

Incredible Stormy Winter Continues But Temperatures & Precipitation are In Spring 2008: Busy Storm Track Expected to Persist Into Spring

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March 5th, 2008

With storm after storm pushing northeast into the southern Great Lakes this winter, a surplus of snow and rain was seen and continues as of early March. Temperatures fluctuated energetically up and down throughout the winter. While the snow tally for the winter will end with the last snowflake, temperatures and rainfall (but not snowfall) for the 'Winter of 2007-08' are in. When all was said and done (and partly because of the wide fluctuations), the Winter of 2007-08 will go down statistically as just slightly above normal temperature-wise, and well above normal for both rain and snow.

Using the three main locations (Detroit, Flint and Saginaw) the average temperature for Southeast Lower Michigan averaged at 26.0 degrees, or a degree /+1.0/ above normal. And strictly speaking, a degree above normal is still comfortably within the "normal" or average range. In the Winter Outlook, temperatures were forecast to swing above and below frequently and sometime widely but in the end, average between 1.0 degree below normal and 1.5 degrees above. If the NWS site is also added to represent the northern suburbs of Detroit, the average falls to 25.6, or about a half degree /+0.6/ above the normal of 25.0 degrees (see bottom of chart, lower right).

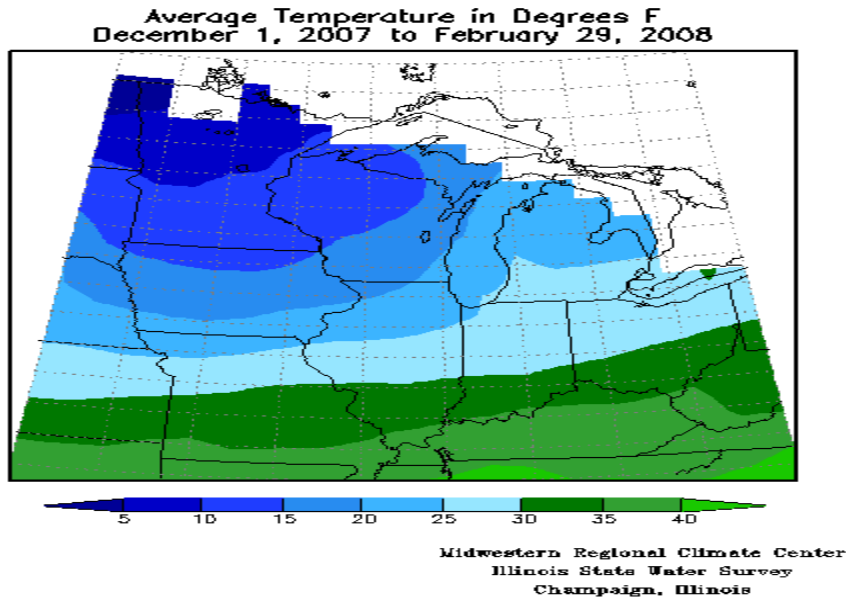
SOUTHEAST LOWER MICHIGAN

WINTER 2007-08 TEMPERATURES

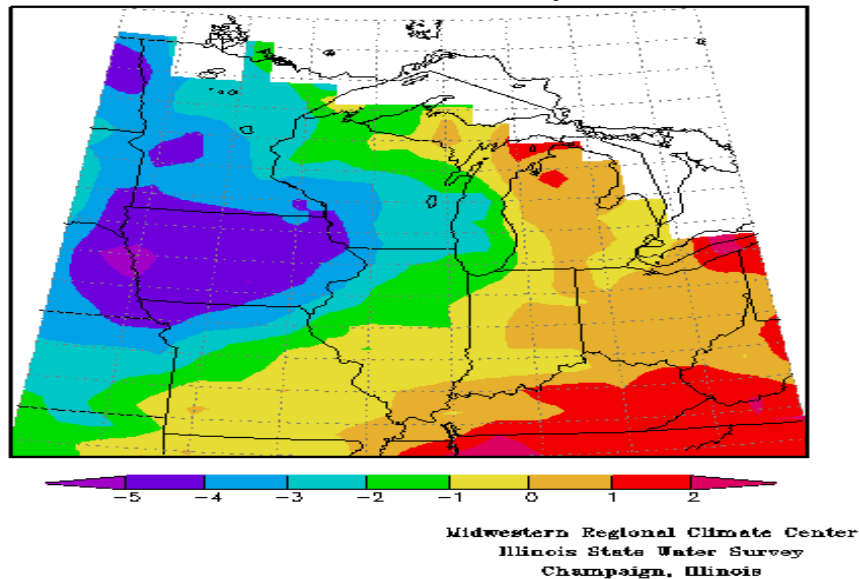
SITE	DEC	JAN	FEB	WINTER TEMP	
				AVE	DEP
DETROIT	29.6	28.9	25.2	27.9	+0.8
FLINT	27.6	26.9	23.4	25.9	+2.0
SAGINAW	26.1	26.1	20.8	24.3	+0.2
NWS WHITE LAKE	25.9	25.9	20.6	24.1	
DEPART FROM NORM	N	A	B	25.0/26.0	+1.0
				25.0/25.6	+0.6

Actual 2007-08 winter maps

Below are the actual temperature maps along with departures from the [Midwest Climate Center](#) for the winter /Dec-Feb/. In these maps, all the Southeast Lower Michigan sites are used and averaged and thus, the temp averages and departures may be slightly different (in this case, near normal temperatures rather than above).



Average Temperature Departure from Mean in Degrees F
December 1, 2007 to February 29, 2008



Below are the actual precipitation tables for the stations in Southeast Lower Michigan, including NWS White Lake /Dec-Feb/.

WINTER 2007-08 PRECIPITATION

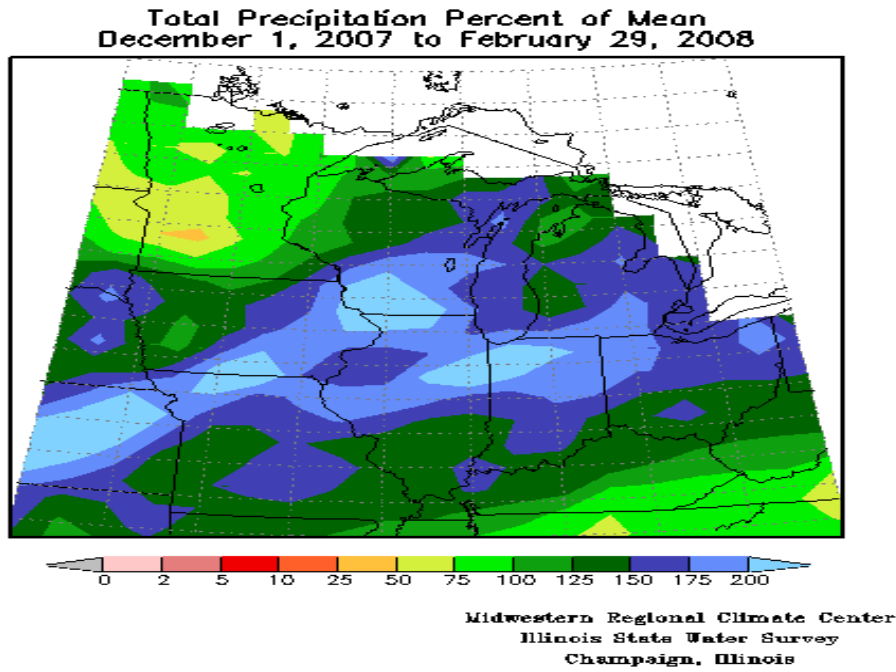
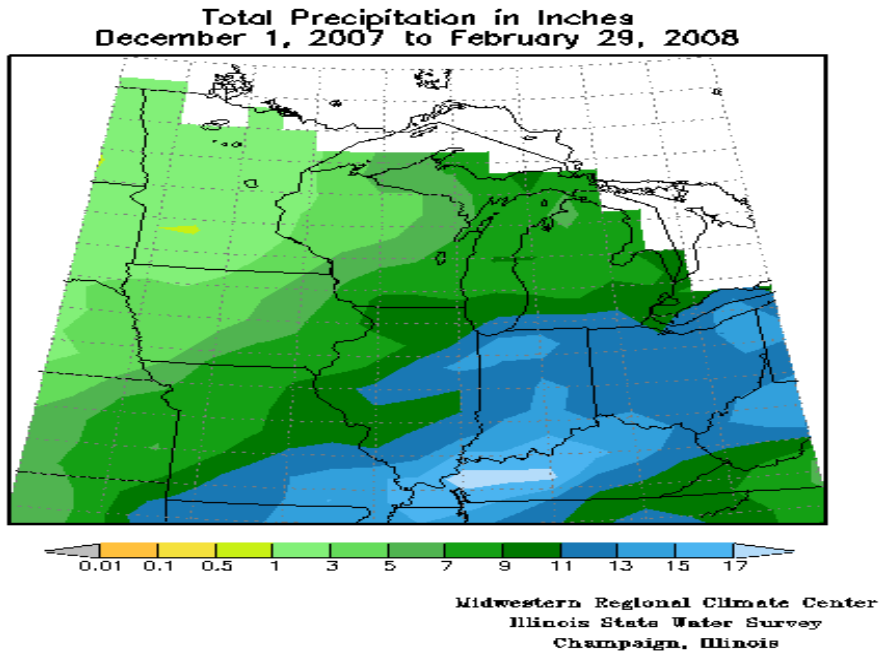
SITE	DEC	JAN	FEB	WINTER TOTAL PRECIP/DEPART
DETROIT	3.48	2.13	3.61	9.22 / +2.92
FLINT	2.43	2.49	2.35	7.27 / +2.17
SAGINAW	2.09	2.02	3.13	7.24 / +1.79
NWS WHITE LK	2.66	4.18	3.74	10.58
DEPART FROM NORM	A	A	A	A

S N O - O H!

WINTER 2007-08 SNOWFALL THUS FAR (3/1/08)

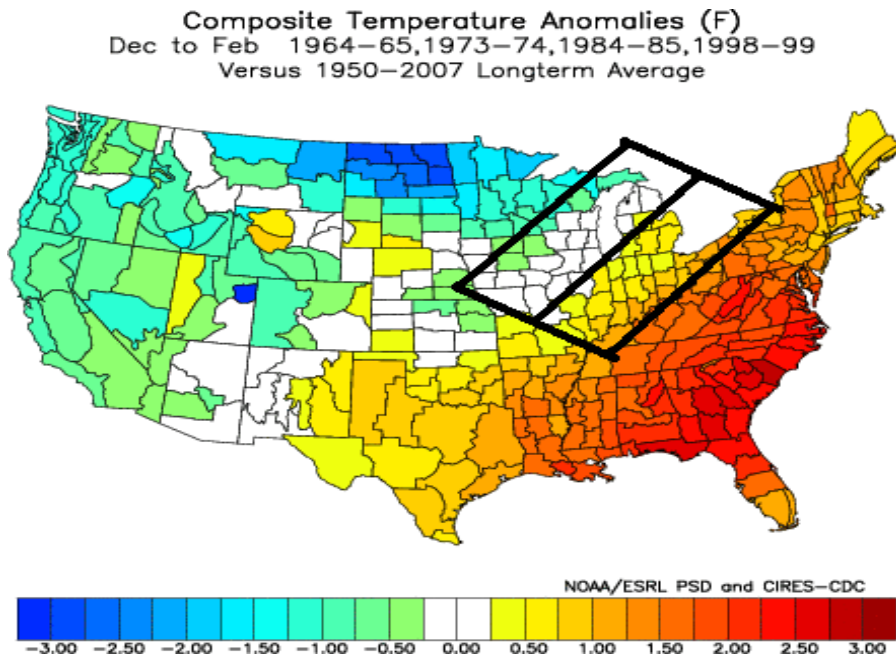
SITE	OCT	NOV	DEC	JAN	FEB	MAR	APR	SEASON/DEP	LAST ENTIRE SEASON
DETROIT	0.0	0.5	12.2	13.8	24.2			50.7/+15.4	30.3
FLINT	0.0	5.7	17.1	22.8	29.4			75.0/+37.0	41.0
SAGINAW	0.0	2.8	22.6	18.9	34.2			78.5/+34.3	29.1
NWS - WHITELK	0.0	6.5	16.4	27.4	28.6			78.9	46.6
	B	N	A	A	A			A	B

Below are the precipitation maps along with percent of normal from the [Midwest Climate Center](#) for the winter /Dec-Feb/.

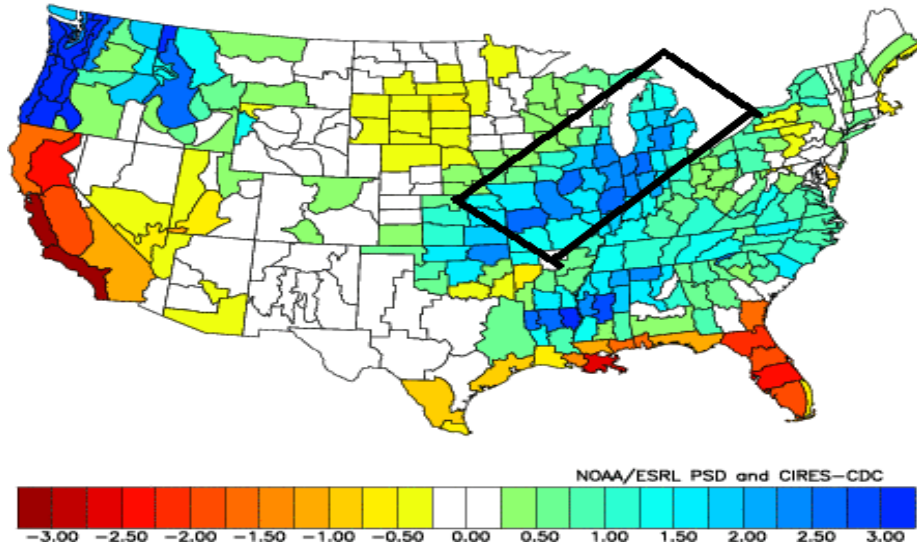


THE BEST ANALOGUE WINTERS FOR TEMPERATURES /PRECIPITATION TRENDS

The following are the composite temperatures and precipitation anomalies from the analogue winters in the original Winter Outlook that most resemble the temperatures and/or snow for the current winter. Note the northeast to southeast "dividing area" that shows up nicely in the temperatures, normal (white) to slightly above normal (yellow) over the Great Lakes and Ohio Valley. The second map relays the precipitation trends (resulting from the storm tracks across the same region). Temperature departures, like this past winter, on average hovered around normal to slightly above. Check out the averaged precipitation departures in these winters and like this past winter, averaged about 2.0"–3.0" above normal.



Composite Precipitation Anomalies (inches)
 Dec to Feb 1964–65, 1973–74, 1984–85, 1998–99
 Versus 1950–2007 Longterm Average

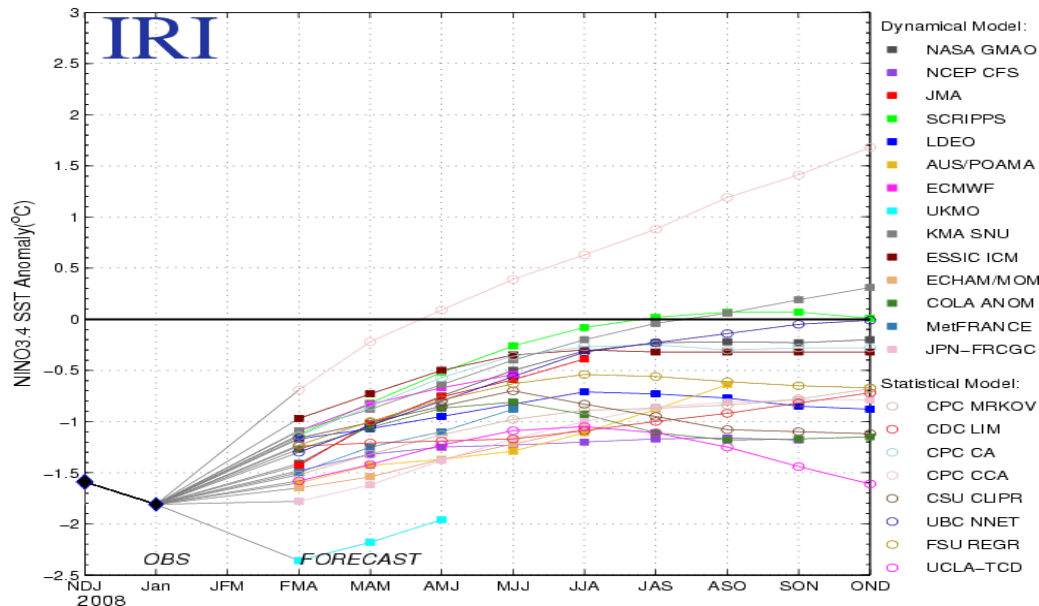


La Niña Sticks Around For The Spring

Temperatures and precipitation are expected to average near normal to above.

Very little change is expected this spring as far as the dominant La Niña Pacific pattern. In fact, as of mid winter the pattern had strengthened to a moderate-strong La Niña. Latest data shows this intensity should level off in the spring with a gradually weakening, thereafter.

Model Forecasts of ENSO from Feb 2008



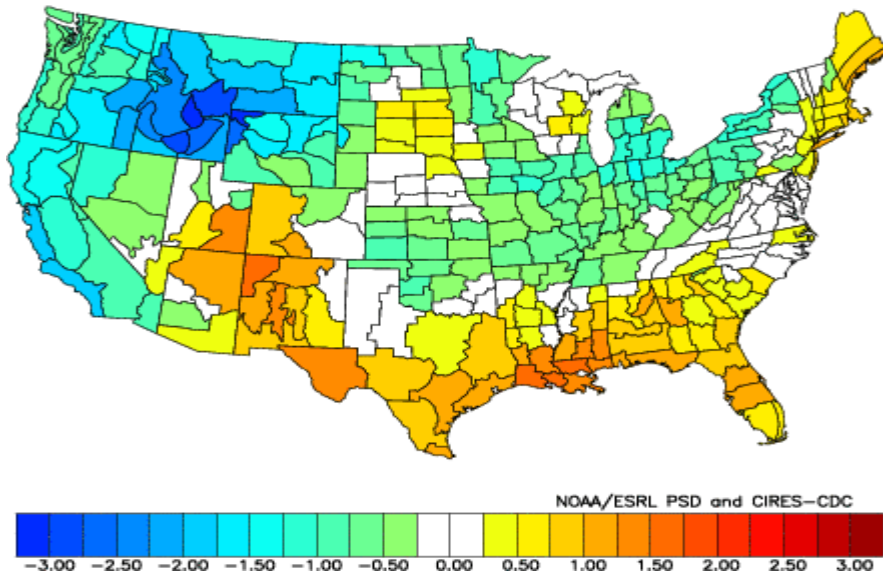
Analogue La Niña Springs: March

Since a potent La Niña is expected to persist throughout spring, we are able to use many of our winter analogues years with some subtractions and a few additions for spring

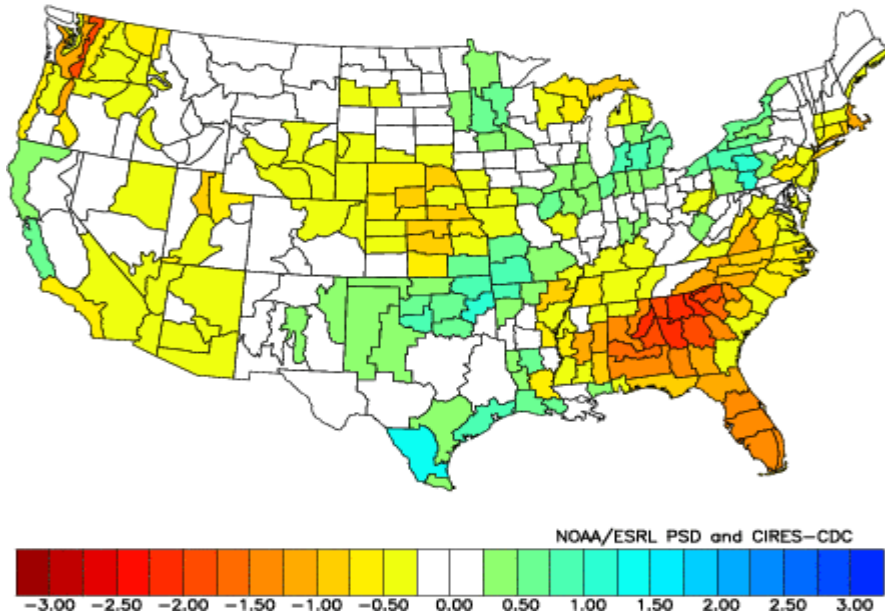
One question that has been asked more often than any other lately has been; Did the winter weather along with frequent storms prevail into March? Using our best analogue winter years for March, pretty well answers that question with a yes.

Temperatures tended to average below normal in March while precipitation was generally above. Check out the following composite March maps from the closest and best analogue years from this past winter for Southeast Lower Michigan. In March alone, below to normal temperatures are expected to prevail along with above normal precipitation.

Composite Temperature Anomalies (F)
Mar 1965,1974,1985,1999
Versus 1950–2007 Longterm Average



Composite Precipitation Anomalies (inches)
Mar 1965,1974,1985,1999
Versus 1950–2007 Longterm Average



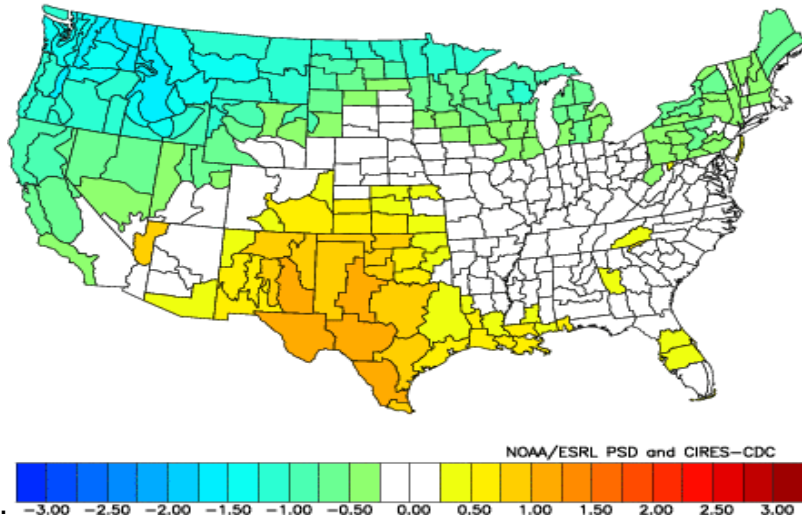
Remainder of Spring 2008

The following climate maps represent La Niña springs, some of which were moderate to strong in character. Below those, are the best winter analogue verification years (just used above for March). Interesting results are observed as we get two distinct temperature signals for the spring.

1) When the entire set of all the analogue La Niñas springs are used, a near to slightly below normal average occurred. 2) However, if the best performing past winter anomalies are run, then a warmer than normal spring winter was had. 3) If we add all La Niñas since 1950 to the mix, not surprising, we sit right between below and above again...just like the past winter.

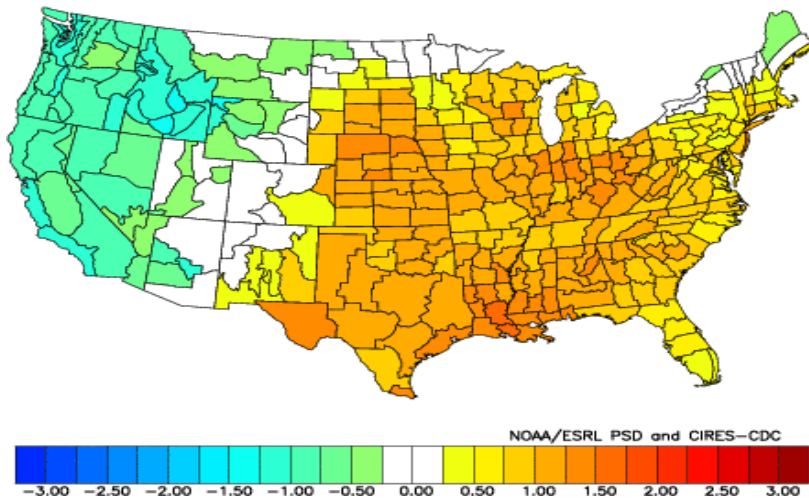
1)

Composite Temperature Anomalies (F)
Versus 1895–2000 Longterm Average
Mar to May 1904,1917,1925,1948,1950,1955,1965,1971,1974,1976
1985,1989,1996,1999

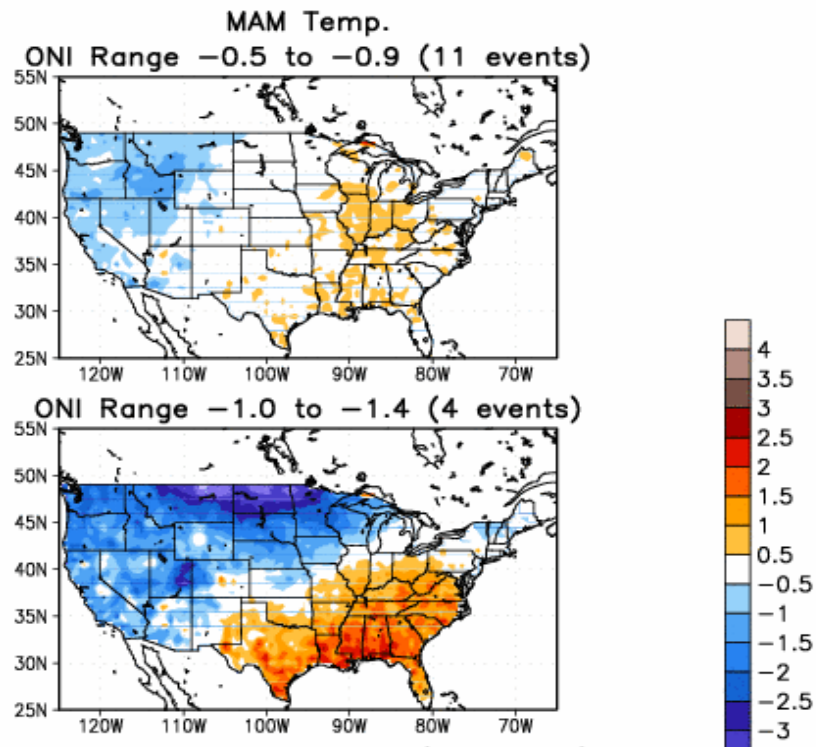


2)

Composite Temperature Anomalies (F)
Mar to May 1965,1974,1985,1999
Versus 1950–2007 Longterm Average



3)

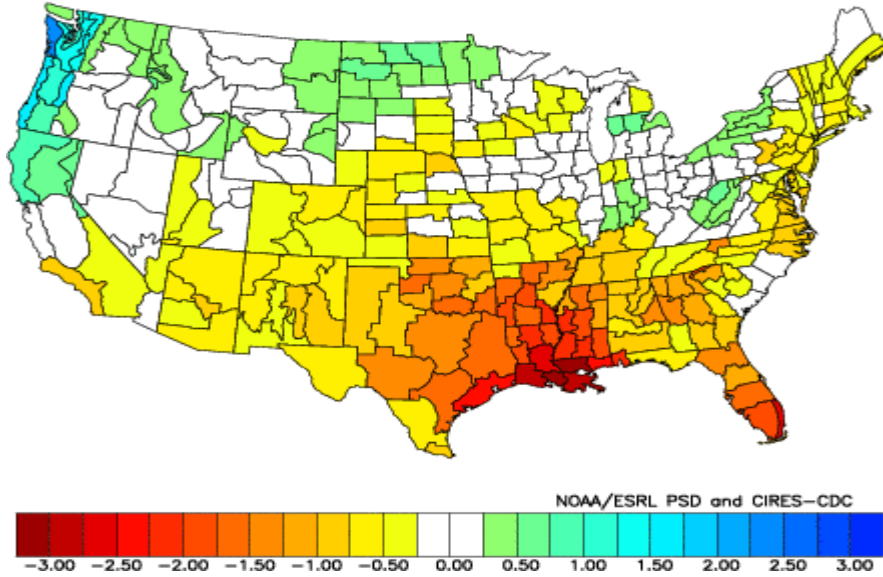


Precipitation

On the precipitation side of things, it pretty much made no difference with generally normal to above precipitation. The trend that was noted during the springs was they tended to start out wet but then dry-out (somewhat) mid late season, but for the entire spring: normal to above normal rainfall is projected.

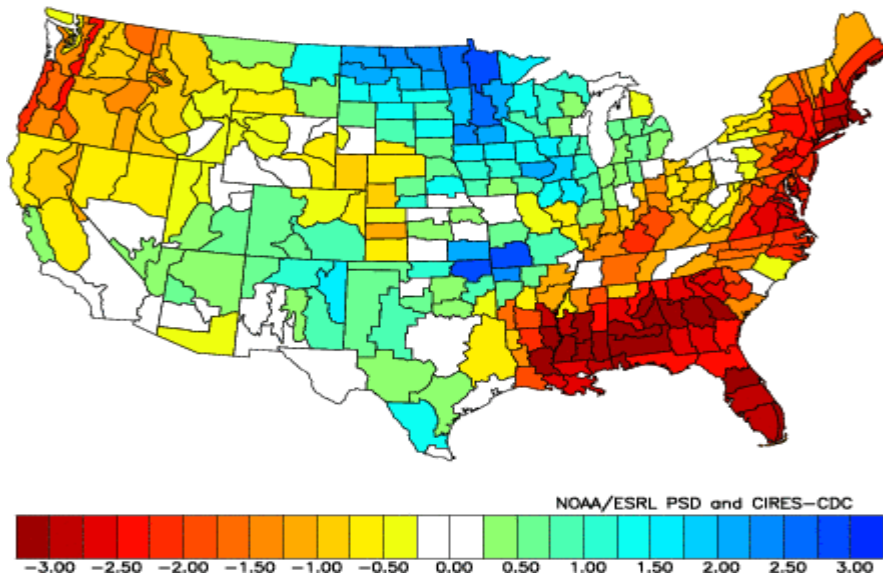
1)

Composite Precipitation Anomalies (inches)
Versus 1895–2000 Longterm Average
Mar to May 1904,1917,1925,1948,1950,1955,1965,1971,1974,1976
1985,1989,1996,1999



2)

Composite Precipitation Anomalies (inches)
Mar to May 1965,1974,1985,1999
Versus 1950–2007 Longterm Average

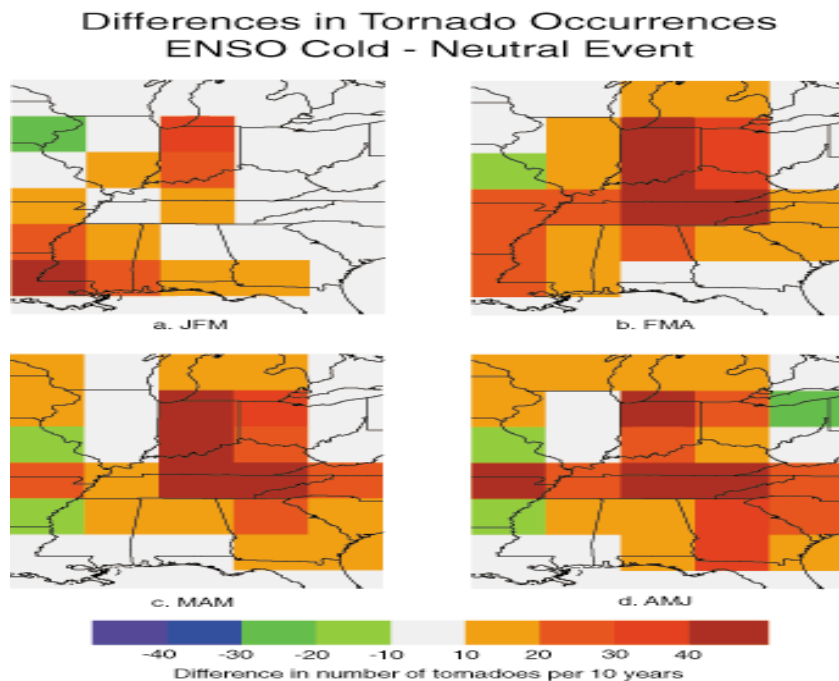


Higher Severe Weather Threat Than Average?

Since a strong jet stream is an important ingredient for severe weather, the position of the jet determines the regions more likely to experience severe weather and tornadoes during the severe weather season. The jet stream during our La Niña winter extended from the central Rockies, across the southern Plains and Midwest, northeast into the southern Great Lakes. Were this jet axis to continue over the region into the spring, severe weather possibility would be enhanced. During La Niñas, meteorologists have come to the conclusion that the number of tornadoes and severe thunderstorms are greater during these years in some areas. Eastern Nebraska, Western and Eastern Iowa, Northern North Dakota, Southeastern and Central Missouri, Southern Kansas, Eastern Wisconsin and Southern Illinois have all had enhanced numbers of significant tornadoes and tornado days reported during La Niña years. Since Michigan lies just northeast of this area, our risk also jumps as seen below. In addition, there were major outbreaks in many (but not all) of our analogue springs, most notable; Tri State Tornado of 1925, the Palm Sunday Outbreak of 1965, the Super Outbreak in early April 1974 and the Tornado Outbreak on May31st, 1985 with 41 tornadoes in Ohio/Pennsylvania into Ontario.

A more in-depth paper written by Mark Bove and Dr. JJ O'Brien of the FSU Center for Ocean-Atmospheric Prediction Studies (COAPS) in 1999 utilized historic ENSO data thru 1992. Below are the differences in the seasonal number of tornado events in 2.5° by 2.5° bins during La Niña (cold events) as compared to neutral ENSO conditions.

(a) JFM season. (b) FMA season. (c) MAM season. (d) AMJ season.



The article can be accessed at:

http://www.coaps.fsu.edu/papers/impacts_ens0_tornadic_activity/tornpix.shtml#fig3

Nothing is ever cast in stone when dealing with Mother Nature but it probably would be a good idea to get a plan of action together on what to do when severe weather threatens! A good place to start,

<http://www.crh.noaa.gov/dtx/spotter/prepare2.php>

Look for the final winter review (and see where this incredibly snowy winter finally places in the record books) along with the Winter Outlook performance when the last snowflake melts.