

With a Change in the Month/Season, Comes a Change in the Weather Pattern (A look back at autumn and a look forward into early winter)

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December 1st, 2009

Our Autumn 2009 weather pattern over the country brought primarily a mild, pleasant and dry fall. It wasn't all nice by any means as our mild fall contained one cold miserable heart, coming during the first half of October. Also, our weather this fall was jumbled up as far as the typical trend seen with one month's weather better suited for another's. September's weather was the most pleasant relative to normal (with November's coming in a close second). September's weather contained above normal temperatures, considerable sunshine and below normal rainfall. In fact, September's weather represented summer's typical weather (albeit, a few degrees shy of the normal) better than some of our actual [summer weather](#) did.

With the change in month, came the abrupt temporary change in autumn's overall pattern. A strong amplified upper air pattern brought pre-season Polar cold resulting in temperatures hovering in [record cold territory](#) during the first half of the October. Most areas saw a killing frost/freeze by the second weekend of October (roughly a week ahead of schedule, depending on location) but interestingly (especially considering the strength of the cold) none of the three official climate sights reported snow in October. Temperatures moderated impressively during the remainder of the month, so much so, that departures only averaged 2 ½ degrees below normal (a far cry from 6 ½ below just two weeks earlier).

As it turned out, October's weather was much better suited for November than it was for October. October's late temperature moderation was the start of bigger and better things as November played out with mainly unseasonably mild and rather dry (not unlike the overall fall) weather. All areas saw temperatures average close to 5 degrees above normal with only the first week containing weakly below normal departures. The mild Indian summer weather (at times) came at the classic time period for the phenomenon, mid-late fall. There were no November gales this November, a November that was also unusually nice with a-typical light winds (averaging around 7 ½ mph against the normal of near 11 ½ mph) and lacking snow. There have been only 17 years at Detroit where no snow was recorded in neither October nor November since 1880. This lack of no snow through November in Detroit happens once in about every 13 years (both Flint and Saginaw had a trace of snow in November). Here at the NWS at White Lake, a trace of snow was recorded on both the 27th and 30th. Since official observations have been taken here /1995-96 season/ there has been only one other time so little snow was observed this late and that was 2001 when also just a trace fell. In addition, back in 1998, a bit more snow fell than in 2001 in November with 0.1" while in 1999, we had just 0.4" of snow but a trace also fell in October.

Our analogues for the fall held up well for the first two months with a warmer than normal start in September and colder than normal October including the earlier than normal frosts/freezes (important for the farmers, nurseries and gardeners alike) projecting. Unfortunately, our unseasonably mild November (pleasant as it was) through a monkey wrench into projected autumn [trend](#) (seen in the analogues). The Indian Summer periods expected did materialize but lasted longer. Still, all in all, a near normal temperature call (within a degree or two of the norm value) did verify for the high side of the normal range with a +1.5 departure for the entire area and not warm enough to place in the top 20 warmest fall list. We've had some warm or mild falls in these parts recently with 2001, 2004, 2005 and 2007 showing up in our top 20 warmest falls list at various locations.

From the [Autumn Outlook](#);

Actually, inspecting the individual months closer, shows more typical fairly nice early autumn weather with around normal temperature (but with the risk of earlier frosts/freezes). Actually, a decent amount of Septembers /5/ show above normal temperatures. Later, the preference turns toward normal to below normal mid or late autumn. On the whole, however, the Autumn looks to be around normal temperatures-wise.

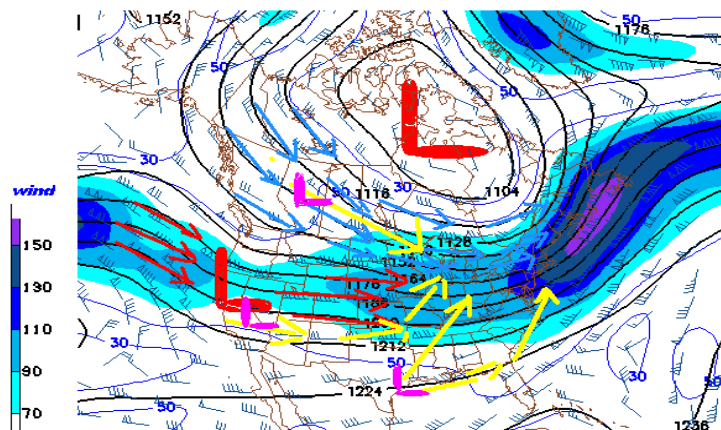
Analogues showed variable trends in the precipitation outlook (and weren't much help) with drier the normal conditions dominating across the Saginaw Valley and Thumb Region into the Flint area but wetter than normal conditions across extreme Southeast Michigan around metro Detroit into Ann Arbor south to the Ohio border. Near normal rainfall was settled on for the Outlook but the drier than normal weather found in the north ended up verifying across the entire region. Flint was the only city to place in the driest fall list at 13th place.

After a very mild November, Colder and Stormy pattern setting up for December

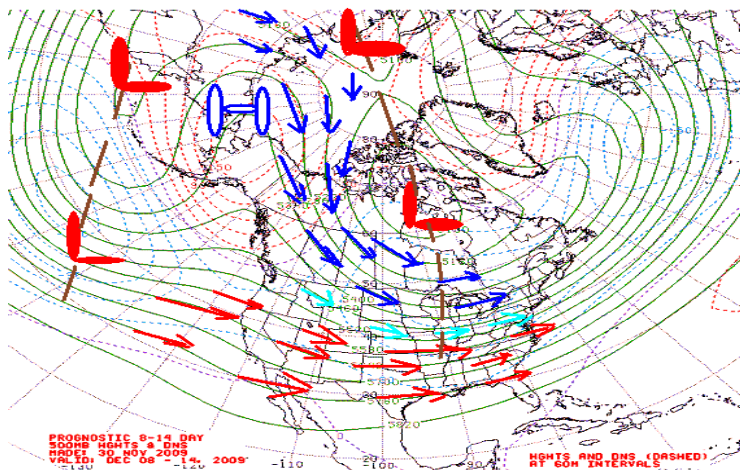
Our longer range models are showing big changes for December as the two key players discussed in our Winter Outlook begin to rev-up. Reviewing some excerpts from the [Outlook](#);

There are definitely a few wild cards in this season's outlook and just how strong El Nino becomes is one of the most important features of the winter along with its interaction with the Eastern Pacific /EPO/ and North Atlantic Oscillation /NAO/will be the telling tale for this winter. The other important wild card this winter is of course, the trend of the North Atlantic Oscillation/Arctic Oscillation throughout the winter. Many of our analogue winters start out on the mild side but deteriorate during the winter.

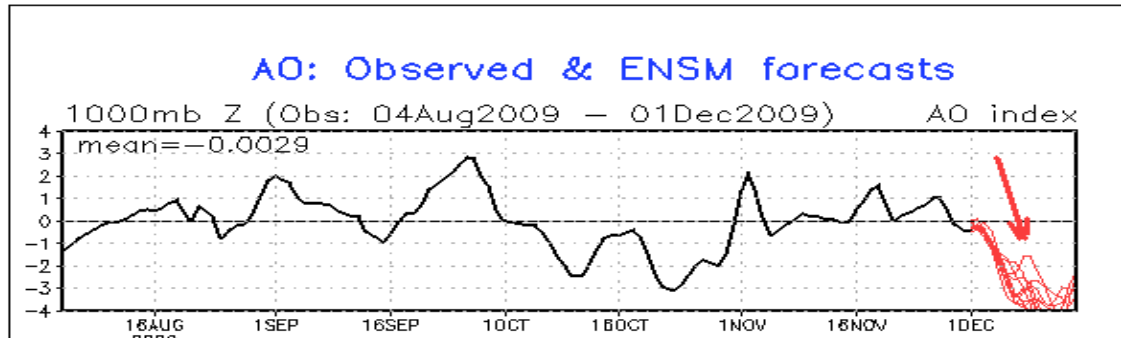
In the Outlook, I choose a random projected 200 MB pattern in which I thought gave the best example (and simplicity) regarding these key players along with likely main storm tracks for the winter (see below).



This pattern has been evolving on the extended models (below) for a shorter, snap-shot period of time. Check out this recent extended 500 MB patterns issued for early - mid December (8-14 day projection).



Clearly the two patterns affecting the US (subtropical jet aided by El Nino and increasingly negative North Atlantic Oscillation /NOA-/) will fight for control of the weather pattern the next few weeks which may last the entire season rather than one or the other dominating (hence the title of my Outlook, [“Interesting Winter Setting Up?”](#)) Looking at the projection of the Arctic Oscillation (/AO/ a portion, or subset of NAO) into the next few weeks (graph below) shows the dive into negative territory. Note, however the strength of the drop is quite dramatic and the computer members are looking quite a ways out as to how negative the Arctic Oscillation will become. Our actual drop in the Arctic Oscillation for October is on this graph when temperatures plummeted the first couple of weeks of the month. How much Arctic cold air will ultimately make it down to our neck of the woods will depend on the jet stream pattern at the time it settles over Canada.



It was found that there was a notable mild period before “winter weather” actually set in with many of these early winter and December periods (see excerpt below from Winter Outlook).

The most notable trend found was the milder Decembers or in the early winter period. Eight out of the 12 Decembers at Detroit averaged above the December normal of 29.6 (so, two-thirds or 67% of the time). After December, results became more variable in January and February but with trend toward colder weather (or more typical winter weather). This is what you would expect if the El Nino does weaken (which is expected) mid to late winter. These winters also show some impressive cold shots (periods) which offset the milder weather experienced. As always, while these trends may evolve, the timing may present a problem. The last few winters this hasn't been the case but in this set of winters, when dealing with both El Nino timing and NAO timing, the predictability is simply, more challenging.

In the Outlook, timing was mentioned (above) as being the biggest obstacle to this season's outlook and this may very well be the case, now. It is possible that our expected mild period for early winter may have been November rather than December (though the aforementioned upper air pattern battle may be echoed by fluctuating temperatures much of the season). As of late November, El Nino was slated to peak within a month or two, somewhat earlier (with shorter cycle) than many El Ninos in the study. It was found that when the El Ninos peaked earlier, the winters were more variable across Southeast Lower Michigan and were somewhat colder (but then again, the influence of the NAO/AO during the winter can't be stressed enough). We had a very pronounced mild period late this fall lasting over a month which led to one of warmest Novembers in history. If our expected pattern is indeed, ahead of schedule, then the milder than normal December found in 67% of the cases is in jeopardy especially if the aggressive negative NAO/AO pattern projected the first half of the month maintains itself. The weather found the remainder of the winter periods (January through April, when looking at both temperature and snow) was much more variable and we may very well already be entering into that pattern. On account of this, I feel temperatures for the December period should be adjusted down closer to normal (and below normal for the first half of the month, anyway).

So, hang on to the roller coaster we're in for a bumpy ride!