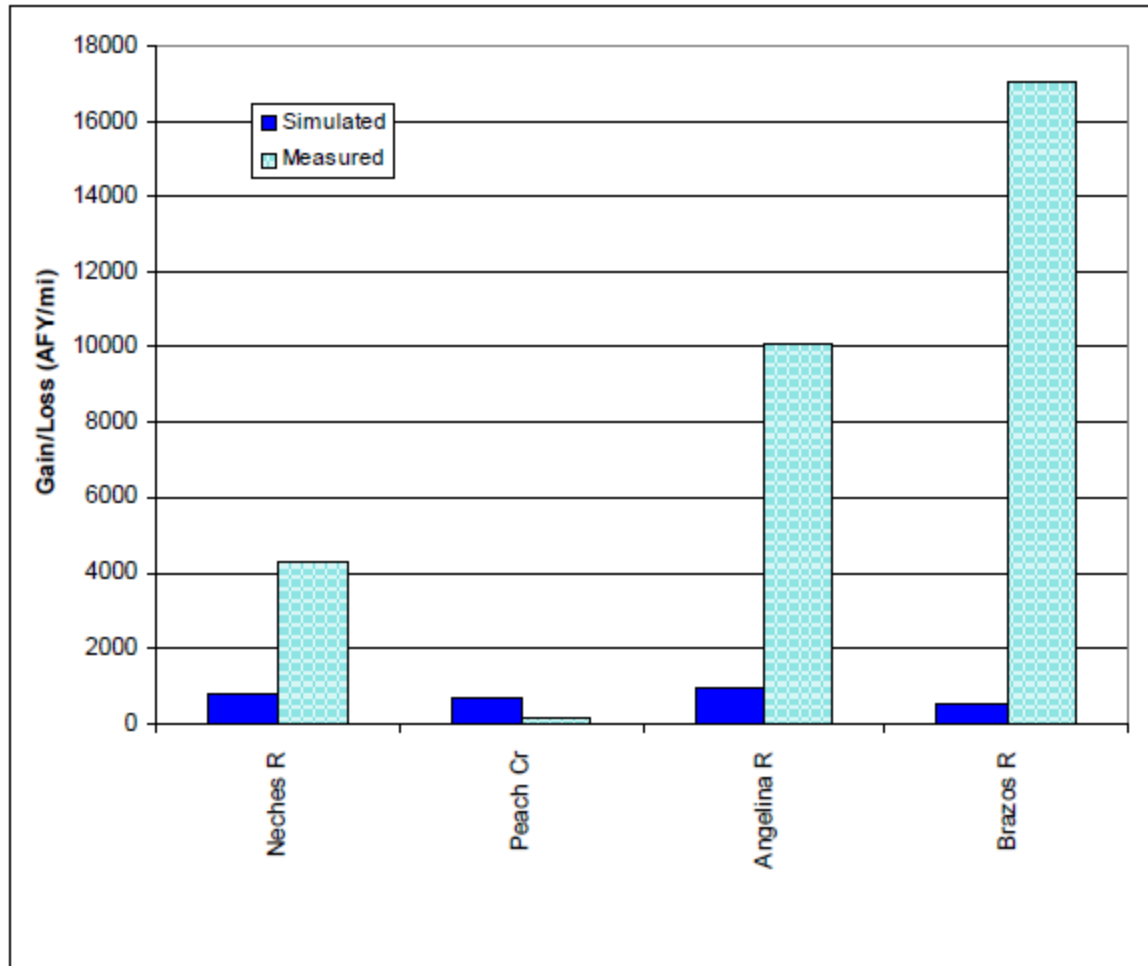


Simulated Stream Flows



R = River Cr = Creek

Simulated Stream Flows



R = River Cr = Creek

Average Drawdown from 1900 to 1997

Zone/Aquifer		Surficial	Upper Jackson	Lower Jackson	Upper Yegua	Lower Yegua
Washington County	1981	-2.8	-1.9	-1.1	-0.2	-0.2
	1991	-1.3	-1.7	-1.5	-0.6	-0.6
	1995	-1.0	-1.5	-1.7	-0.8	-0.8
	Average	-2.1	-1.7	-1.2	-0.4	-0.4
	Maximum	0.0	0.0	0.0	0.0	0.0
Lee County	1981	-0.7	-0.3	-0.3	-0.3	-0.3
	1991	-1.4	-0.9	-0.9	-0.9	-0.9
	1995	-1.5	-1.2	-1.2	-1.2	-1.2
	Average	-0.8	-0.6	-0.6	-0.6	-0.6
	Maximum	0.2	0.2	0.2	0.2	0.2
Burleson County	1981	-1.3	0.2	0.3	0.5	0.5
	1991	-2.5	-0.7	-0.6	-0.4	-0.4
	1995	-2.8	-1.1	-1.1	-0.8	-0.8
	Average	-1.5	-0.3	-0.3	-0.1	-0.1
	Maximum	0.1	1.0	1.1	1.1	1.1
Brazos County	1981	0.4	0.8	0.7	0.6	0.6
	1991	0.6	1.3	1.0	0.8	0.8
	1995	0.7	1.3	0.9	0.7	0.7
	Average	0.5	0.8	0.6	0.5	0.5
	Maximum	0.8	1.4	1.0	0.8	0.8

Note: negative numbers indicate a raise in the average water level

Average Drawdown from 1900 to 1997

Fayette County	1981	8.4	7.7	2.6	1.0	1.0
	1991	10.7	10.4	3.6	1.4	1.4
	1995	10.1	11.1	4.0	1.5	1.5
	Average	7.3	7.0	2.4	0.9	0.9
	Maximum	11.0	11.8	4.3	1.6	1.6
Austin County	1981	13.6	1.5	0.0	-0.1	-0.1
	1991	19.4	2.3	0.2	-0.1	-0.1
	1995	21.1	2.7	0.3	-0.1	-0.1
	Average	13.8	1.6	0.1	-0.1	-0.1
	Maximum	22.5	3.0	0.3	0.0	0.0
Grimes County	1981	4.4	1.7	0.4	0.2	0.2
	1991	8.1	3.4	0.7	0.3	0.3
	1995	9.3	3.8	0.9	0.3	0.3
	Average	5.4	2.1	0.5	0.2	0.2
	Maximum	10.4	4.2	1.1	0.3	0.3
Madison County	1981	0.2	0.2	0.2	0.2	0.2
	1991	0.2	0.2	0.2	0.3	0.3
	1995	0.3	0.3	0.3	0.3	0.3
	Average	0.2	0.2	0.2	0.2	0.2
	Maximum	0.3	0.3	0.3	0.3	0.3
Other County	1981	0.0	0.0	0.0	0.0	0.0
	1991	0.0	0.0	0.0	0.0	0.0
	1995	0.0	0.0	0.0	0.0	0.0
	Average	0.0	0.0	0.0	0.0	0.0
	Maximum	0.0	0.0	0.0	0.0	0.0

Simulated Water Budget for 1997 (AFY)

GCD	Lateral	Recharge	Streams	ET	Drains	GHBs	Reservoirs	Storage	Wells
Bee GCD	-14	0	0	0	0	-199	0	213	0
Bluebonnet GCD	-8,737	47,257	-34,671	-3,754	-43	-1,353	222	2,111	-1,032
Brazos Valley GCD	4,812	26,539	-29,935	0	-5	-45	0	593	-1,658
Coastal Bend GCD	209	0	0	0	0	-604	0	395	0
Colorado County GCD	62	0	0	0	0	-662	0	600	0
Evergreen UWCD	-2,110	41,827	-34,291	-5,239	0	111	0	328	-626
Fayette County GCD	2,328	47,174	-48,802	0	-776	756	0	456	-1,081
Fort Bend Subsidence District	50	0	0	0	0	-362	0	312	0
Goliad County GCD	48	0	0	0	0	-266	0	219	0
Gonzales County UWCD	7,256	26,108	-33,193	0	0	45	0	17	-233
Harris-Galveston Coastal Subsidence District	83	0	0	0	0	-2,829	0	2,746	0
Live Oak UWCD	734	618	-456	-132	0	-1,595	130	711	-9
Lone Star GCD	613	0	0	0	0	-6,992	0	6,379	0
Lost Pines GCD	-4,147	38,859	-33,064	-44	0	0	-73	-880	-651
Lower Trinity GCD	-1,127	4,114	-3,264	-319	-7	-962	0	2,036	-470
McMullen GCD	1,585	7,101	-7,632	0	-45	609	475	-2,046	-46
Mid-East Texas GCD	2,489	31,108	-32,663	0	0	0	0	187	-1,121
Pecan Valley GCD	10	0	0	0	0	-416	0	406	0
Pineywoods GCD	2,816	52,553	-33,247	-8,535	-41	72	-257	-6,937	-6,425
Post Oak Savannah GCD	-3,454	22,459	-11,071	-4,525	0	0	57	-2,572	-778
Southeast Texas GCD	-436	5	31	0	0	-193	0	594	0
Starr County GCD	982	0	-604	-692	-6	449	0	-75	-55
Texana GCD	128	0	0	0	0	-279	0	150	0
Victoria County GCD	201	0	0	0	0	-350	0	149	0
Wintergarden GCD	47	7,618	-5,604	-2,043	0	0	0	6	-24

GCD = Groundwater Conservation District

ET = evapotranspiration

GHBs = general head boundaries