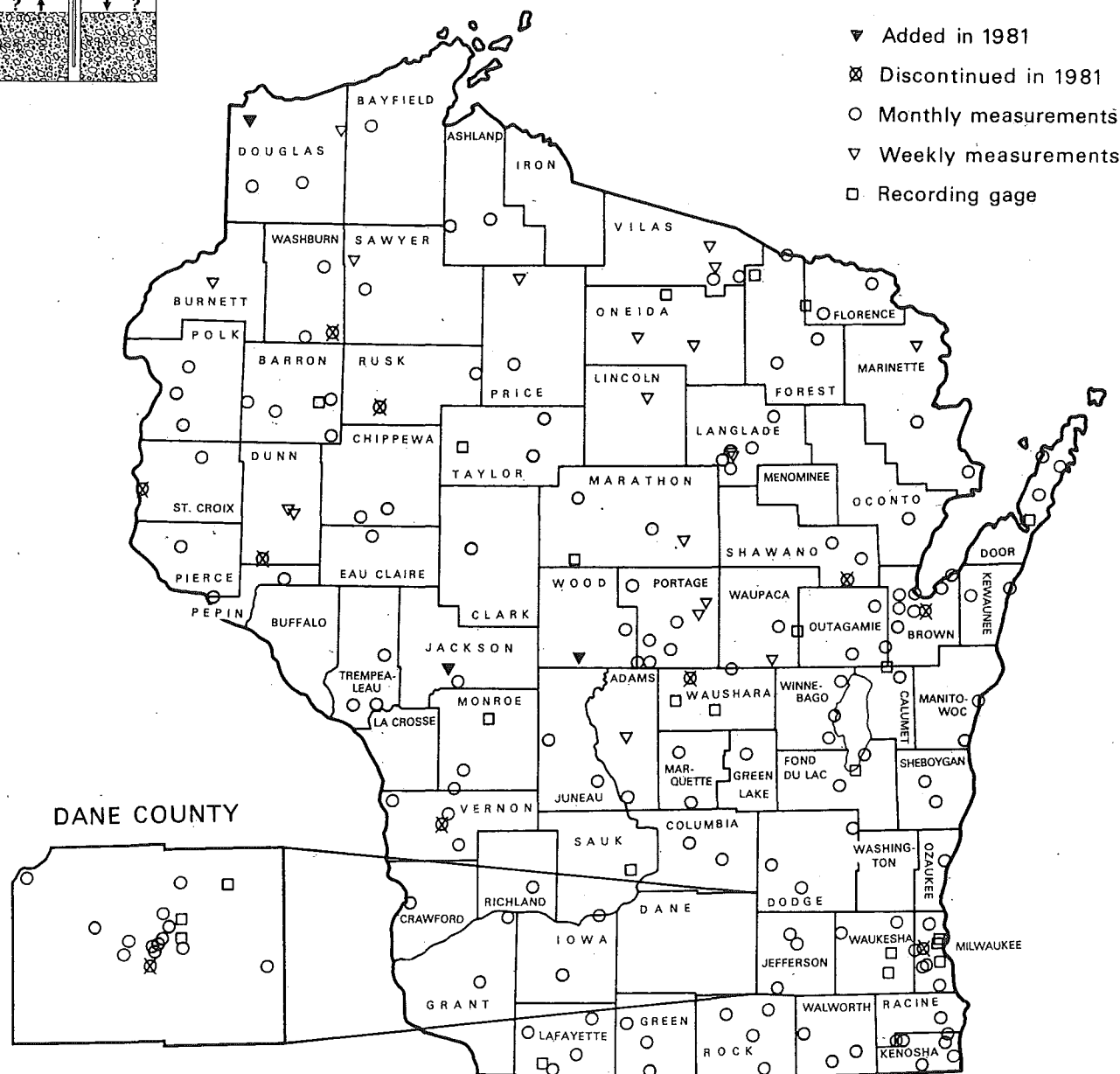


GROUND-WATER LEVELS IN WISCONSIN

ANNUAL SUMMARY 1981

by Alex Zaporozec



LOCATION OF OBSERVATION WELLS IN WISCONSIN, 1981

PREPARED BY

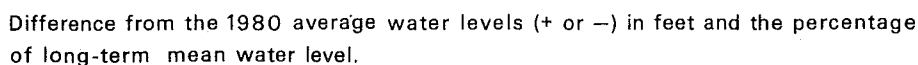
University of Wisconsin-Extension
GEOLOGICAL AND NATURAL HISTORY SURVEY
Water Resources Program
1815 University Avenue, Madison, WI 53706
Telephone: (608) 262-1705

In Cooperation with

U.S. DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY
Water Resources Division
Madison District Office
1815 University Avenue, Madison, WI 53706

Water levels were generally lower at year's end in the eastern part and higher in the western part of Wisconsin. Rising and declining water levels were distributed rather evenly over the state; they rose in 35 counties and declined in 31 counties. Six counties were not measured in 1981. The greatest rise of average levels occurred in the southwest (1.6 - 3.0 feet) and northwest (1.3 - 2.3 feet); water levels rose only slightly elsewhere (0.3 - 0.5 feet). The greatest declines occurred in the heavily-pumped areas of Green Bay and the southeast (4.3 and 5.8 feet).

With respect to long-term average, the water-level trends were mixed and have not changed significantly since 1980. Levels were near or above normal in most of Wisconsin. They were below normal in northeastern, southeastern and central Wisconsin and in parts of northwestern and southwestern Wisconsin.

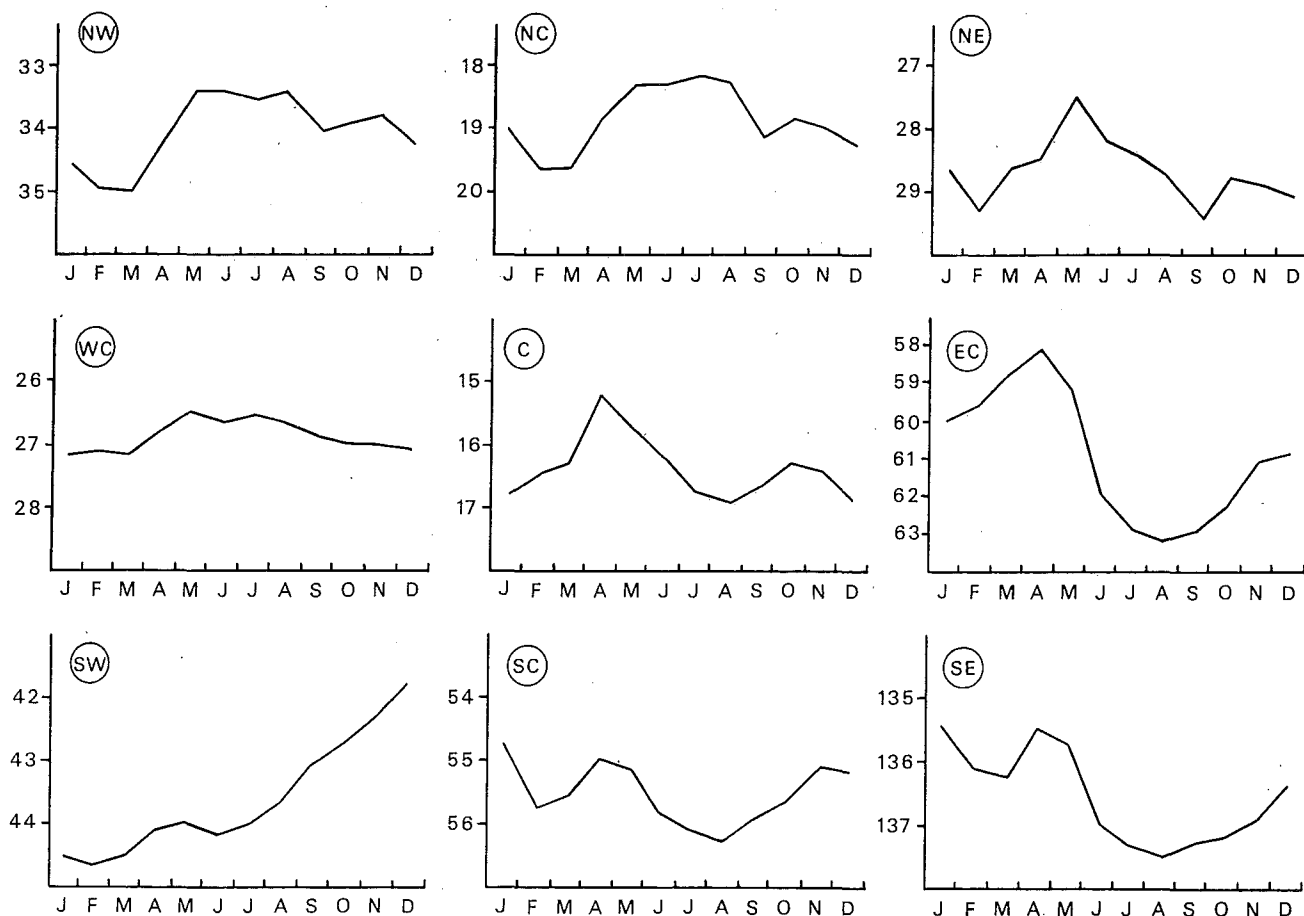


Composite monthly mean water levels for climatic regions shown on page 4 were prepared to illustrate the pattern of water-level distribution throughout the year. They represent average levels for only the observation wells. They are not directly compatible with the means for 1980 because of different number of wells used for calculations.

In most cases the water levels followed the traditional pattern of highest peak in spring, secondary peak in fall, and minimum levels at the end of winter, even though spring peaks were delayed by lack of snowmelt and by an extremely dry March (35 percent of normal, statewide). What little snowpack was in evidence was quickly melted off during the heavy rains and warm temperatures in February and ran off over the frozen ground. Heavy April showers resulted in a rapid rise of water levels in May and June. A small secondary peak occurred in October and November due to frequent showers throughout October. However, this gain was offset by an extremely dry November (55 percent of normal, statewide), and was not sufficient to substantially recharge ground water.

The range of fluctuations was somewhat greater than in 1980, but still relatively small. The largest difference between minimum and maximum level (not counting water levels in wells affected by pumping) was recorded in southwestern Wisconsin, where water levels steadily rose during 1981 and were much higher at the end of the year than at the beginning. Water levels in deep aquifers of east central and southeastern Wisconsin continued their downward trend, and seem to be developing a typical pattern in distribution of monthly means. They start high in January, decline slightly in February and March, temporarily rise in April, and then sharply drop until they reach minimum in August. After that they rise but do not reach the level at the beginning of the year.

COMPOSITE MONTHLY WATER LEVELS IN 1981,
IN FEET BELOW THE LAND SURFACE
(for climatic regions as shown on page 4)



The year 1981 was an average year with statewide precipitation only slightly above normal. However, growing-season rainfall averaged 5 percent above normal. Monthly totals fluctuated wildly from 65 percent below normal in March to 63 percent above normal in April, and followed a zigzag pattern with odd months below normal and even months above normal. The southern counties generally received more rainfall than the counties in the northern half of the state. Precipitation was heaviest in the southwestern and south central districts (7 to 11 percent above normal) and lightest in the northeastern district (9 percent below normal). Stations in Waushara, Vilas, Marinette, Shawano, and Forest Counties recorded precipitation below drought level (85 percent of normal).

Outlook for 1982 water levels will depend on spring recharge conditions. Based on precipitation trends in 1981, we can expect a slight decline in water levels in 1982, unless spring recharge is exceptionally large, with the exception of most of the southwestern and south central areas where the rising trend should continue. Water levels will remain generally average in most of Wisconsin and below average in parts of northwestern, northeastern and central Wisconsin. Gradual decline of levels in the deep sandstone aquifers will continue around Green Bay, Milwaukee-Waukesha, Racine-Kenosha, and Madison, and pumping effects will continue to extend into neighboring counties of Calumet, Kewaunee, Outagamie, Ozaukee, Washington, and Walworth. These declines are attributed to pumping rates, which exceed recharge rates.

