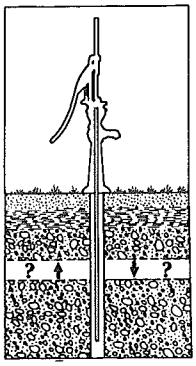
Wisconsin Geological and Natural History Survey
Educational Series 15



# GROUNDWATER LEVELS IN WISCONSIN ANNUAL SUMMARY 1987

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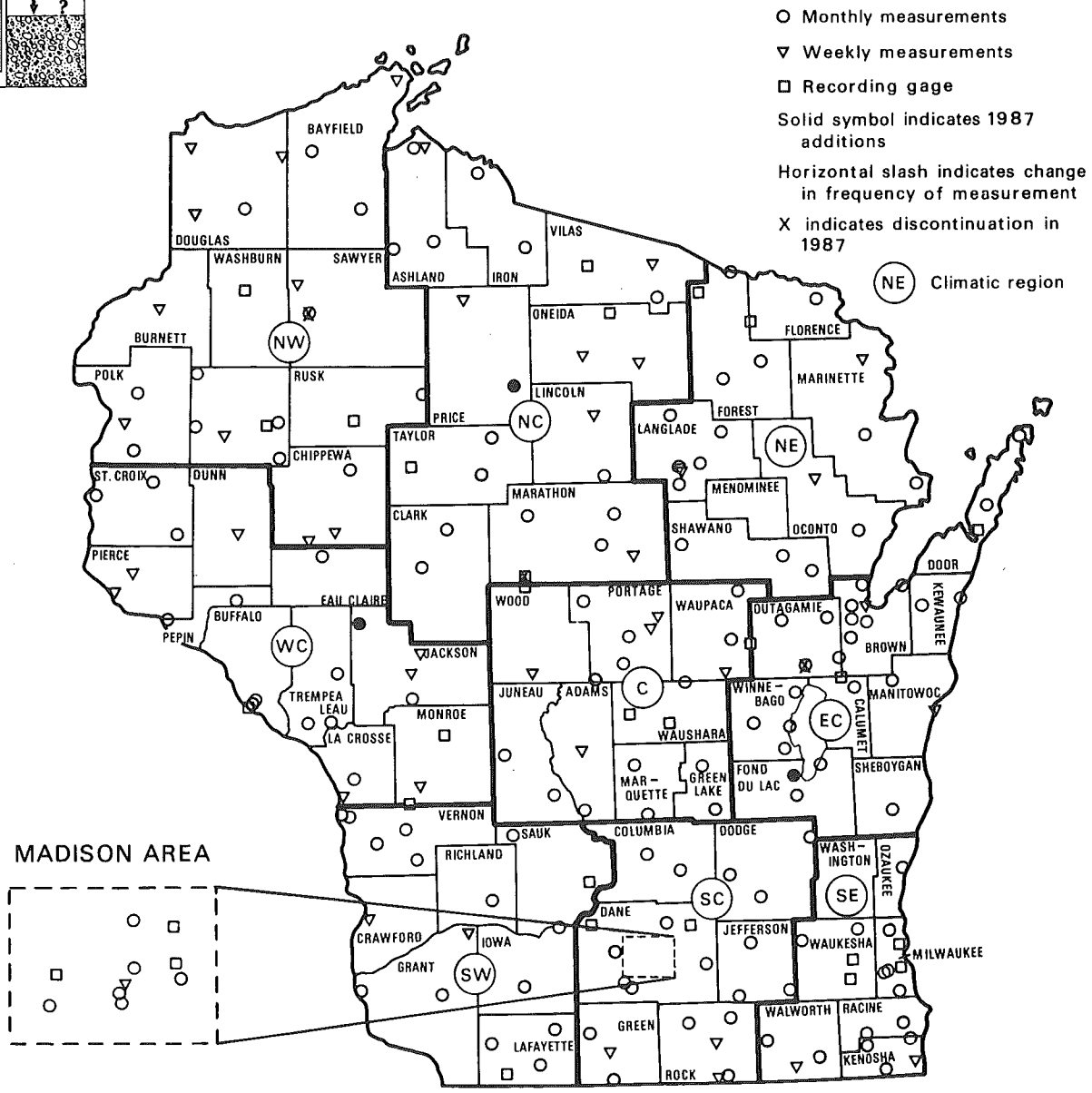
(Data compilation and computation: Neil Simmons and Kathy Kane)




LOCATION OF OBSERVATION WELLS IN WISCONSIN, 1987

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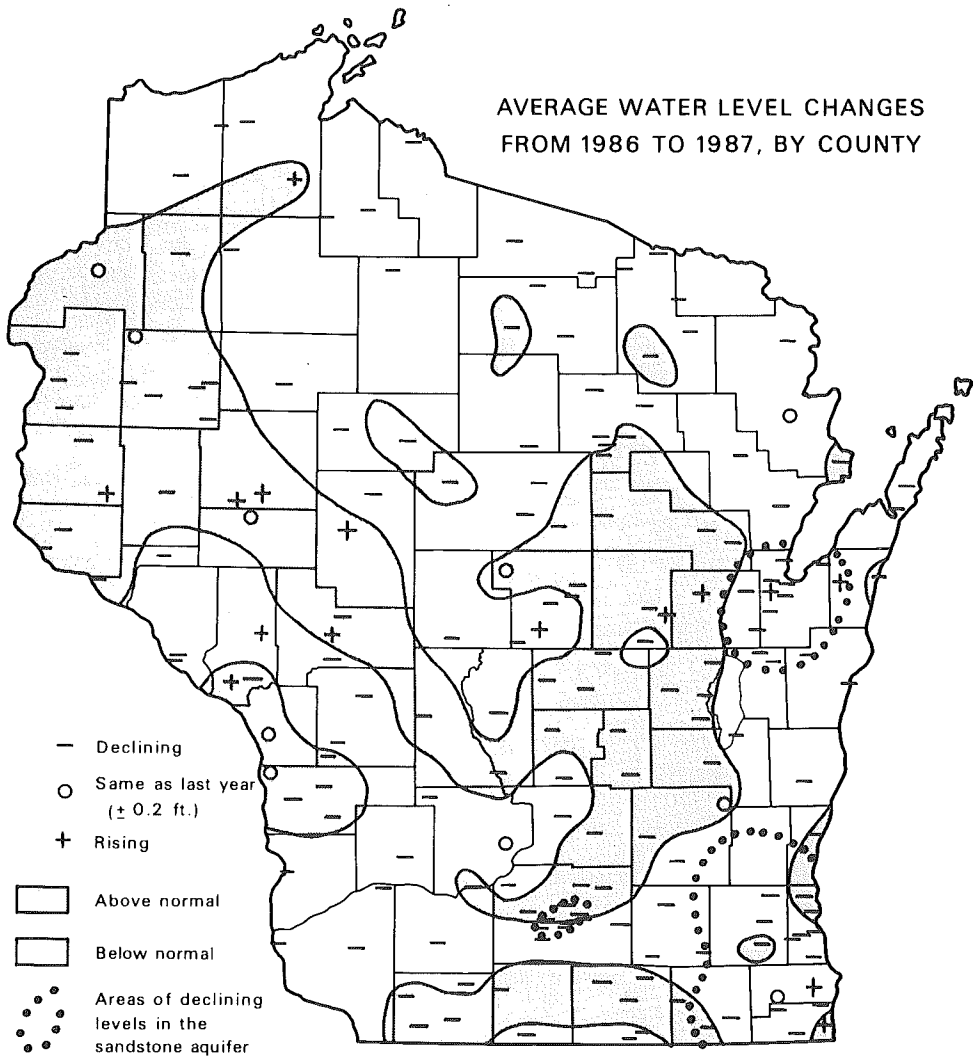
Since 1946 The Wisconsin Geological and Natural History Survey (WGNHS) and the U.S. Geological Survey (USGS) have operated a network of observation wells around the state to monitor groundwater level fluctuations. In 1987 measurements were made on 214 observation wells, the same number as in 1986. Three wells were added to the network, and three wells were discontinued. Locations of and records for the observation wells shown on page 1 are available from the WGNHS and USGS.

The general trend of rising water levels has ended after five consecutive years. Typical trends for 1981-87 are shown on hydrographs of selected key wells on page 4. Water levels in 90 percent of Wisconsin observation wells were lower at year's end than in 1986; average water levels in Wisconsin dropped about 1.3 ft. (For most of the wells, average water levels were between 0.5 to 2 ft lower than in 1986.) The map below shows that the average water levels remained the same or rose only in some wells in the west-central, southwestern, and extreme southeastern parts of the state. The greatest declines (more than 2 ft) occurred in the extreme northwest, southwest, south-central, southeast, and east-central Wisconsin.

In comparison with long-term means, water levels in Wisconsin observation wells are returning to normal after several years of above-normal levels. In 1987 water levels were about evenly distributed between above normal and below normal. Water levels remained above normal in northwest, west-central, and central Wisconsin; below-normal levels were prevalent in the north-central, northeast, southwest, east-central, and southeast parts of the state.



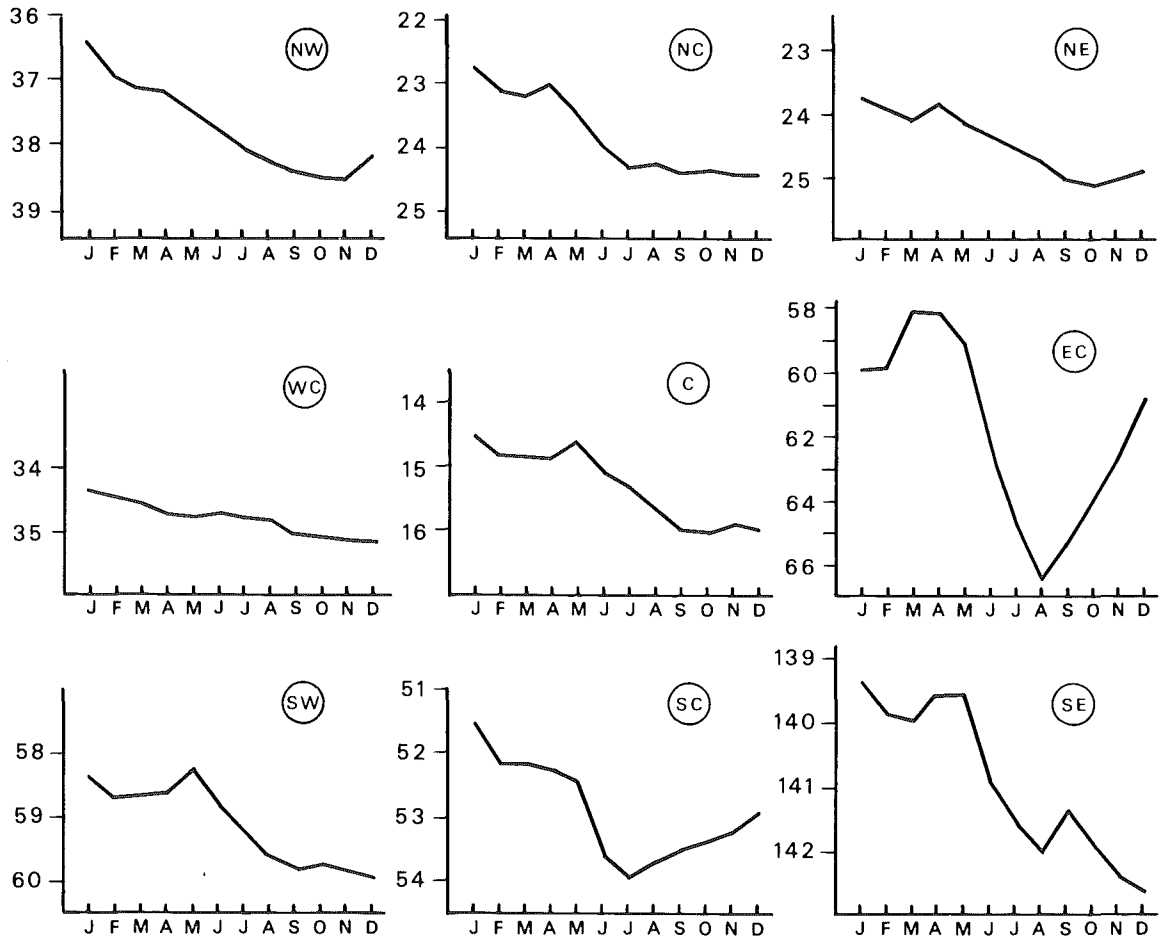

Difference from the 1986 average water level (+ or –), and relation of 1987 water levels to long–term means.

The composite monthly mean water levels on the graphs below are not directly comparable to those of previous years because the number of wells in each region varies slightly every year. However, the means show the representative patterns of water-level fluctuations within the climatic regions shown on page 1.

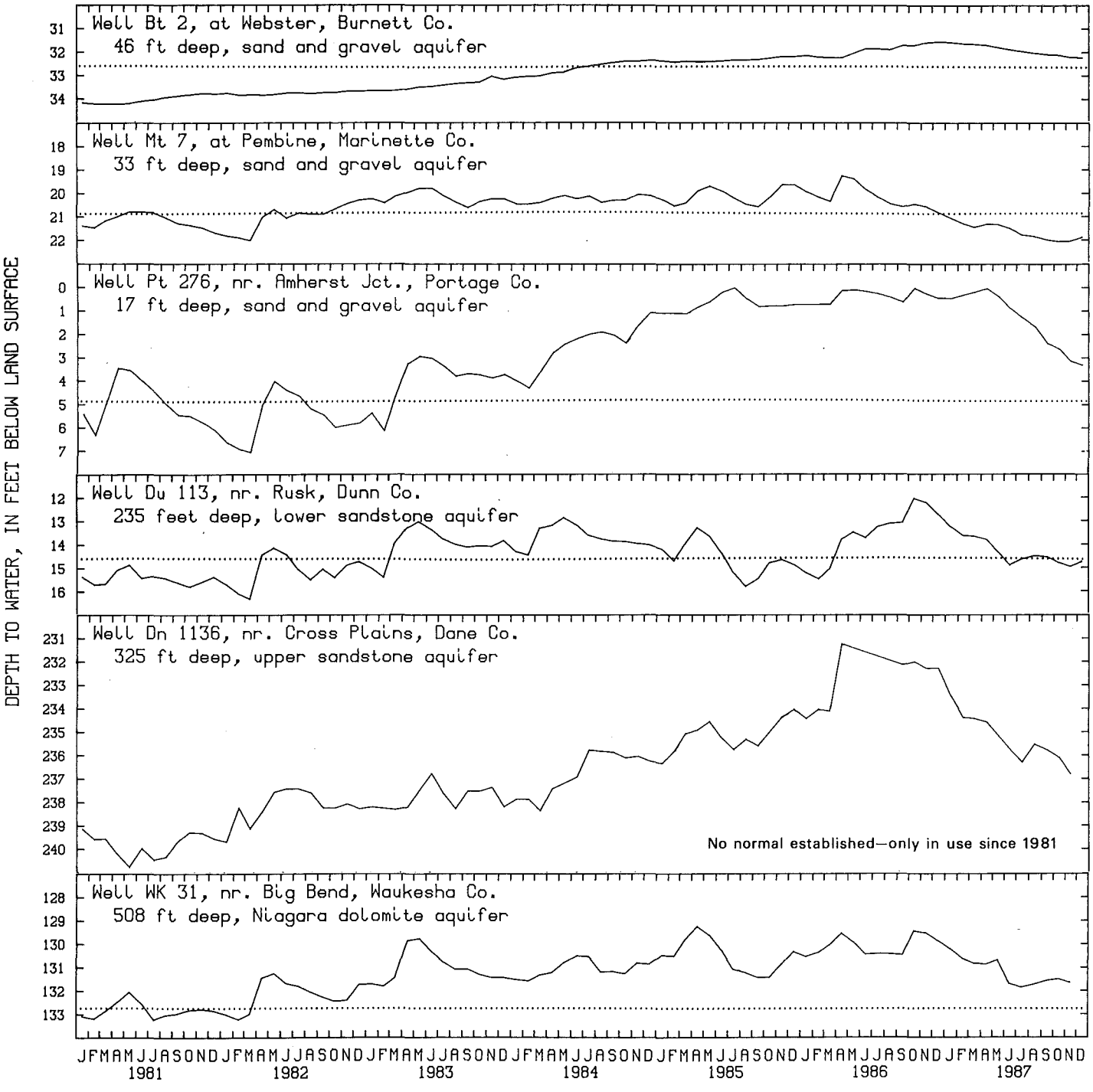
In 1987 water levels in Wisconsin did not follow the traditional pattern of highest peaks in spring, secondary peaks in late fall, and minimum levels at the end of winter and late summer. With the exception of climatic regions EC and SW, water levels peaked at the beginning of the year. Water levels did not rise in the spring because there was very little snow accumulation, and occasional spring rains (approximately 50% of normal) were not sufficient to significantly recharge the groundwater reservoirs. Spring recharge was only able to reverse or slow down temporarily the decreasing trend in six of the nine regions. Water levels continued declining from May to late summer and recovered somewhat in the fall. Late summer and early fall rain provided needed recharge, which was not sufficient to offset losses in groundwater storage but kept water levels from further declines.

Annual fluctuations ranged from 0.3 ft to about 10 ft. On the average, the smallest difference between the annual minimum and maximum was recorded in west-central Wisconsin (1.8 ft) and the largest in east-central Wisconsin (4.4 ft). Large fluctuations (more than 10 ft) were recorded in the fractured dolomite aquifer in Door County and in the confined sandstone aquifer in the east affected by continuing heavy pumping.

COMPOSITE MONTHLY MEAN WATER LEVELS IN 1987, BY CLIMATIC REGION, IN FEET BELOW THE LAND SURFACE



## HYDROGRAPHS OF SELECTED KEY WELLS, 1981–1987




30 year normal water level

Plots courtesy of U.S. Geological Survey