

# THE ATMOSPHERIC RESERVOIR

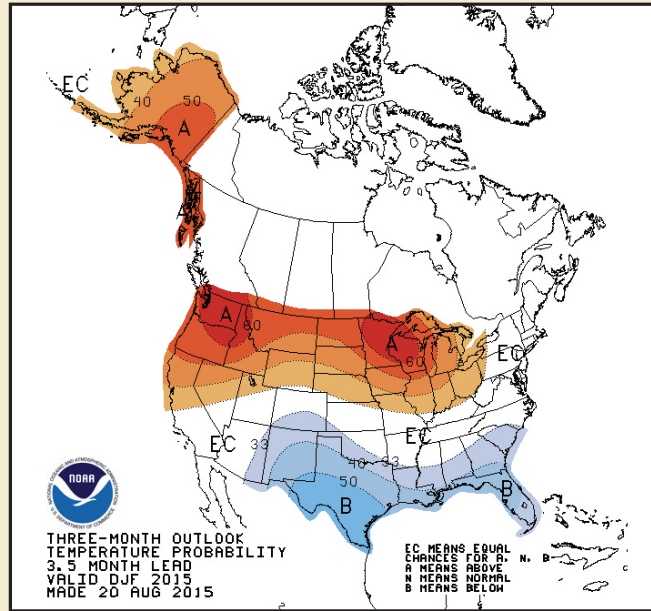
*Examining the Atmosphere and Atmospheric Resource Management*

## "The Return of El Nino"

By Mark D. Schneider

The recent development of El Nino has been featured in the news and it's important for North Dakotans to understand the effect that it could have on our weather. Let's first review what El Nino is: *A significant increase in sea surface temperature over the eastern and central equatorial Pacific that occurs at irregular intervals, generally ranging between two and seven years (AMS Glossary).* In Spanish, El Nino means "the (boy) child" and its name originated when fishermen in northern Peru began to notice a warm coastal current that developed close to Christmas and began referring to it as "the Christ Child." The warmer waters in the eastern Pacific can have a marked effect on strengthening the subtropical jet stream and pushing the polar jet stream northward. The two jet streams can remain in a "split" pattern for much of the winter season, resulting in milder temperatures and less snowfall for the northern tier of the U.S. The graphic shows the Climate Prediction Center's three-month temperature outlook for this December through February. Notice North Dakota's above average chance for warmer temperatures during this period.

Looking back at previous El Nino events such as the strong



episode during the 1997-98 winter season, we see evidence of its effects: Bismarck reached a record high temperature of 56 degrees on January 1, 1998! You may be wondering why North Dakota didn't experience a mild winter during the last El Nino in 2009-10. To simplify this explanation, just imagine El Nino being one of many global weather and climate cycles. When an El Nino is occurring, other oceanic cycles such as the Pacific Decadal Oscillation (PDO) are coinciding with it to either strengthen or weaken its signal. In 2009-10 the PDO was in a negative phase and worked to help cancel out El Nino's effects. Since July 2014 the PDO has been in a positive phase, which may enhance the effects of El Nino for the upcoming winter.

Although scientists have only closely studied El Nino during

the last century, there is evidence that it has been occurring for thousands of years. The detailed sea surface temperature measurements that are now being recorded to research phenomena like El Nino provide important clues as to how our oceans and climate are changing.

North Dakotans will likely be in store for a milder than normal winter and reap some of El Nino's warming benefits. On average, North Dakota is two degrees warmer during El Nino winters. This may not seem significant, but averaged over the winter season it means that we typically receive fewer cold air outbreaks. There is greater variability when looking at its effects on snowfall. On average, North Dakota receives three to six inches less snowfall during El Nino winters. Because snowfall is so variable across our state anyway, the differences during an El Nino winter are sometimes unnoticeable. So keep your winter coats and shovels handy this winter, even though you might not need them quite as often.

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