The Sparta aquifer is the principal source of ground water in north-central Louisiana. In 1959, the aquifer was extensively pumped for public supply (10,484 Mgal) and industrial use (17,938 Mgal), and 7,164 Mgal were withdrawn for public supply applications. Another 27,900 Mgal were pumped in 1965 for public supply applications. The aquifer has been declining in these areas and in other parts of the north-central region since the early 1960s, when industrial pumping began withdrawing large amounts of water. However, in the vicinity of the Red River, the water level has been recovering since 1965 as a result of a 4.9 Mgal/minute reduction in pumping at Bastrop (J.R. Lowman, U.S. Geological Survey, written commun., 1981).

Additional knowledge about ground-water flow and the effects of withdrawal on the Sparta aquifer is needed for assessment of ground-water resources. Potential potentiometric contour maps are used to determine direction of ground-water flow, ground-water gradients, and the effects of pumping on an aquifer system. The rate of ground-water movement can be calculated when the hydraulic conductivity of an aquifer is known.

This report presents data and maps that illustrate the potentiometric surface and water-level changes for the Sparta aquifer and in the Third in a series of maps reports that show potentiometric surface and water-level changes of aquifers in Louisiana (Reed et al., 1981). Reports are prepared as part of research studies of northern Louisiana with emphasis on the Sparta aquifer. These maps are included in the Selected References.

These maps show the potentiometric surface in the spring of 1989 and water-level changes from 1980 to 1989 for the Sparta aquifer. The regional potentiometric surface of the Sparta aquifer, based on water-level measurements made during May through June 1989, is shown in Figure 1. General-water-flow direction is shown to be from the north to the south. Water-level changes in wells from the Sparta aquifer from May 1980 to May 1989 are shown in Figure 2. These hydrographs (figs. 3-5) show general water-level trends for periods 1930-35, 1940-45, and 1970-75.