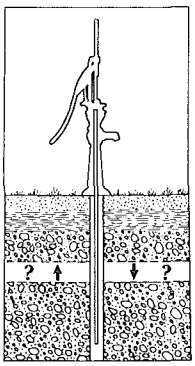
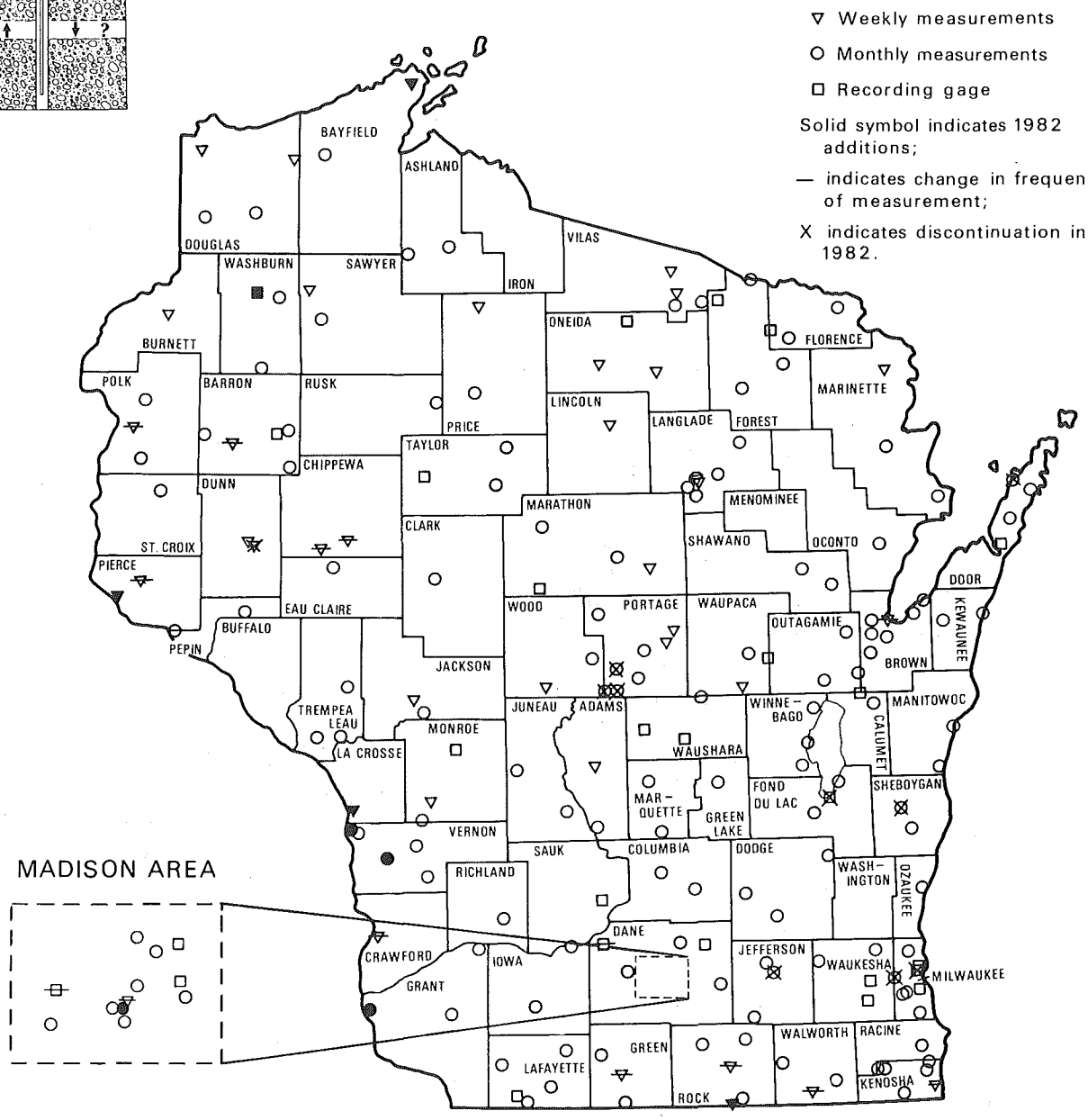


GROUND-WATER LEVELS IN WISCONSIN

ANNUAL SUMMARY 1982

by Alex Zaporozec



LOCATION OF OBSERVATION WELLS IN WISCONSIN, 1982

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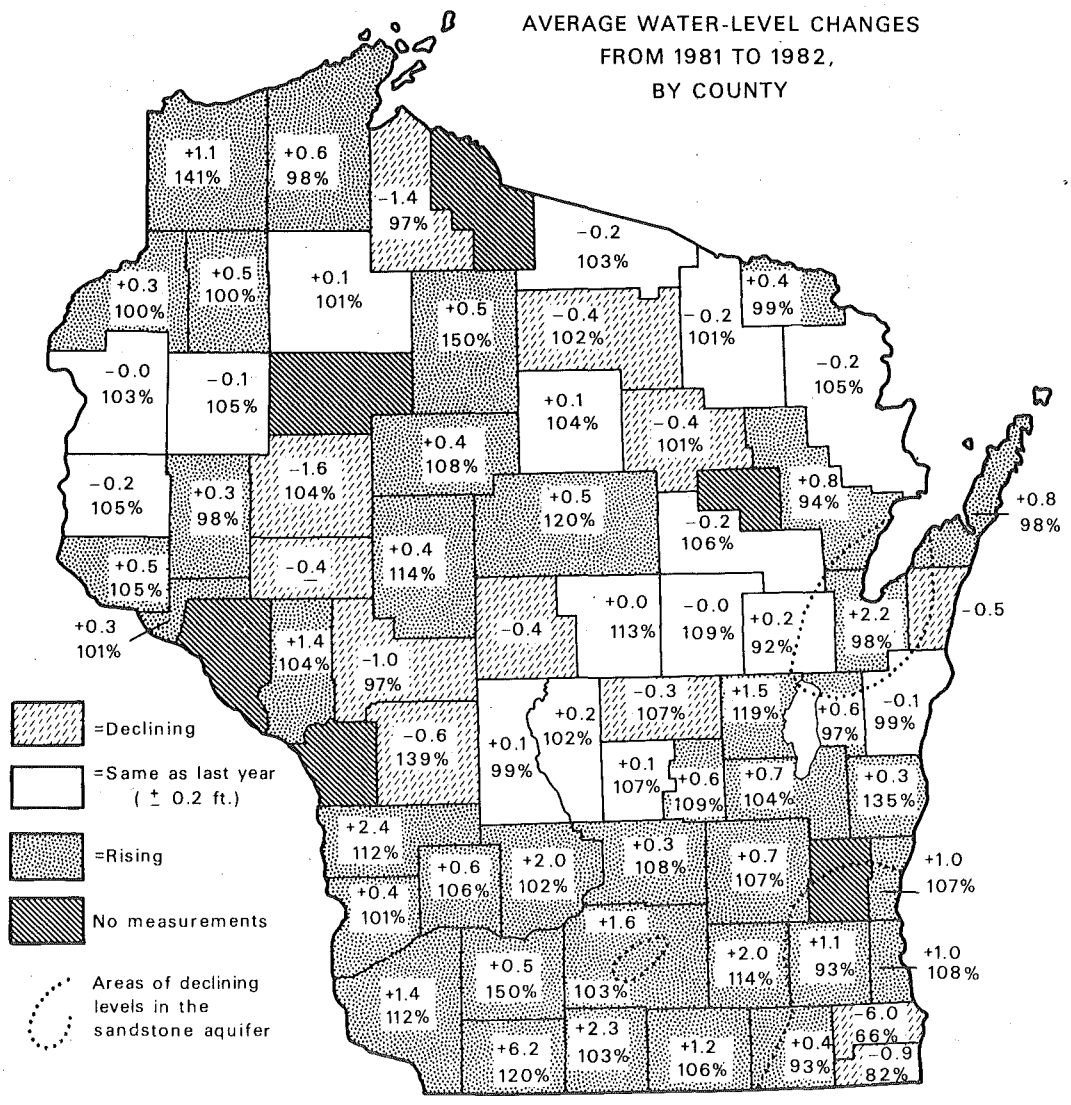
Locations of observation wells shown on page 1 are available on request from the USGS or WGNHS. Measurements were made on 197 wells as compared to 198 wells measured in 1981. Revision of the observation network proceeds according to its recently completed evaluation. Nine wells were added to the program; ten wells were discontinued. The frequency of measurements has been increased from monthly to weekly on 13 wells and new recorders were installed on two wells previously measured monthly.

Ground-water levels were higher at year's end in most counties of Wisconsin. The rise reflects an abnormally wet spring and late fall, which resulted in exceptionally large recharge to ground water. On the average, water levels rose almost one foot; and the greatest rise occurred in southern and east central Wisconsin. They slightly declined in parts of northern and west central Wisconsin; and remained approximately the same as in 1981 in the rest of the state. The replenishment of ground water has been sufficient enough to slow down or even to temporarily reverse the declining levels in the Green Bay area and in parts of SE Wisconsin. However, water levels in Kenosha and Racine counties continued to decline.

With respect to long-term average, ground-water levels were generally average or above average in most of Wisconsin. Below-average trends continued in the central sand plain, in parts of the northwest, northeast, and west central regions, and in the heavily-pumped metropolitan areas of Madison, Green Bay, and SE Wisconsin.



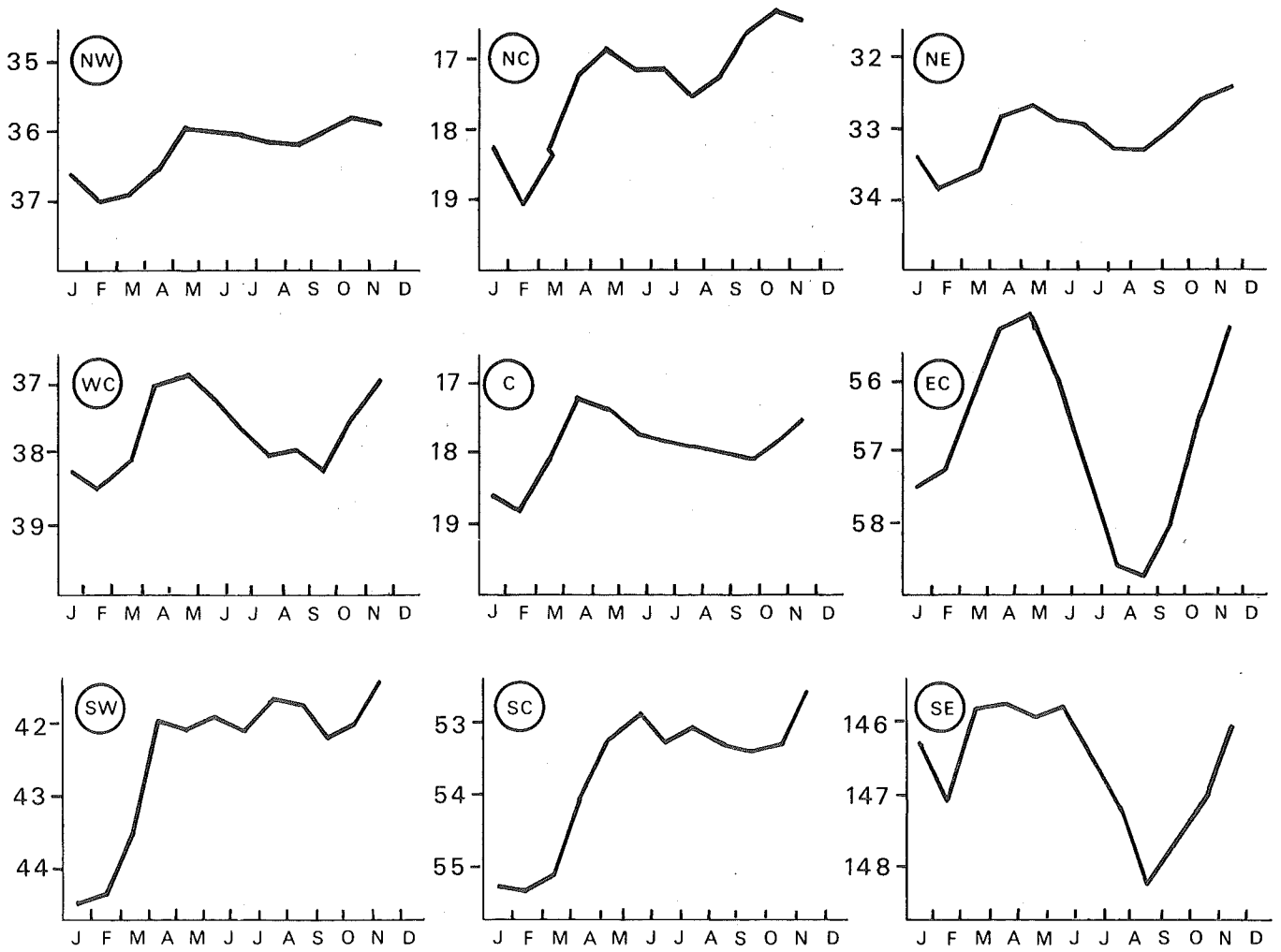
Difference from the 1981 average water levels (+ or -) in feet, and the percentage of long-term mean water level.

Composite monthly mean ground-water levels on the graph below represent average levels for only the observation wells, and are not representative averages of the regions. They are not directly compatible with the means for 1981 because the number of wells used for calculations vary every year.

In most cases, water levels did not follow the usual pattern of fluctuations. Heavy showers in April coupled with early snowmelt resulted in a rapid rise of water levels in the spring. Water levels peaked in April and May, and fluctuated around this level throughout the summer, or slightly declined (in the WC and C regions) until September. The wet October-through-December finish to a generally above-average year contributed large amounts of water for infiltration and water levels were rising even at year's end. Consecutive months of excessive precipitation in the north (esp. in the NC region) resulted in steadily rising water levels throughout the entire year there. Also in SW and SC Wisconsin water levels did not show the traditional gradual decline throughout the summer and remained at about spring peak levels. Even the water levels in deep aquifers of EC and SE Wisconsin, after a sharp drop in September, rose sharply during October through December and reached levels corresponding to spring levels.

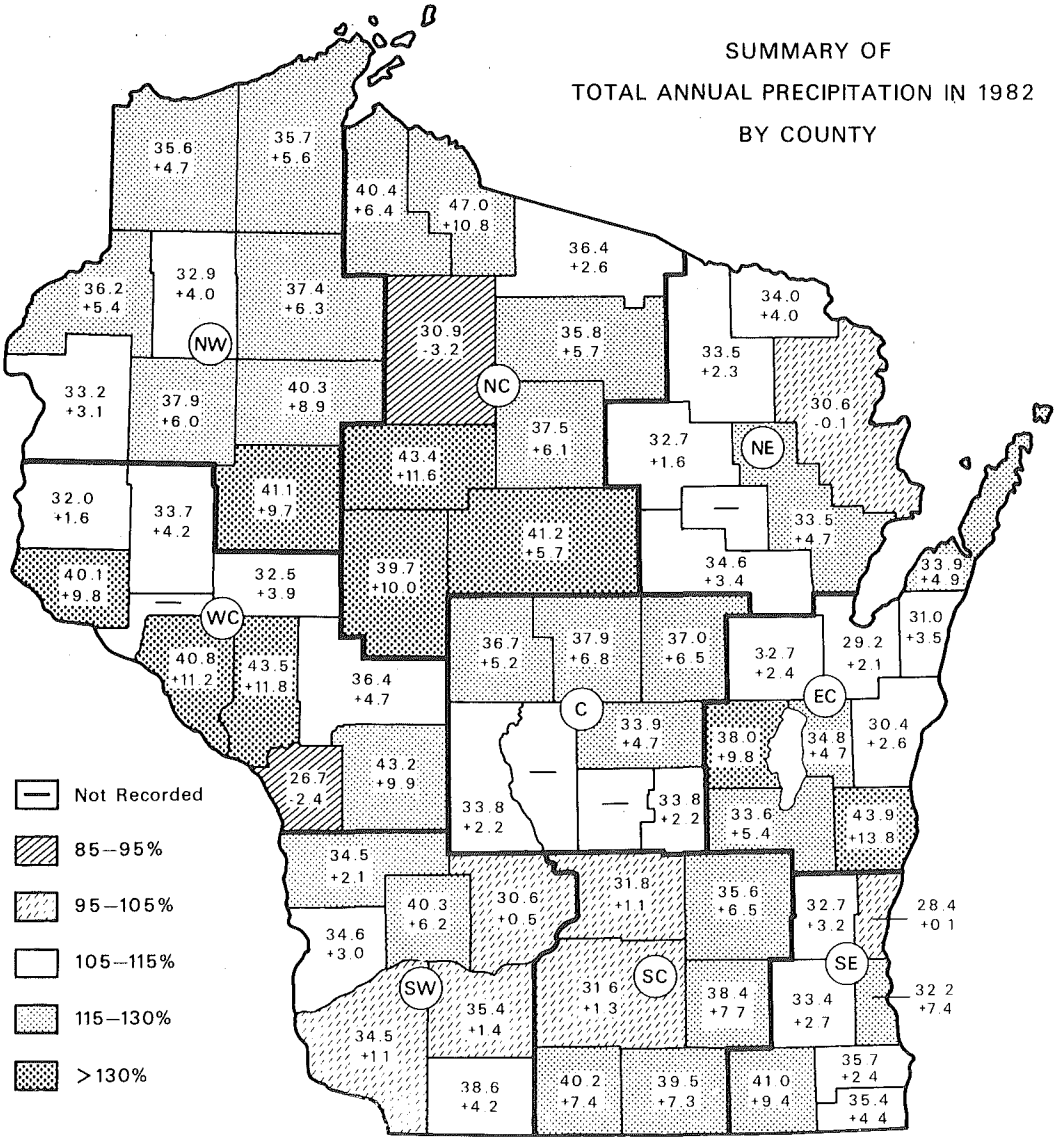
Annual fluctuations of water levels were relatively large due to frequent rains, and ranged, on the average, from 1.75 ft in NW to 5.21 ft in SW. Generally, larger fluctuations were recorded on wells in shallow, unconsolidated aquifers and in fractured rock near the land surface directly responding to recharge by rainfall or to rises in stream or lake stages.

COMPOSITE MONTHLY MEAN WATER LEVELS IN 1982
IN FEET BELOW THE LAND SURFACE
(for climatic regions as shown on page 4)



The year 1982 ranked again as a wet year in Wisconsin. This has been the sixth consecutive year in which statewide precipitation averaged above normal. Statewide rainfall was 11 percent above normal, and all months except February, June, and August were well above normal. October, November, and December represented the wettest fall in memory, with precipitation double normal. Almost all counties received rainfall exceeding the normal by at least 5 percent. Precipitation was heaviest in the west central district (24 percent above normal) and lightest in the northeastern district (3 percent below normal). Average conditions occurred mostly in parts of southern Wisconsin.

Based on precipitation trends in 1982, we can expect that water levels in 1983 will start fairly high. The ground began to freeze later than usual and most of the heavy precipitation during November and December infiltrated already well-saturated soil and, therefore, substantially recharged the ground water. Winter decline of water levels will be short and slight. Water levels are likely to peak in early spring and maintain higher levels throughout the year in most of Wisconsin, unless the summer is unseasonably dry. Below-average water levels are likely to continue in parts of Adams, Bayfield, Dodge, Douglas, Dunn, Florence, Green, Juneau, Langlade, Monroe, and Wood counties. Gradual declines of levels in the sandstone aquifer, caused by heavy pumping in Wisconsin metropolitan areas, will continue to expand around the Green Bay-De Pere, Milwaukee-Waukesha, Racine-Kenosha, and Madison pumping centers.



Average annual precipitation and departure (+ or–) from normal precipitation, in inches, and the percentage of normal precipitation.