Winter 2012-2013 Forecast for Southwest Lower Michigan

By William Marino

The temperature forecast for Southwest Lower Michigan for the winter of 2012-2013 (Figure 1) calls for equal chances (33%) of above, near or below normal temperatures. The precipitation forecast (Figure 2) calls for equal chances (33%) of above, near or below normal precipitation. The snowfall forecast is also for equal chances (33%) of above, near or below normal snowfall.

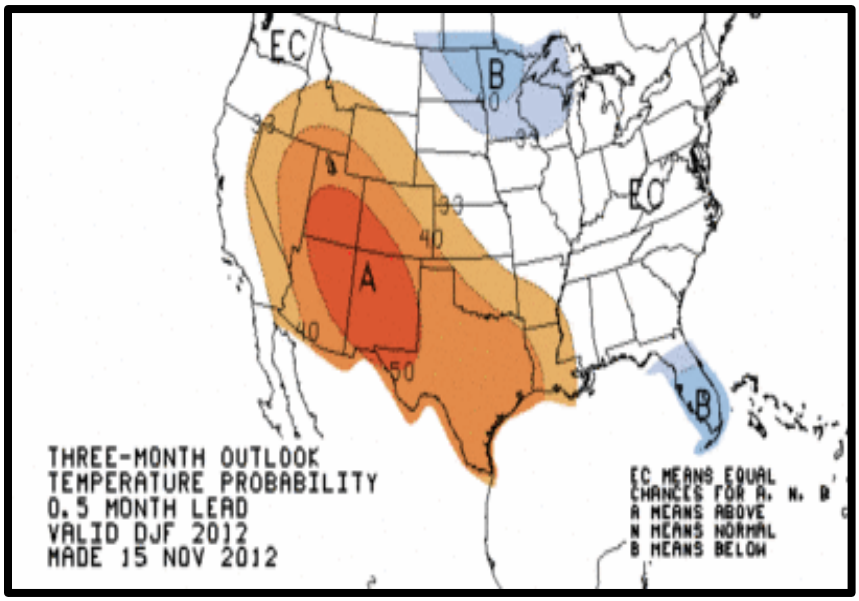

Figure 1. CPC three month outlooks for temperature probabilities.

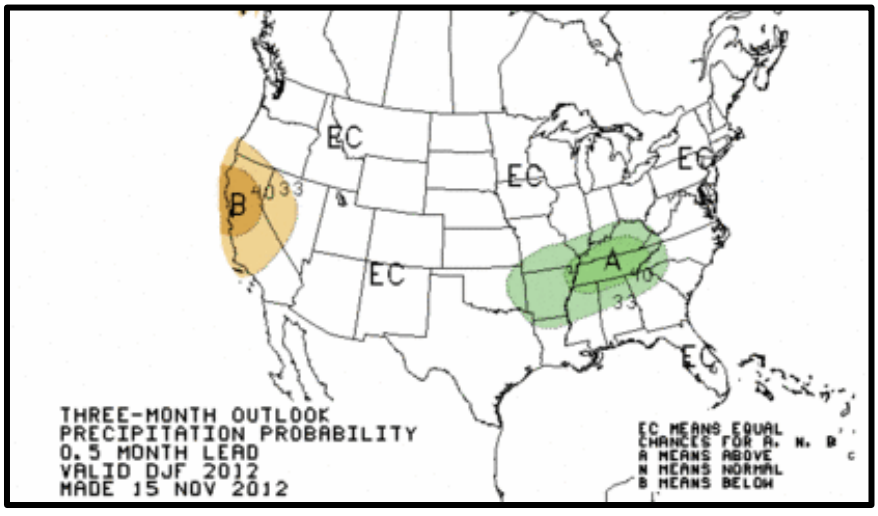

Figure 2. CPC three month outlooks for precipitation probabilities.

This forecast is based on the forecast for ENSO (El Niño Southern Oscillation) to be in the neutral phase. This means conditions are expected to be near normal with neither an El Niño nor La Niña expected. Numerous dynamical and statistical computer models were considered. Also, the trend in the winter temperatures (figure not shown) was considered. The past 10 winters in Southwest Lower Michigan were near neutral (neither warming nor cooling had occurred).

Below (Figure 3) is a typical set up for the position of the polar jet stream during 14 cases between 1961 and 2000 when ENSO was neutral. With the polar jet stream in the position shown in the diagram, it can be seen that Southwest Michigan would be on the edge of both polar and temperate air streams, which originates from the eastern Pacific. As a result, I would expect cold and warm spells to be more extreme than we have had during the past two winters. The upcoming winter will be more like the winters of 2004/2005 and 2008/2009. During those periods, we experienced about two weeks of warmer than normal temperatures followed by two weeks of colder than normal conditions. In both winters the total number of above normal days was about equal to the total number of below normal days. It will be unlike the last two winters. During the winter of 2011/2012 temperatures were mostly above normal. During the winter of 2010/2011 the daily temperatures were mostly near to below normal.

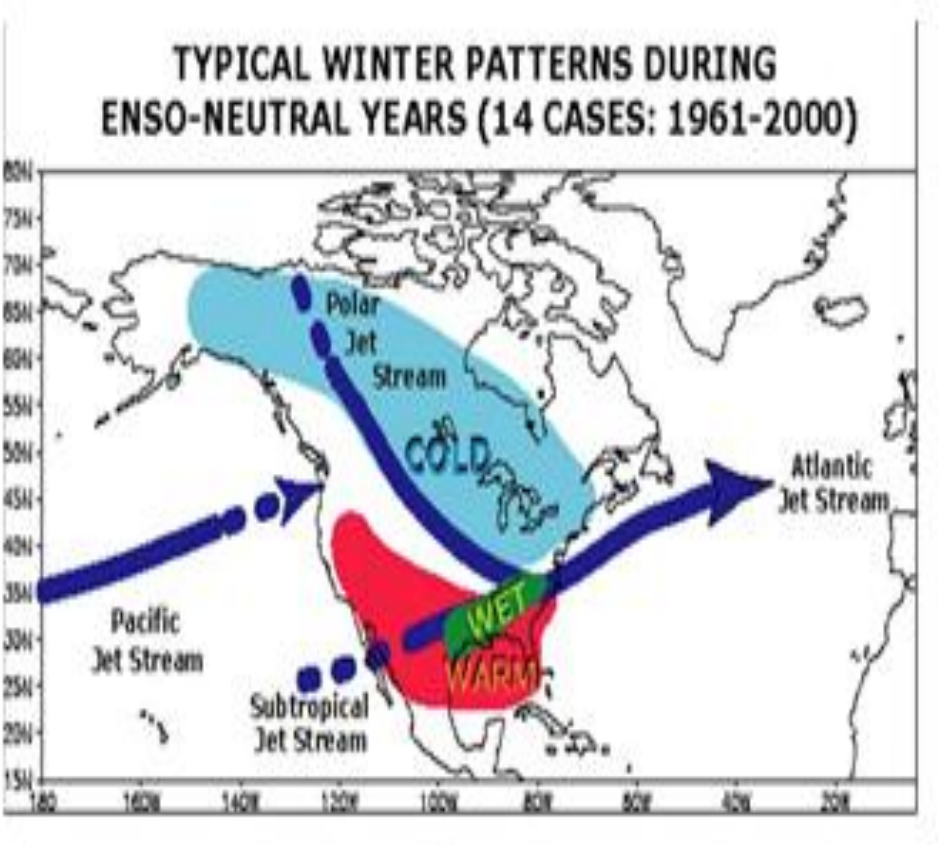

Figure 3. The diagram above is the Climate Prediction Center's depiction of the typical winter weather pattern during ENSO neutral years. The blue arrows are the positions of the typical jet streams that impact the United States during the winter months during ENSO neutral years.

For the majority of ENSO neutral winters (Figure 4) the typical outcome entails colder than normal temperatures over the northern plains into the western Great Lakes, while slightly above normal temperatures typically occur over the southeastern United States. If composite temperature anomaly maps are compared below to the CPC temperature anomaly forecast for this coming winter, you may note they are rather similar. Both show colder than normal temperatures over the northern plains. Southwest Michigan is on the edge of the "cold anomaly" with the composite forecast.

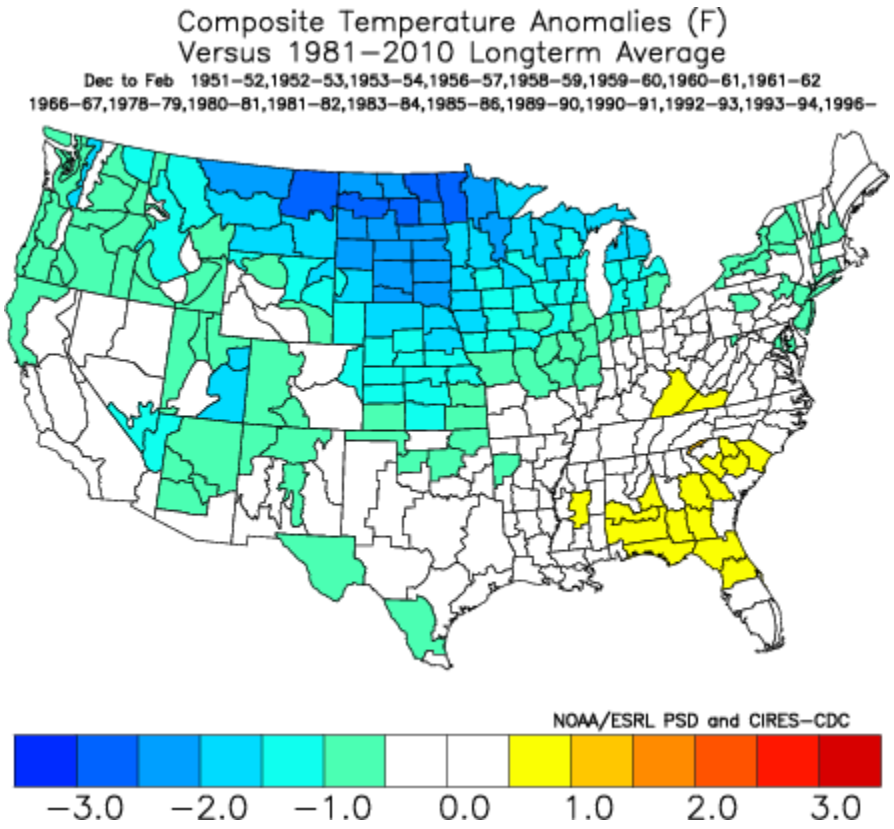

Figure 4. The composited temperature for all ENSO neutral winters, using the 1981 to 2010 normal as a basis for the temperature anomaly.

The precipitation anomaly (Figure 5) for all ENSO neutral winters from 1950 through 2010 , show near normal precipitation across most of the Great Lakes. Note, the above normal precipitation area over the southeastern United States looks very similar to the official CPC forecast.

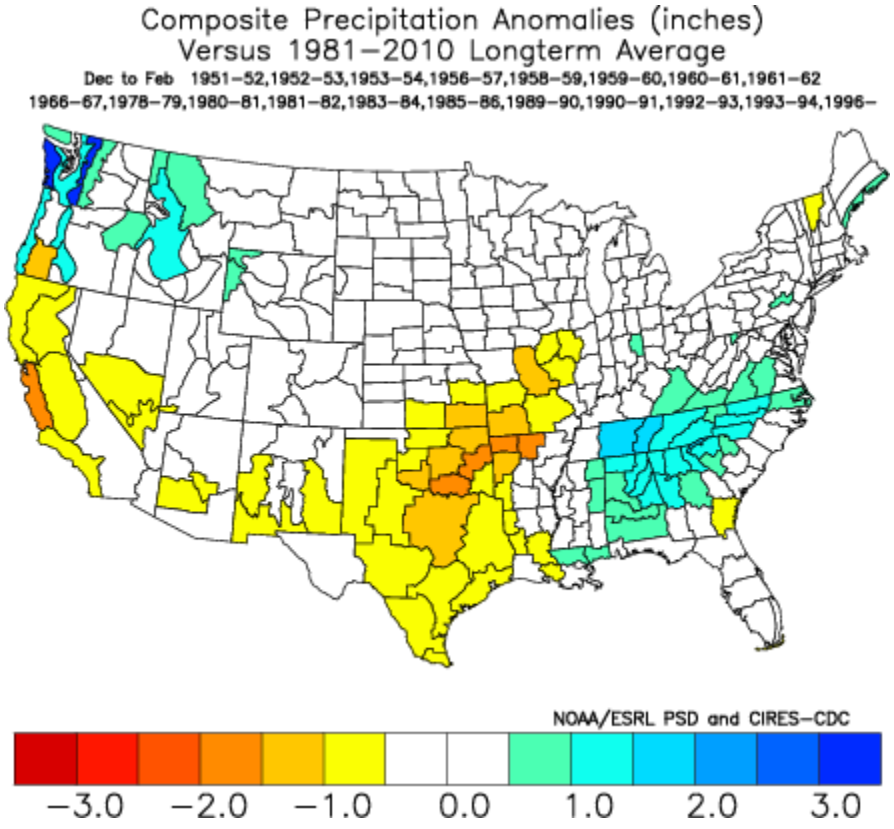

Figure 5. The composited precipitation for all ENSO neutral winters, using the 1981 to 2010 normal as a basis for the precipitation anomaly.

The snowfall composite from 1948 through 2006 for November through March (Figure 4) shows near normal snowfall when all 38 ENSO neutral winters are averaged together (Figure 4). The average departure from normal for snowfall during all ENSO neutral years in Grand Rapids is +6.2 inches. At Muskegon it is 3.3" and at Lansing it is 0.0". All statistics are within range that is considered normal.

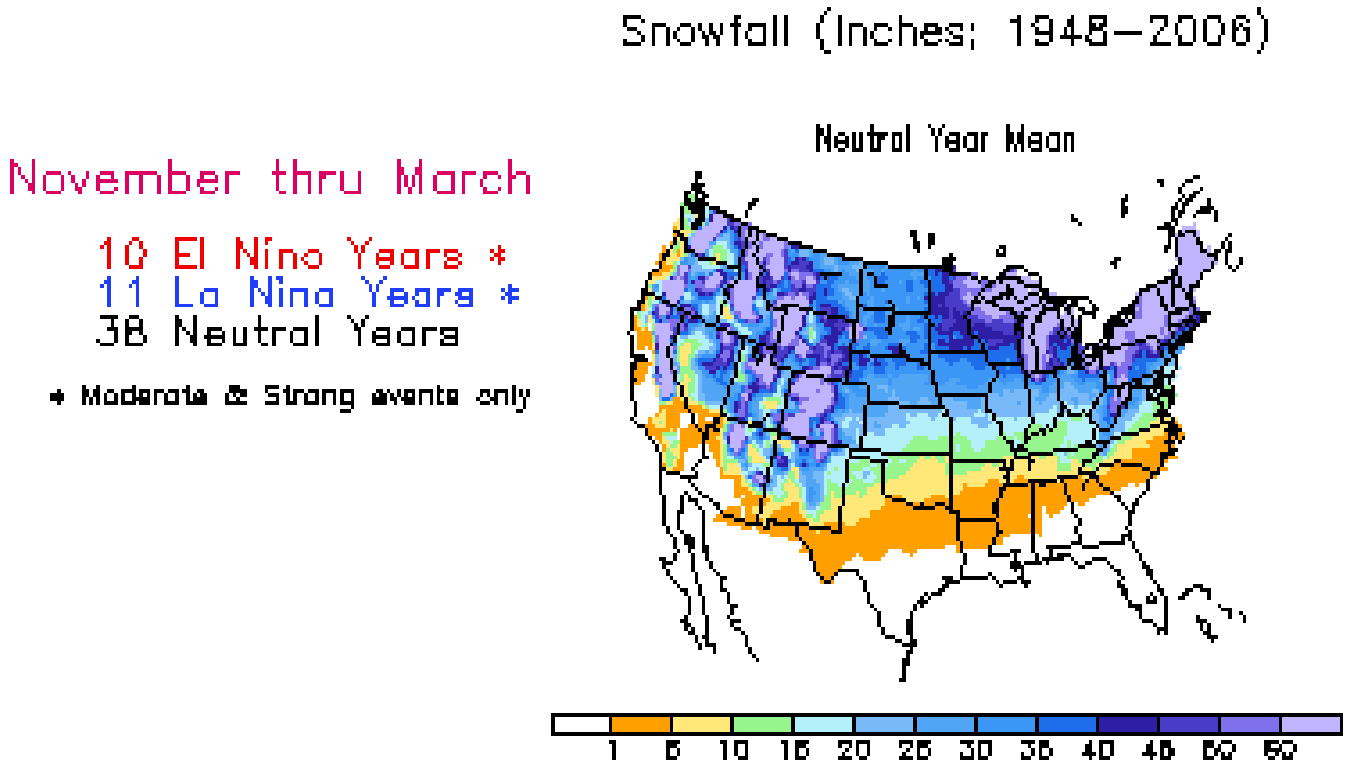

Figure 4. The ENSO neutral snowfall composite (near normal)

Below are some links to key web sites related to this forecast:

The Climate Prediction Center Long Range 3 Month Forecasts

The Climate Predication Center's Discussion for the Long Range Forecast

The Probability of Temperature Exceeding Normal for the Winter Forecast

CPC Climate Briefing Page

(see # 31 for ENSO forecast, # 32 for composite forecasts, #42 Drought blend tools)

Climate Monitoring and Weather Monitoring

(AO index, PNA index, NAO index, ENSO tracking, Madden-Julian tracking, Storm Tracks)