



# THE ATMOSPHERIC RESERVOIR

*Examining the Atmosphere and Atmospheric Resource Management*

## *"Mother Nature's Helping Hand in the 2013 Flood Season"*

By Mark D. Schneider

If weather conditions had been "normal" for North Dakota this spring, then widespread, record flooding would've been a reality for many communities. April brought well-below normal temperatures statewide. In fact, all major reporting stations including Bismarck, Dickinson, Fargo, Grand Forks, Jamestown, Minot, and Williston had a top five coldest April on record. Fargo set a new record for latest 50-degree day in any year on April 26th and tied the latest 60-degree day record.

The snow pack leading into the late April/early May melt had emergency planners concerned and for good reason. Snow Water Equivalent (SWE) values were reminiscent of spring 2011 and with the prolonged start to the melt the potential for rapidly warming temperatures became an underlying reality. To put things into further perspective, Fargo's normal high temperatures for late April are in the low 60s. If the stretch of 60-degree weather that Fargo experienced at the tail end of April had continued through early May, it would've set a rapid melt into motion and potentially been one of the five worst flood crests in Fargo's history. Instead, overnight low



temperatures cooled off into the 30s and by May 1st a return to 40 and 50-degree weather was seen.

Another benefit to the temperatures this spring is their undoubted contribution to soil infiltration. The ground warmed up just enough to allow a significant amount of snowmelt to infiltrate, whereas it otherwise would've simply contributed to a widespread overland flooding scenario if the frost had remained in place.

In comparison to the conditions that brought flooding to the Missouri and Souris River Basins in 2011, we were fortunate that there weren't any significant spring rains to rapidly accelerate the snowmelt and bolster the amount of water passing through these systems this season. Two weeks after many rivers across the state were finally reaching their early May crests, record setting May

rainfall events began across western and central North Dakota and lasted through early June. Had these seven to ten inch cumulative rains coincided with the snowmelt in late April or early May, flood conditions would've been significantly worse.

The Red River at Fargo crested at 33.3 feet on May 1st, making this the 12th highest on record. This was very significant because the forecast was for a potential crest of 38 to 42 feet. When flood forecasts are made, meteorologists, hydrologists, and field technicians have to use a combination of climatological data, weather forecast models, and recent snow pack measurements from ground observers and aircraft flyovers to predict the most probable and conservative outcomes. It is always better to err on the side of caution in this instance. When much better than expected outcomes occur such as this season, the end result is a minor expenditure of cost and resources in comparison to the potential loss and damage of a significant flood event.

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