

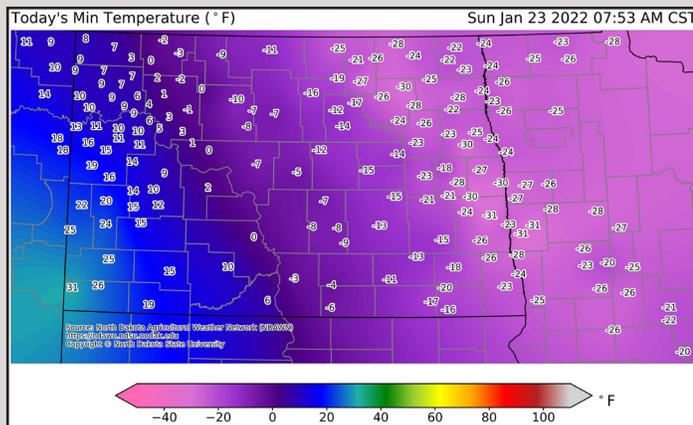


THE ATMOSPHERIC RESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

RECORDING THE FLIPSIDES OF NORTH DAKOTA'S WEATHER

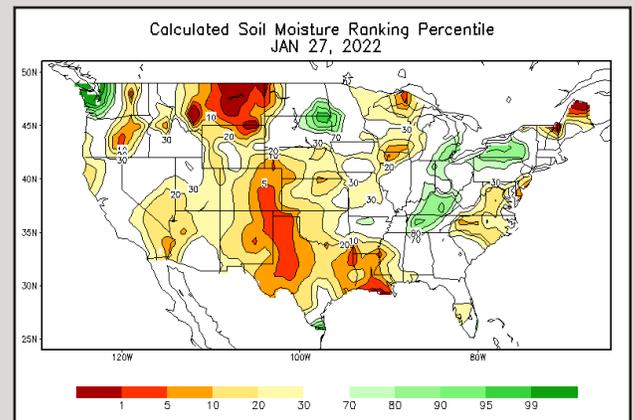
By Mark D. Schneider



North Dakotans know that weather conditions can vary significantly depending on what part of the state they're in. Would you believe that during the morning of January 23, there was a 62-degree temperature difference between the North Dakota Agricultural Weather Network (NDAWN) recording sites in Prosper (near Fargo) and Sunny Slope (near Bowman)? Daryl Ritchison, Director of NDAWN posted this occurrence, along with other fascinating weather events on Twitter. When asked about the number of NDAWN weather stations across our region (including the eastern edge of Montana and western edge of Minnesota), Daryl commented that, "There are currently 168 full stations and 4 rain gauge only sites. We are scheduled to add 6 more stations this summer (all full towers) and upgrade 16 tripod stations to towers in 2022."

So why does western North Dakota oftentimes experience warmer temperatures during the winter than eastern North Dakota? Westerly and southwesterly winds in Montana and Wyoming, originating along the mountain slopes and high plains, cause the air to compress and warm as it "sinks" in elevation approaching western North Dakota. In addition, during the winter months especially, a large gradient of temperatures called a baroclinic zone can setup across North Dakota dividing the southwestern part of our state from the

northeast. In this weather setup, the upper-level jet stream is usually oriented northwest to southeast and can remain nearly stationary for days. Cold, arctic air gets shunted into northeastern North Dakota, accompanied by a steady increase in temperatures as you move toward the southwest part of the state.



As far as precipitation is concerned, the eastern part of our state receives more average annual precipitation than the west. This is mainly due to regular storm patterns that transport more Gulf of Mexico moisture to the eastern edge of North Dakota. From last fall through this winter, storm systems have largely missed the northwest region of our state (including northeastern Montana), contributing to an increased deficit in soil moisture and drought conditions.

If you're ever curious about North Dakota's varying weather conditions and want to observe them firsthand, visit the NDAWN website at <https://ndawn.ndsu.nodak.edu>. There you will not only find temperature and precipitation measurements, but also wind speed and direction, soil temperatures, and a whole lot more!

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