



WATER-LEVEL CHANGES

The areal distribution of changes in water levels in the Cockfield aquifer between 1968 and 1993 is shown in figure 3. The water-level change map was prepared by comparing the potentiometric-surface maps, and calculating the difference between water levels measured during 1965-75 to those measured during November 1992 through January 1993. Lines of equal water-level change, then, were plotted. A historical potentiometric-surface map was constructed by using water levels measured during 1965-75.

In areas east of the Ouachita River, water levels have changed little in the Cockfield aquifer, even though large withdrawals were made. This probably was due to the rapid recharge of water from the overlying alluvial aquifer. Previous investigators (Poole, 1961, p. 73; Whitfield, 1975, pl. 2; and Sanford, 1973, p. 41) have shown that the Cockfield aquifer is directly recharged by the overlying alluvial aquifer. Rises in water levels up to 50 ft have been measured in the Cockfield aquifer in Natchitoches Parish and Sabine Parish. The rise in water levels in the western part of Sabine Parish has been noted since the filling of Toledo Bend reservoir in 1966 and 1967. The rise in water levels in the other parts of Sabine Parish and in Natchitoches Parish probably is a result of a decrease in withdrawals from the aquifer. Substantial declines in water levels have been measured in the Montgomery-Verda area in Grant Parish.

The long-term trend in water-level changes in selected observation wells in the Cockfield aquifer is shown in figures 4 to 7. Water levels in well Ec-89 (fig. 4) seasonally fluctuate approximately 5 ft/yr. Water levels in well Ri-89 (fig. 5) fluctuate seasonally 1 to 2 ft/yr, water levels generally were between 18 and 21 ft below land surface for the period of record. The hydrograph of well W-3 (fig. 6) shows water levels can fluctuate 16 to 20 ft below land surface on a seasonal basis. Water levels in well Sa-388 (fig. 7) indicate the effects of the filling of Toledo Bend reservoir; water levels rose more than 20 ft in 1967 and 1968.

Withdrawals from the Cockfield aquifer for public supply increased from 1.2 Mgal/d in 1965 to 5.7 Mgal/d in 1985 (fig. 8). In 1990, public supply withdrawals had decreased to 4.2 Mgal/d (J.K. Lovelace, U.S. Geological Survey, written commun., 1993).

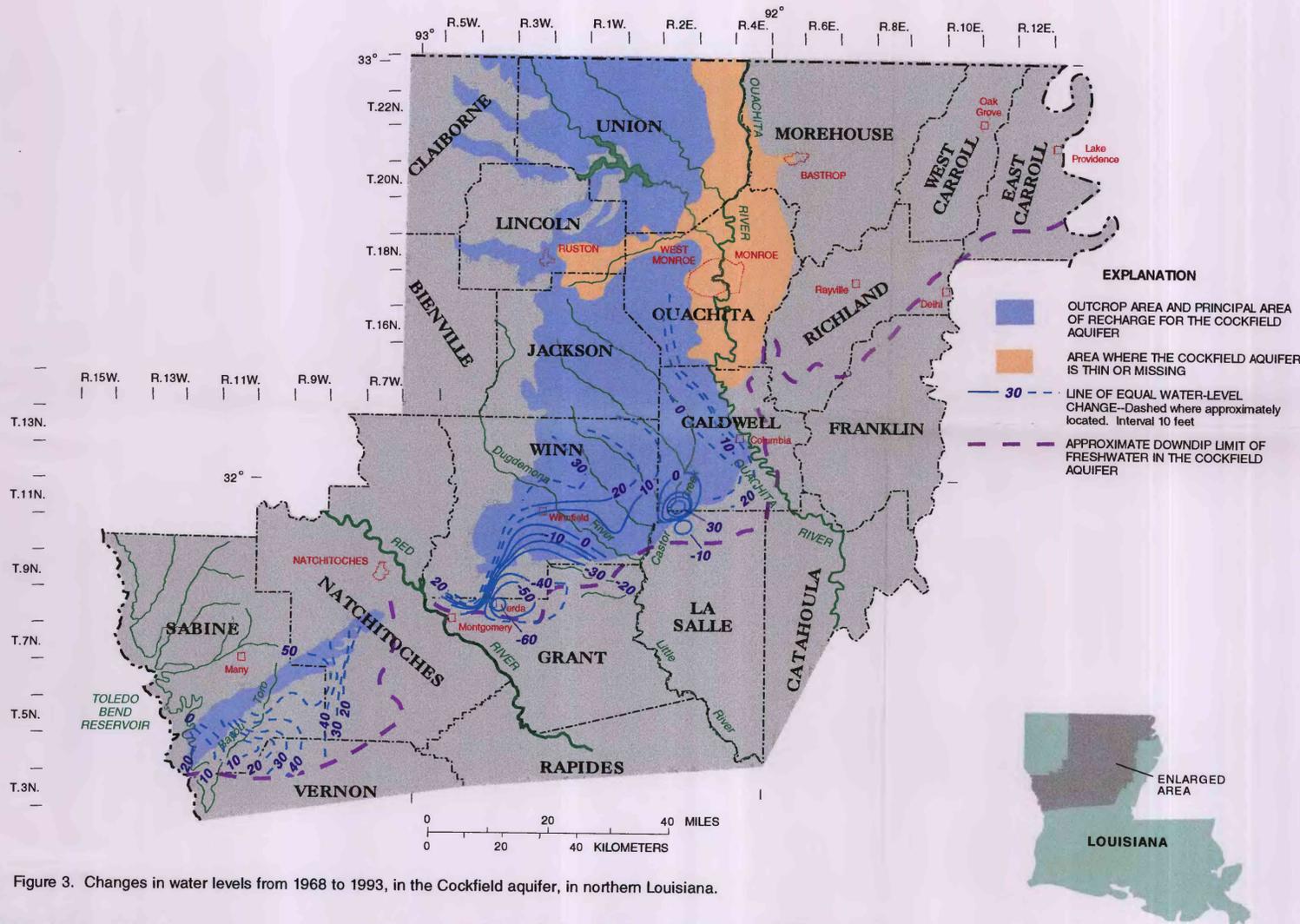


Figure 3. Changes in water levels from 1968 to 1993, in the Cockfield aquifer, in northern Louisiana.

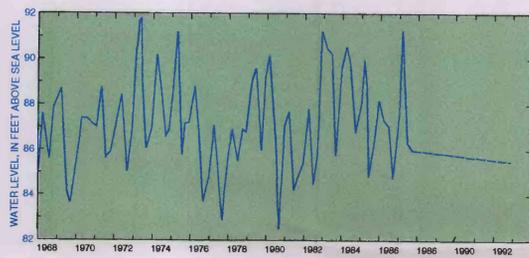


Figure 4. Water level in well EC-89 (East Carroll Parish).

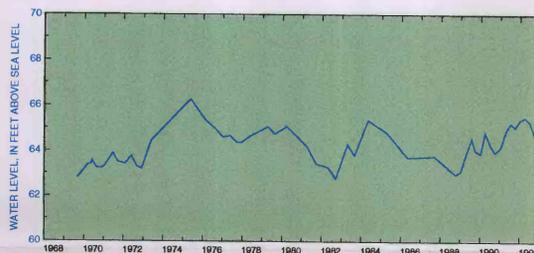


Figure 5. Water level in well RI-89 (Richland Parish).

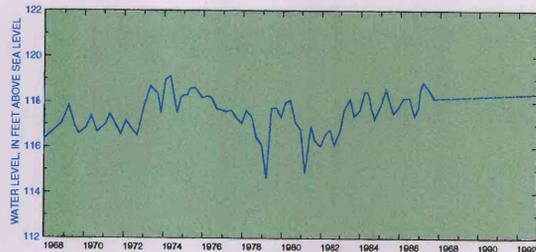


Figure 6. Water level in well W-3 (Winn Parish).

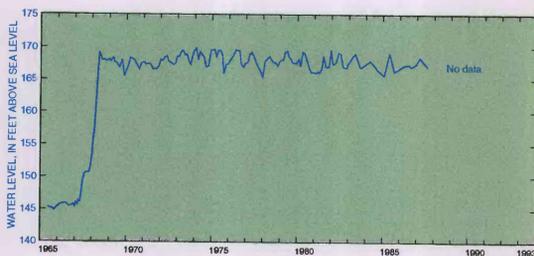


Figure 7. Water level in well Sa-388 (Sabine Parish).

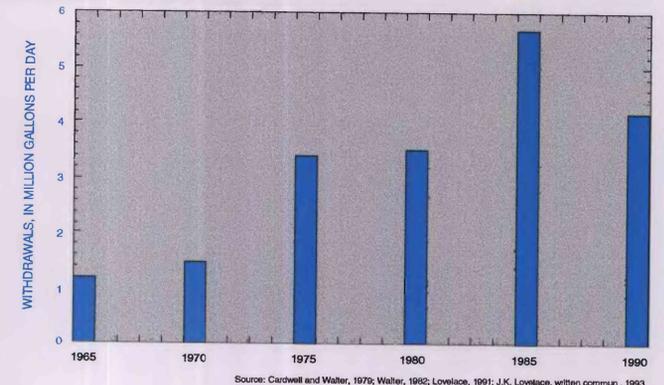


Figure 8. Withdrawals for public supply from the Cockfield aquifer in northern Louisiana, 1965-90.

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**LOUISIANA GROUND-WATER MAP NO. 9:
WATER-LEVEL CHANGES, 1968-93, OF THE COCKFIELD AQUIFER
IN NORTHERN LOUISIANA**

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