

Figure 17. Extent of the Jackson aquifer outcrop and subsurface extent of the aquifer.

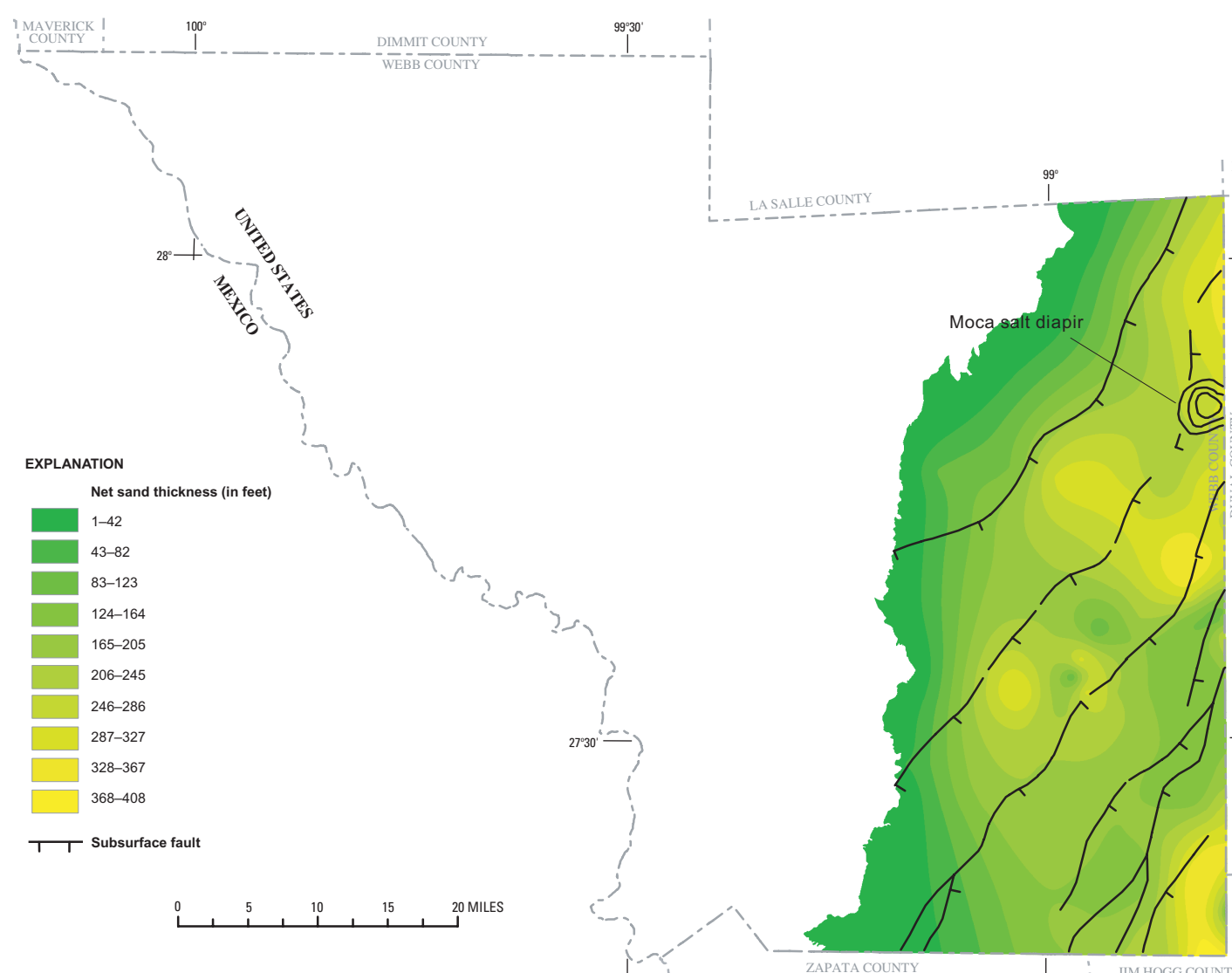


Figure 20. Net sand thickness of the Jackson aquifer.

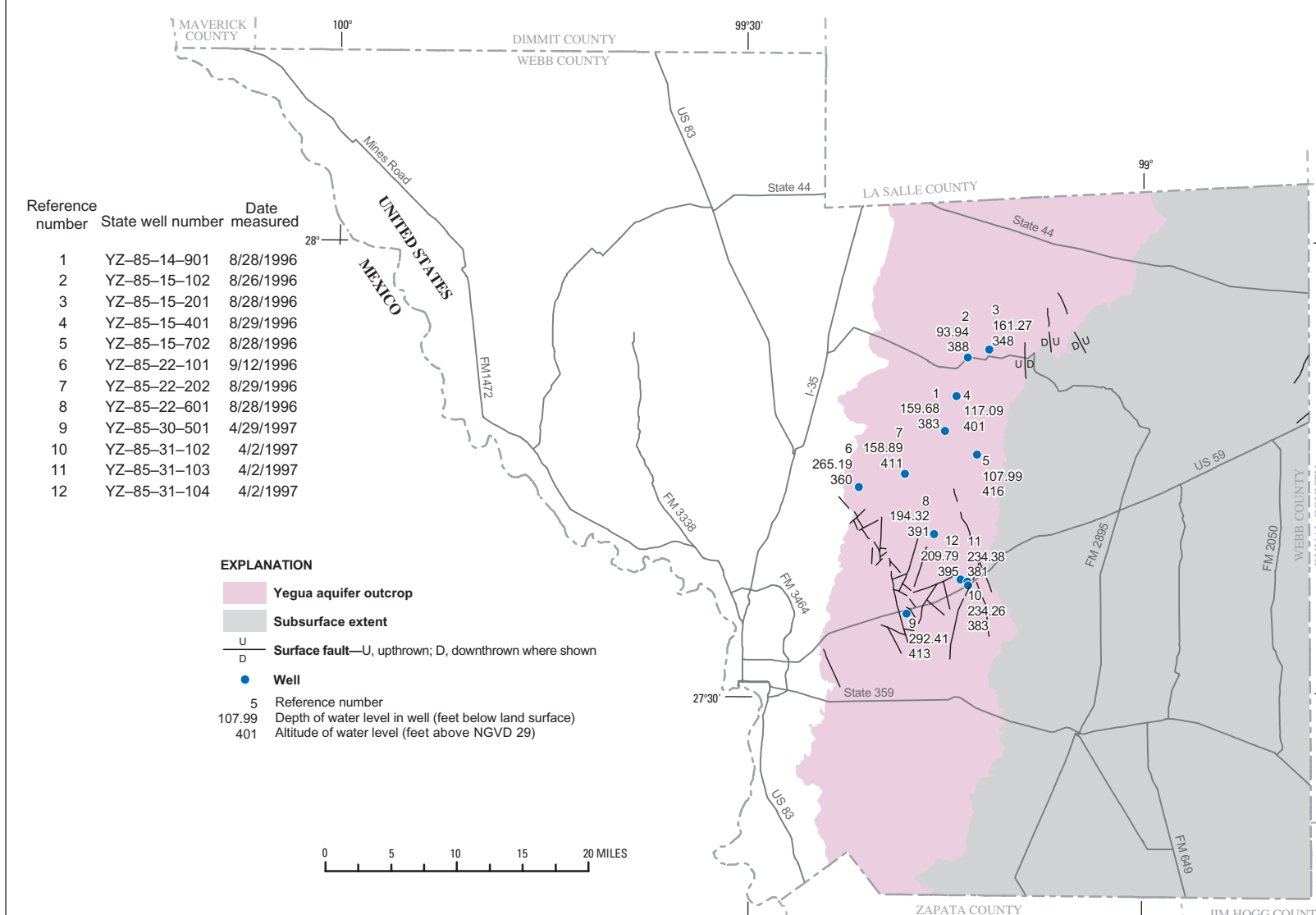


Figure 22. Extent of the Yegua aquifer outcrop, subsurface extent of the aquifer, and depth of water level in wells, 1996-97.

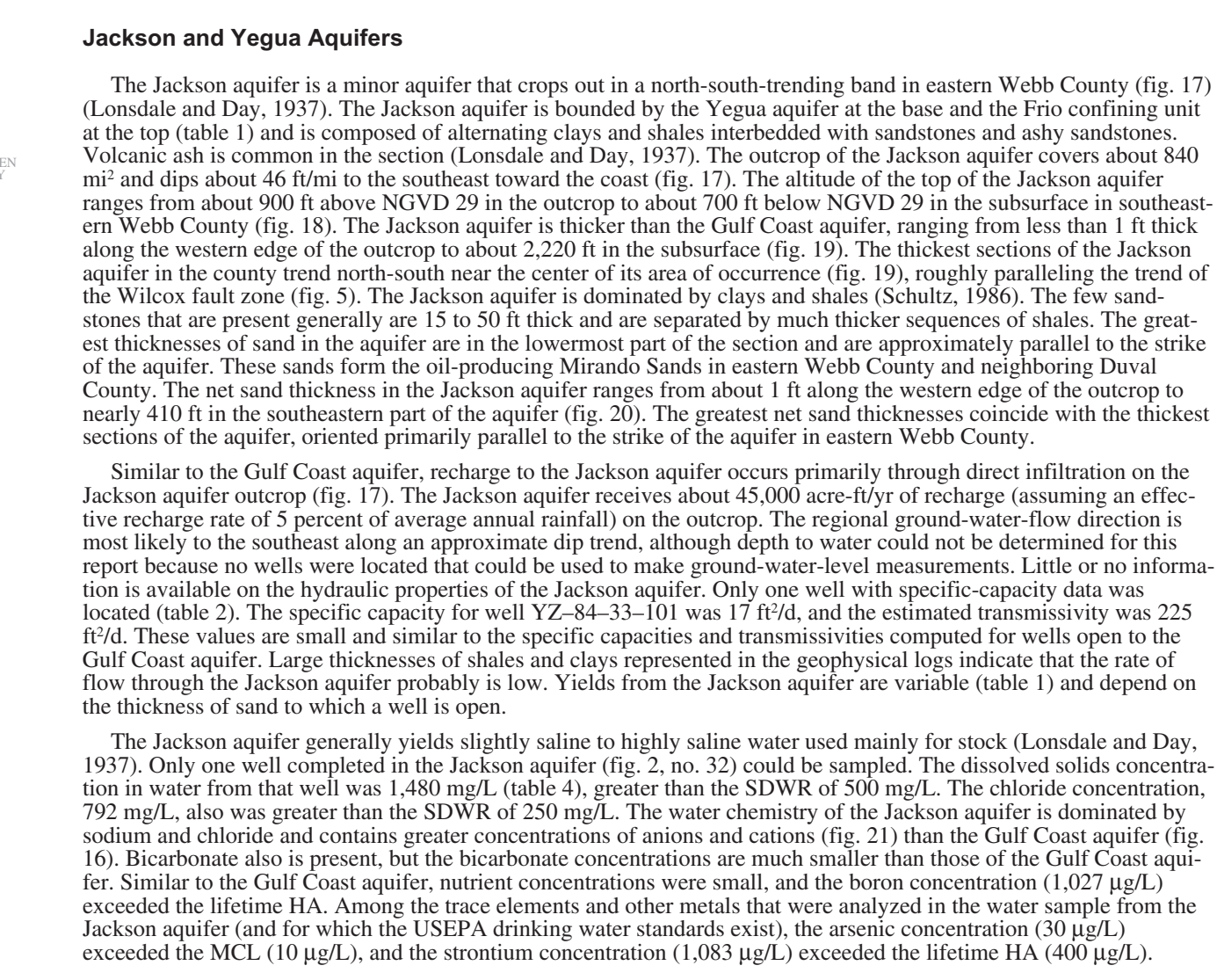


Table 4. Water quality of the Jackson and Yegua aquifers

[ft, feet; gal/min, gallons per minute; µS/cm, microsiemens per centimeter at 25°C; °C, degrees Celsius; mg/L, milligrams per liter; NTU, nephelometric turbidity units; µg/L, micrograms per liter; <, less than; --, not available]

Sampled well number (fig. 2)	USGS station number	State well number	Aquifer	Sample date	Depth of well (ft)	Flow rate (gal/min)	Specific conductance (field) (µS/cm)	pH (field) (standard units)	Water temperature (°C)	Dissolved solids, residue at 180°C (mg/L)	Turbidity (NTU)	Hardness, total (mg/L as CaCO ₃)
31	272726099010001	YZ-85-40-401	Yegua	03/03/1998	2,717	15	7,640	8.5	35	4,470	0.2	13
32	27280409882001	YZ-84-33-101	Jackson	09/10/1997	340	9	2,790	7.9	29	1,480	.48	190

Sampled well number (fig. 2)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Sodium-adsorption ratio	Sodium percentage	Potassium, dissolved (mg/L as K)	Alkalinity (field, total) (mg/L as CaCO ₃)	Bicarbonate, dissolved (mg/L as HCO ₃)	Sulfate, dissolved (mg/L as SO ₄)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)
31	3.2	1.1	1,702	210	99	4.8	770	939	378	1,772	2.4
32	57	10	465	15	84	11	96	117	34	792	.33

Sampled well number (fig. 2)	Silica, dissolved (mg/L as Si)	Nitrogen, nitrate, dissolved (mg/L as N)	Nitrogen, nitrite + nitrate, dissolved (mg/L as N)	Nitrogen, ammonia, dissolved (mg/L as NH ₃)	Nitrogen, ammonium, dissolved (mg/L as N)	Nitrogen, ammonia + organic, dissolved (mg/L as N)	Nitrogen, organic, dissolved (mg/L as N)	Phosphorus, dissolved (mg/L as P)	Phosphorus, ortho, dissolved (mg/L as PO ₄)	Phosphate, ortho, dissolved (mg/L as PO ₄)	Aluminum, dissolved (µg/L as Al)
31	24	<.01	<.05	1.2	0.91	0.96	0.04	<.01	0.04	0.12	4.8
32	23	<.01	<.05	.06	.04	<.2	--	<.01	<.01	--	5.8

Sampled well number (fig. 2)	Antimony, dissolved (µg/L as Sb)	Arsenic, dissolved (µg/L as As)	Barium, dissolved (µg/L as Ba)	Beryllium, dissolved (µg/L as Be)	Boron, dissolved (µg/L as B)	Cadmium, dissolved (µg/L as Cd)	Chromium, dissolved (µg/L as Cr)	Cobalt, dissolved (µg/L as Co)	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)
31	<.4	<.1	86	<.4	4,489	<.4	11	<.4	<.4	96	<.4
32	<.2	<.30	232	<.2	1,027	<.2	2.0	<.2	<.2	81	<.2

Sampled well number (fig. 2)	Lithium, dissolved (µg/L as Li)	Manganese, dissolved (µg/L as Mn)	Mercury, dissolved (µg/L as Hg)	Molybdenum, dissolved (µg/L as Mo)	Nickel, dissolved (µg/L as Ni)	Selenium, dissolved (µg/L as Se)	Silver, dissolved (µg/L as Ag)	Strontium, dissolved (µg/L as Sr)	Uranium, dissolved (µg/L as U)	Vanadium, dissolved (µg/L as V)	Zinc, dissolved (µg/L as Zn)
31	325	31	<.1	6.0	<.4	<.1	0	503	<.4	<.50	<.4
32	94	11	<.1	3.5	<.2	<.1	<.2	1,083	<.2	<.18	<.2

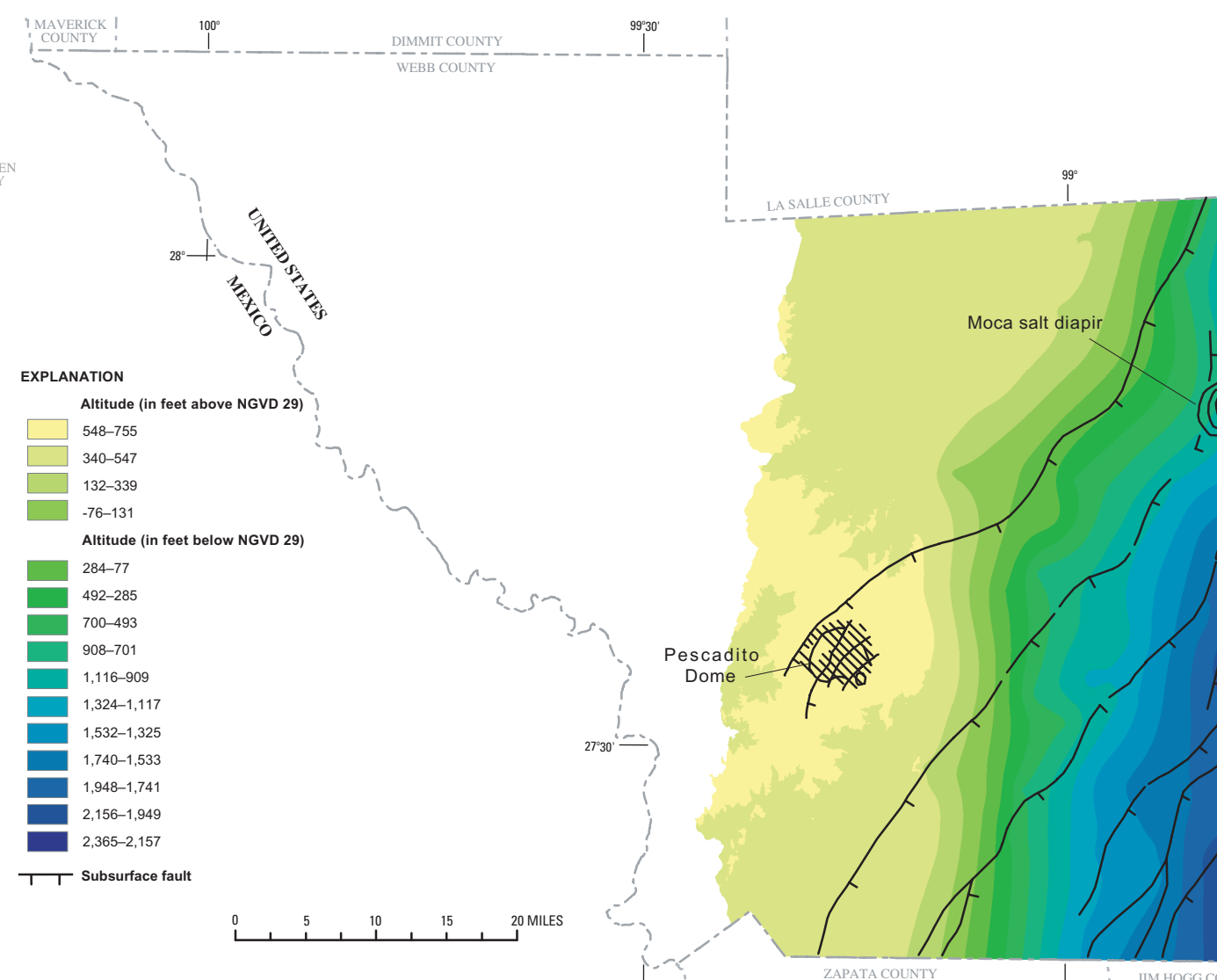


Figure 23. Altitude of the top of the Yegua aquifer.

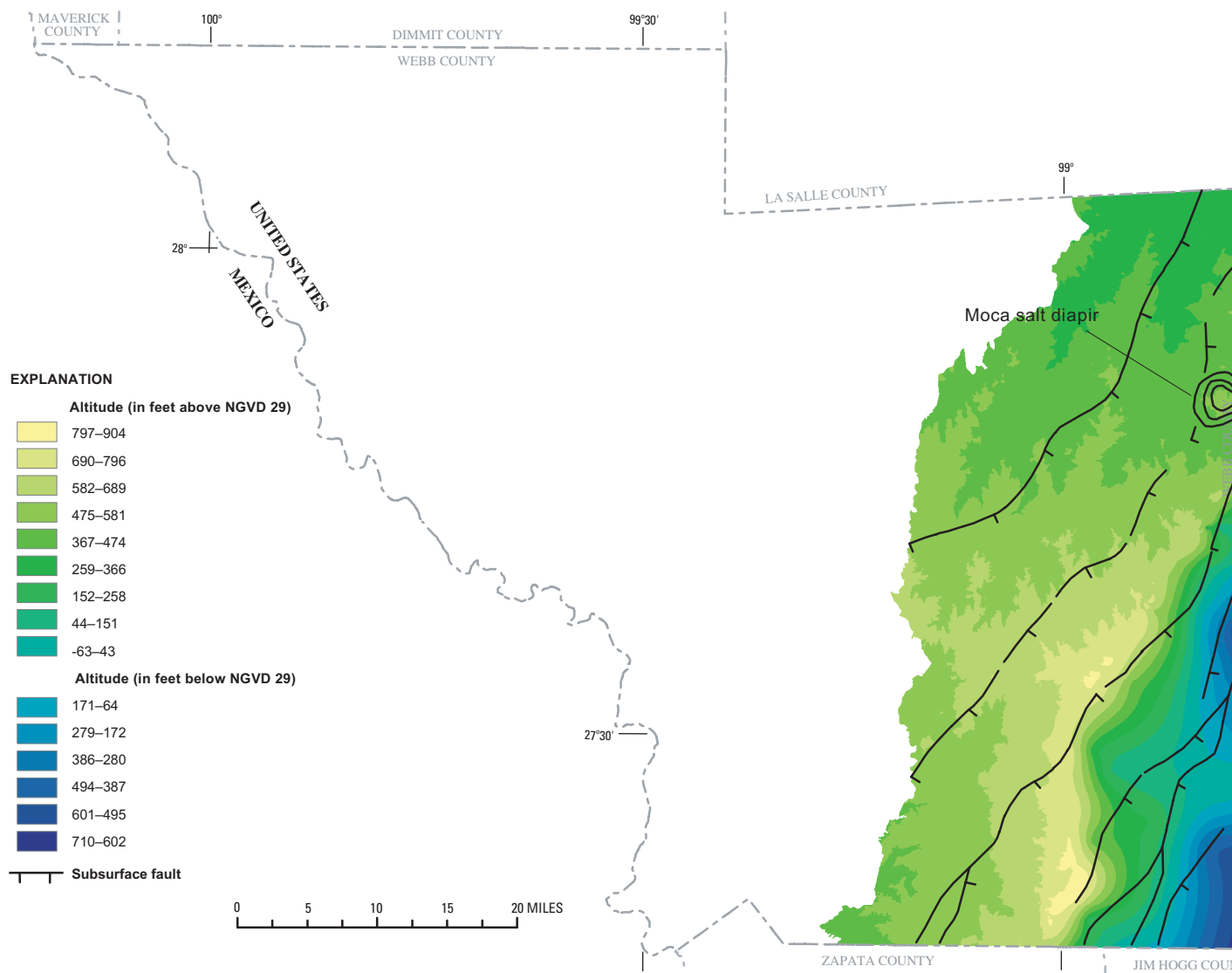


Figure 18. Altitude of the top of the Jackson aquifer.

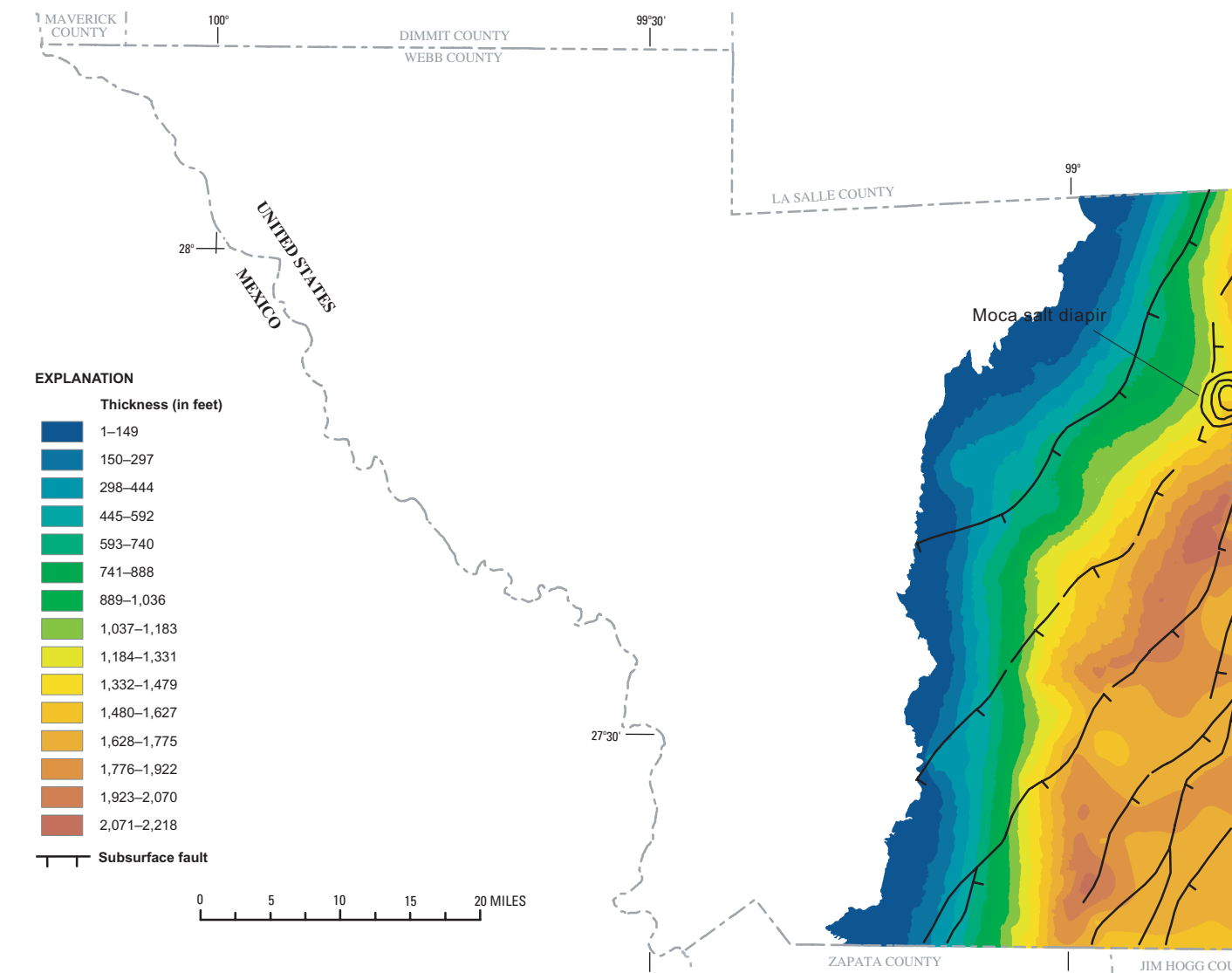


Figure 19. Thickness of the Jackson aquifer.

The Yegua aquifer underlies the Jackson aquifer and consists of clay and sandy clay interbedded with thin beds of sandstone, secondary gypsum, and some concretionary limestone (Lonsdale and Day, 1937). The Yegua aquifer, which crops out in a north-south band in east-central and central Webb County (fig. 22), is a minor aquifer. The altitude of the top of the aquifer ranges from about 750 ft above NGVD 29 in the outcrop to more than 2,350 ft below NGVD 29 in the southeastern part of the county (fig. 23). The outcrop of the Yegua aquifer covers about 690 mi² and dips to the southeast at about 64 ft/mi. The Yegua aquifer in Webb County ranges in thickness from less than 1 ft along the western edge of the outcrop to about 1,480 ft in the subsurface (fig. 24). The net sand thickness of the Yegua aquifer ranges from about 1 ft to more than 410 ft (fig. 25). The thickest net sand sections are downdip in the southeastern part of the county (fig. 25). Sandstones in the Yegua aquifer generally are thin-bedded and stacked and surrounded by thicker sections of clays and shales. Oyster reefs have been observed in the outcrop (Lonsdale and Day, 1937).

Recharge to the Yegua aquifer most likely occurs through direct infiltration of precipitation on the outcrop. Assuming that effective recharge is about 5 percent of the average annual rainfall, the Yegua aquifer receives about 36,900 acre-ft/yr of recharge in Webb County on the outcrop. The regional direction of ground-water flow generally is to the south. The depth to water in wells open to the Yegua aquifer measured for this report ranged from about 94 to 292 ft below land surface (fig. 22). Yields from the Yegua aquifer generally are less than 15 gal/min because there is very little sandstone in the section (Lonsdale and Day, 1937). For this report, no wells open to the Yegua aquifer that had specific-capacity data were located.

Of the aquifers in Webb County, water in the Yegua aquifer generally is the most saline. Water from the Yegua aquifer, used mostly for livestock (Lonsdale and Day, 1937; Winslow and Kister, 1956), is slightly to moderately saline because of abundant gypsumiferous clay beds. One well open to the Yegua aquifer (fig. 2, no. 31) was sampled for this report. Concentrations of dissolved solids (4,470 mg/L), sulfate (378 mg/L), chloride (1,772 mg/L), and fluoride (2.4 mg/L) (table 4) exceeded SDWRs of 500, 250, 250, and 2 mg/L, respectively. Water chemistry from the Yegua aquifer is dominated by sodium and chloride with minor amounts of bicarbonate (fig. 21). No concentration of any metal or trace element exceeded its MCL; however, the strontium concentration (503 µg/L) was greater than the lifetime HA of 400 µg/L. The largest boron concentration from any water sample, 4,489 µg/L, more than seven times the lifetime HA of 600 µg/L, was measured in water from the Yegua aquifer.

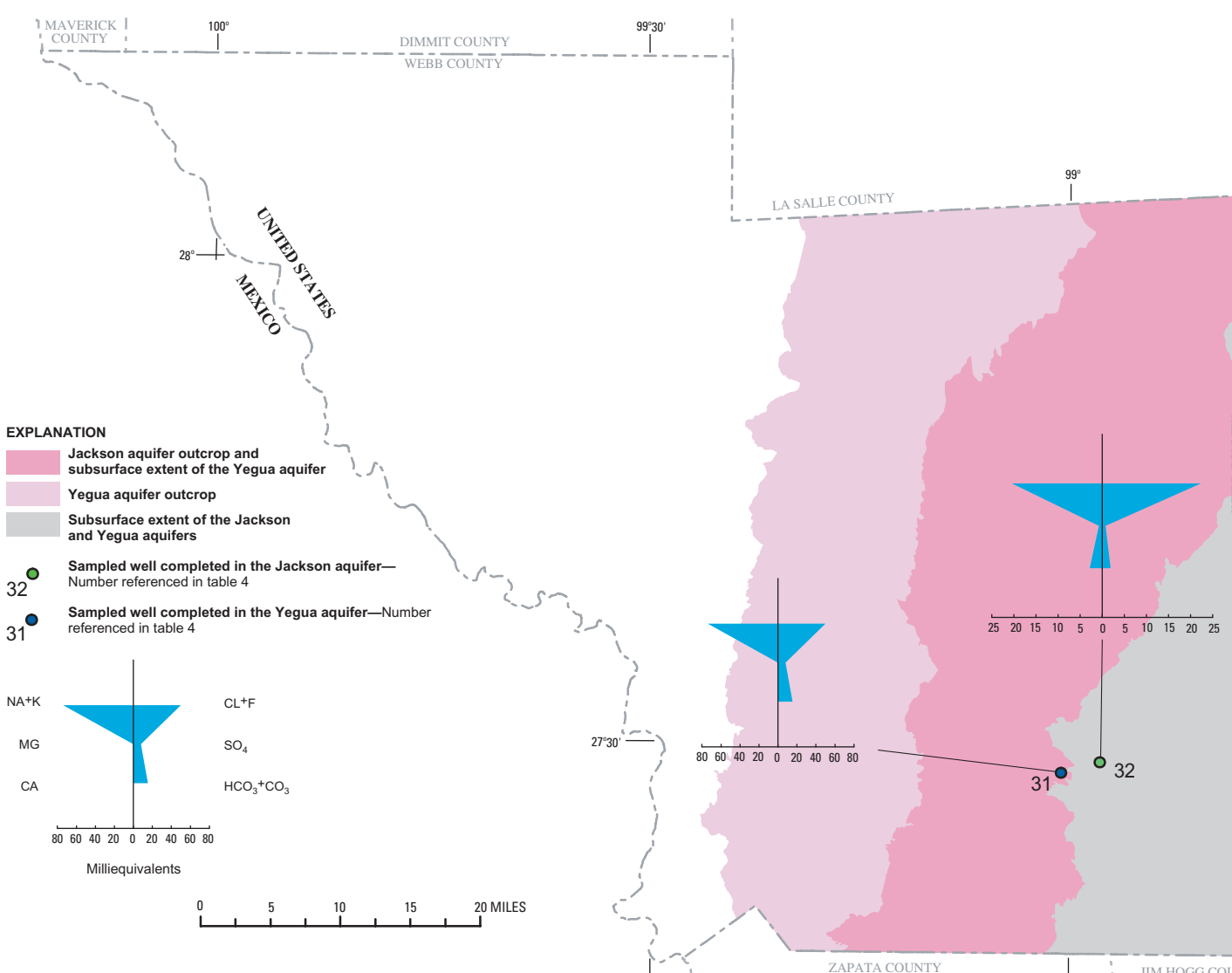


Figure 21. Chemical characteristics of water from the Jackson and Yegua aquifers.

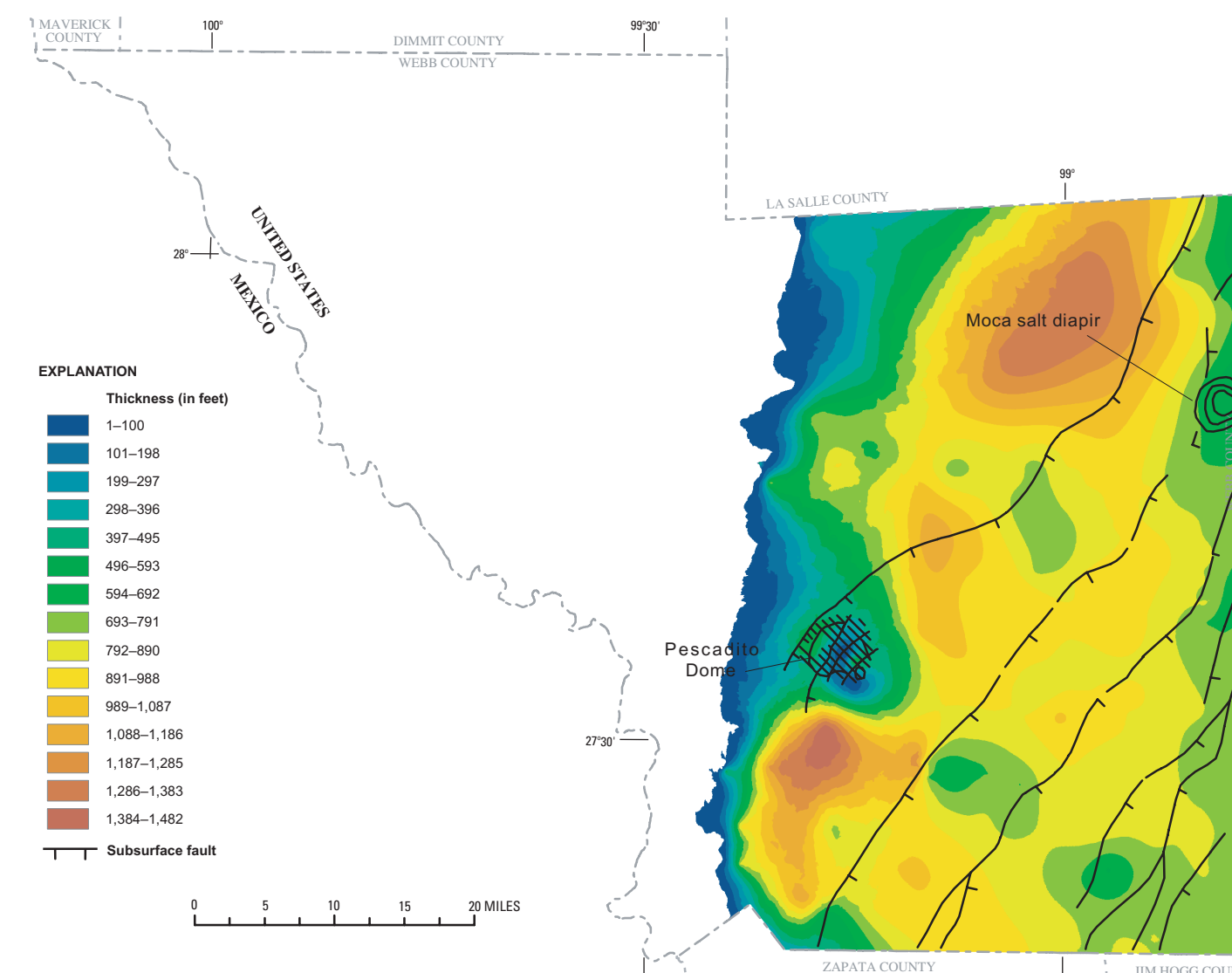


Figure 24. Thickness of the Yegua aquifer.

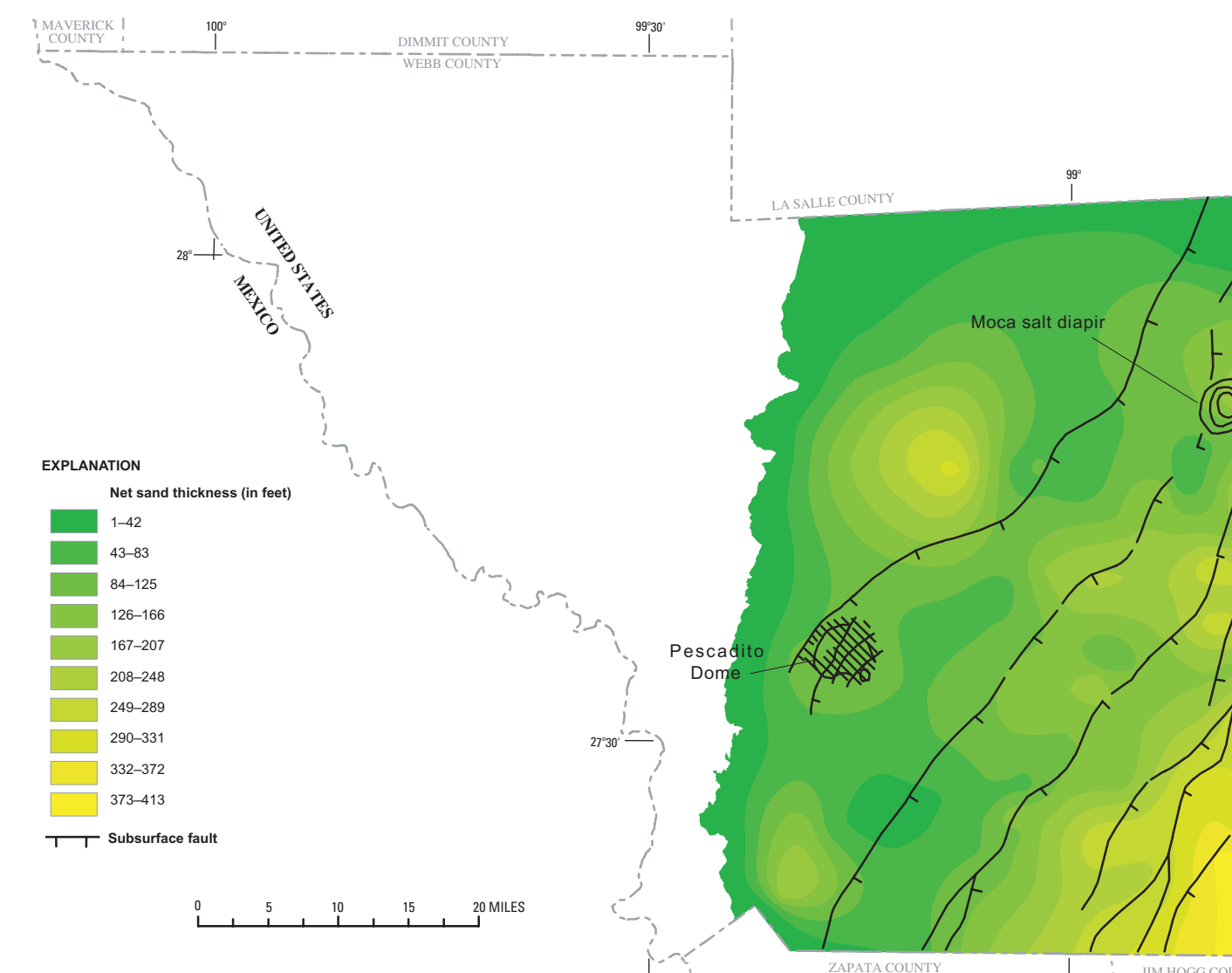


Figure 25. Net sand thickness of the Yegua aquifer.