

# THE ATMOSPHERIC RESERVOIR

*Examining the Atmosphere and Atmospheric Resource Management*

## Winter Season Travel

by Bruce Boe

It has been said that there are two seasons in North Dakota; winter season and road construction season.

This reflects the reality that most of us spend a significant fraction of our year having to deal with snow.

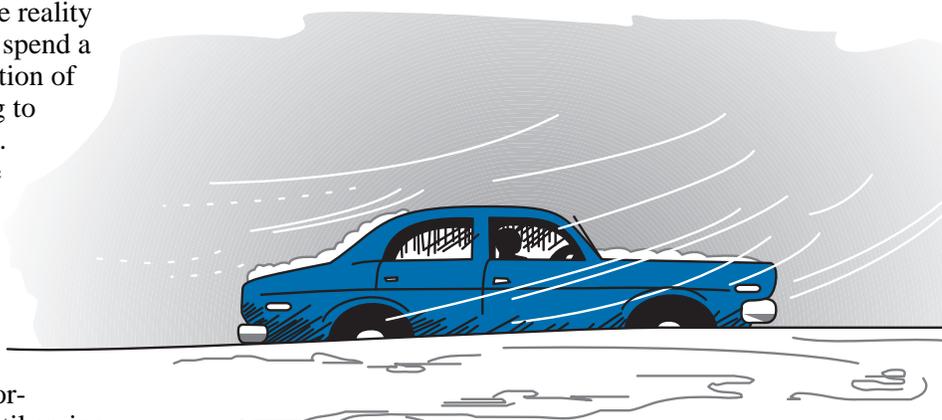
Most years, the state is blanketed with whiteness by the end of November; a blanket that

remains more-or-less in place until spring—perhaps late April.

All this exposure to snow has given us a wealth of experience in dealing with it. Yet, in spite of our experience, for most the task is not a pleasant one. Why is travel often so difficult?

First, let's consider snowfall in the absence of significant wind. If the temperature is much colder than 32°F, the snow remains "dry", and is largely blown clear of well-traveled roadways by the traffic. On less-traveled roads, the snow may be quickly packed. Though snowpack is initially just a hard, white layer of snow, with time and traffic it becomes ice. On multi-lane roads such as the interstate highways, the driving (right) lane often is blown clear by the traffic, while accumulations quickly develop in the passing lane. This often creates a serious hazard, as passing vehicles may place the slower vehicles they pass in a snow fog-induced white out. The

longer it takes for the pass to be completed, the greater the chance that the slower vehicle will end up being driven into the ditch.



When the winds blow, circumstances change dramatically. Initially, wind may not be a problem. If snowfall is light or intermittent, and when there is not significant newly-fallen snow to be raised by the wind, a breeze may actually help, blowing the new snow clear of the roads. In such conditions, travel may be affected very little.

If the road surface has been warmed to temperatures around freezing, windblown snow traversing the roadway will likely begin to stick to it. Initially, melting occurs, but in time, a slushy or icy surface develops beneath the path of the snow. In these circumstances, it is possible to develop icy roads when snow is not falling and when the sun is shining!

When significant snow falls and the winds blow, the result is usually widespread snow accumulations, including drifting, significantly reduced visibilities, and dangerous windchill temperatures. Under these

conditions, travel without a winter survival kit in your vehicle is not recommended.

Once in awhile, roads can become dangerously icy in the absence of wind or precipitation in any form. This is possible whenever the air has been very cold (well below 0°F) for a protracted period of time, only to have a significantly warmer, moister air mass move in. When

this happens, frost quickly develops on exposed roadways, and will likely persist until the road surface itself has warmed significantly. Because frost cover usually develops as a result of moderating temperatures, motorists may be surprised to encounter slippery highways during otherwise fair conditions.

Finally, icy roads may result from episodes of freezing rain or freezing drizzle (see the *Atmospheric Reservoir*, December 1996).

It would seem that nature has no shortage of ways to make a road icy. As you plan your winter travel, keep this in mind, and allow extra time to reach your destination. ■

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