

## The Normal 1983-84 Winter

by

John W. Enz  
Agricultural Climatologist  
Department of Soil Science  
NDSU, Fargo, ND 58105

Donald E. Stoltz  
Meteorologist in Charge  
National Weather Service  
Bismarck, ND 58501

The 1983-84 winter may have been unusual, but it will go into the record books as a normal winter. Average temperatures for December, January, and February ranged from near 0 to 2°F over the state. These temperatures were slightly below normal in the east central region and in portions of the west (Figure 1). The remainder of the state was near normal to 3°F above (Figure 1).

Averages or normals are useful for comparing the weather from one month or season <sup>to</sup> another year, but they are often very misleading. This year is an excellent example because December was very cold and February was very warm. The typical weather pattern in the Northern Great Plains is one of tremendous variation, especially in winter, and averages cover up this variation. There is no reason for the temperatures to be average or normal. In fact the normal situation is for temperatures to be below normal for several days or longer and then be above normal for a period of time. The length of these cold or warm periods varies depending on the general weather pattern that is dominating the area.

Average December temperatures ranged from -3°F in eastern North Dakota to -7°F in the northwest. These December temperatures were 12 to 20°F below the long term normal (Figure 2). This was one of the coldest Decembers on record.

For example, Williston and Minot reported average temperatures of -4.5° and -4°F, respectively which were new record lows. At Fargo the -0.3°

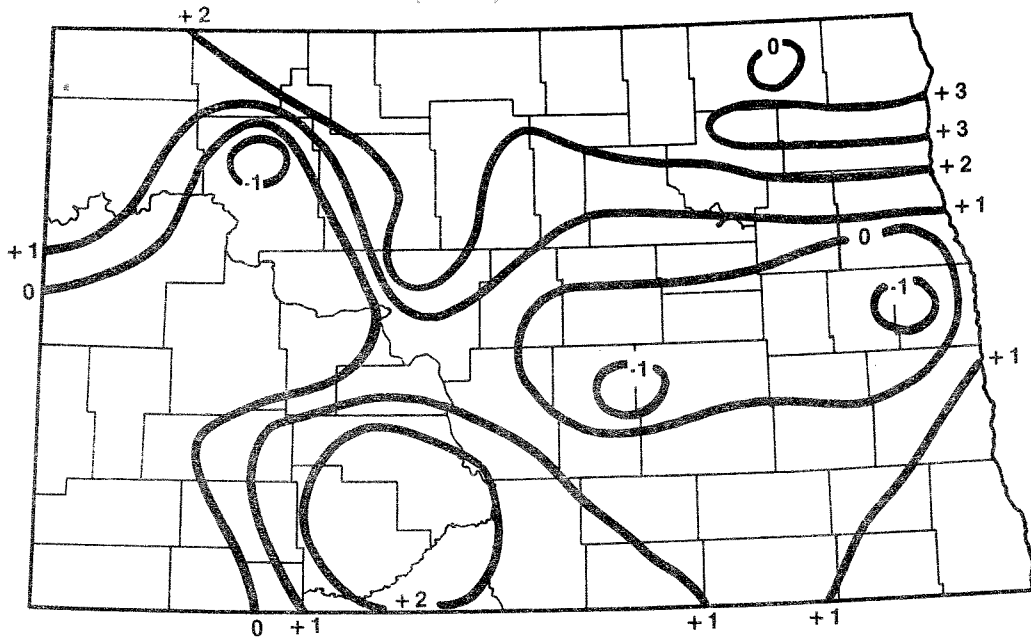
reported tied the record low while at Bismarck and Langdon December was the second coldest on record.

December was also a month of extremes when many daily low temperature records were broken. At Williston there were record lows of  $-40$  and  $-50^{\circ}\text{F}$  on the 19th and 23rd, respectively. The  $-50^{\circ}$  tied the all time low temperature in Williston. At Bismarck record lows were reported on the 19, 22, and 23rd.

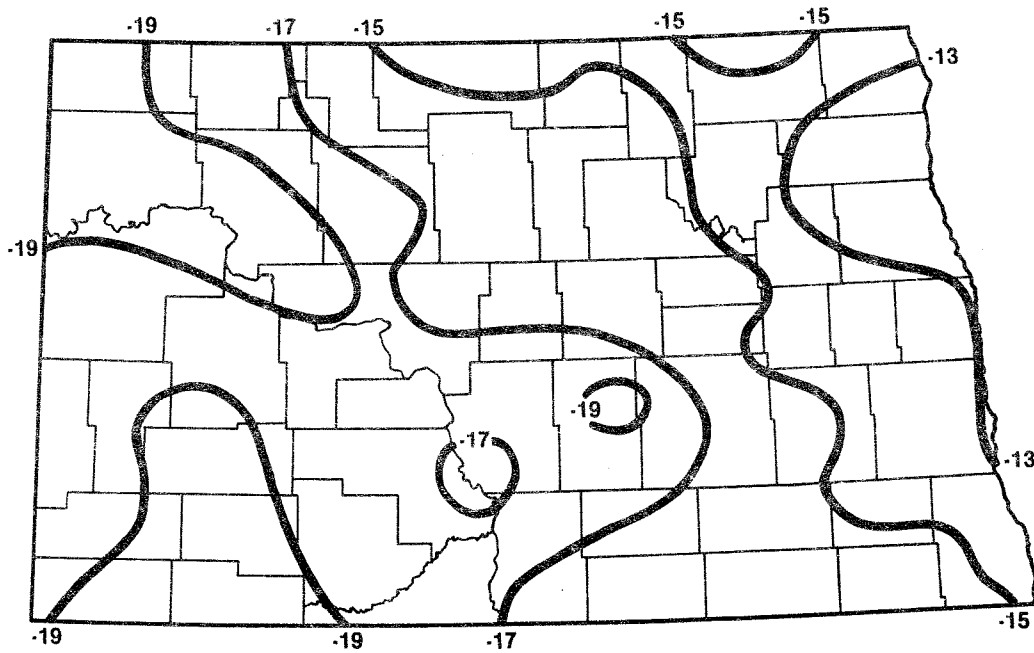
In sharp contrast January temperatures were above normal all over the state (Figure 3). Average temperatures ranged from  $4^{\circ}\text{F}$  above normal in eastern North Dakota to  $10^{\circ}\text{F}$  above in the southwest (Figure 3).

The January temperatures are an indication of snow cover conditions during the month. Since snow cover reflects most of the sun's energy there is little surface heating. In addition, when the air temperature rises to near freezing the snow begins to melt. Since most of the available energy is consumed by melting snow the air temperature seldom rises above the mid to high 30's when there is snow cover. Many days in January found temperatures in the 40's and 50's in western North Dakota while in the east they remained in the mid to high 30's.

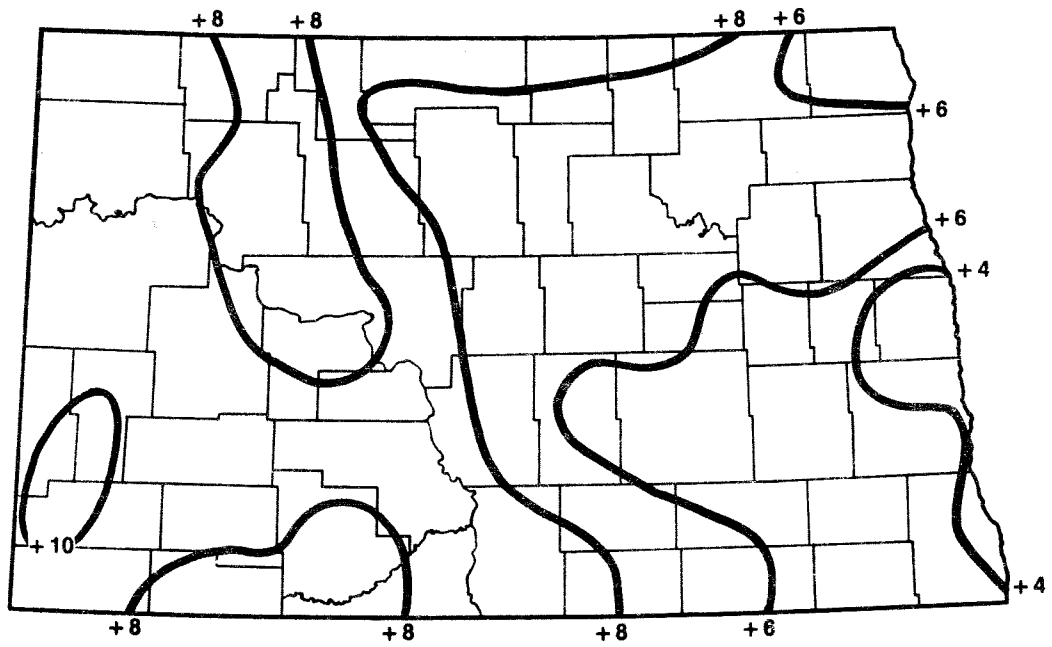
February was another extraordinary month, ranking as one of the warmest on record. Average temperatures ranged from  $22^{\circ}$  to  $32^{\circ}\text{F}$  from east to west across the state. These temperatures were  $11^{\circ}\text{F}$  above normal in the east and south and  $14$  to  $16^{\circ}\text{F}$  above in the west and north (Figure 4). It was the third warmest February at Williston, Minot, and Fargo and the second warmest in Langdon. On several days record high temperatures were tied or broken across the state.



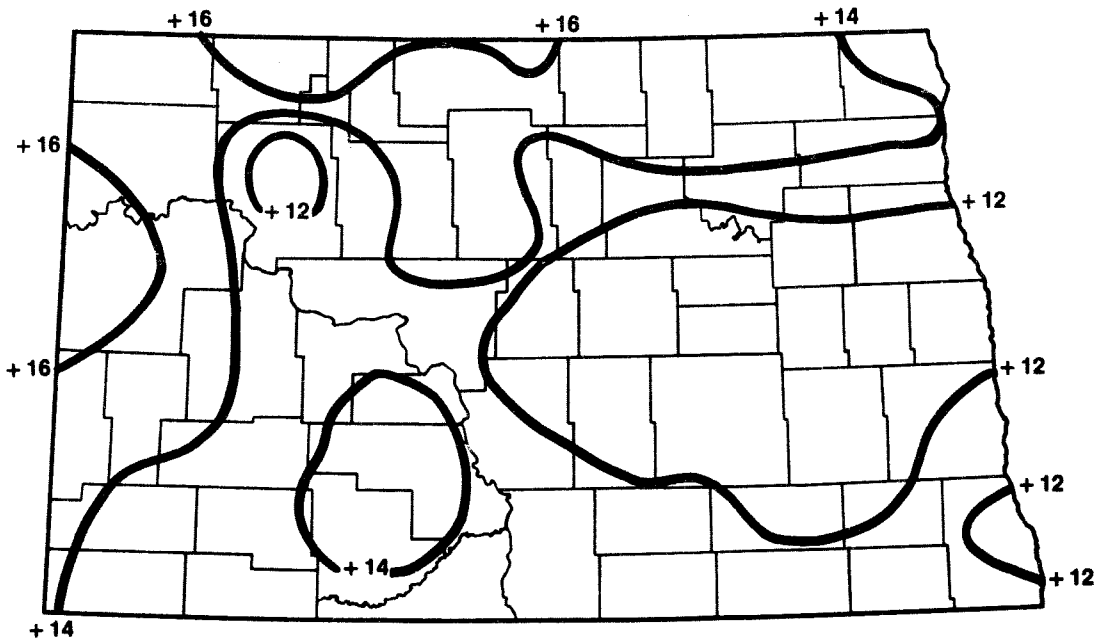
**Figure 1. Average departure from normal temperatures (°F), December 1983-February 1984.**



**Figure 2. December 1983 departure from normal temperatures (°F).**



**Figure 3. January 1984 departure from normal temperatures (°F).**



**Figure 4. February 1984 departure from normal temperatures (°F).**