

**WINTER ANALOGS FOR 2008-2009 WINTER**

ANOTHER METEOROLOGICAL WINTER HAS BEGUN. ITS TIME FOR OUR ANNUAL ANALOG EXERCISE OF COMPARING AUTUMN WEATHER AND ENSUING WINTER TEMPERATURES. UNLIKE THE TWO PREVIOUS WINTERS, THE EL NINO/SOUTHERN OSCILLATION (ENSO) INFLUENCE ON OUR WEATHER IS NOT EXPECTED TO BE AS DOMINATING. THE WINTER OF 2006-7 HAD A MODERATE EL NINO, THE WINTER OF 2007-8 HAD A STRONG LA NINA. THIS WINTER THE MOST LIKELY OUTCOME SHOULD BE EITHER ENSO NEUTRAL, (LA NADA), OR POSSIBLY A WEAK LA NINA.

WHEN THE ENSO GETS STRONG IN EITHER DIRECTION, IT BECOMES THE DOMINATING PLAYER IN OUR WINTER WEATHER REGIME. THIS WINTER WITH ENSO RATHER MUTED, OTHER LESS PREDICTABLE OCEANIC INFLUENCES WILL PLAY A GREATER PART. NEITHER THE PACIFIC DECADAL OSCILLATION (PDO) OR THE NORTH ATLANTIC OSCILLATION (NAO) ARE AS WELL FORECAST. THE FORMER AS THE NAME IMPLIES VARIES VERY SLOWLY. IT IS CURRENTLY IN A NEGATIVE STATE WHICH MEANS RELATIVE TO NORMAL WARMER WATER IS IN THE WESTERN PACIFIC OCEAN. THIS NORMALLY WOULD FAVOR A NEGATIVE OR Milder PACIFIC NORTH AMERICAN (PNA) TELECONNECTION. BUT THE PDO WAS PREDOMINATELY NEGATIVE DURING THE 1960S WHICH WAS ONE OF THE COLDEST AND SNOWIEST DECADES FOR THE NORTHEAST. A NEGATIVE PDO IS NOT THE DEATH KNEEL FOR SNOW. ONE OF OUR COOPERATIVE OBSERVERS STRATIFIED WINTER SNOWFALL IN PHILADELPHIA BASED ON PDO AND ENSO STATES. WINTERS WITH A NEGATIVE PDO AND WEAK LA NINA OR LA NADA STATES TENDED TO HAVE AVERAGE OR NEAR NORMAL SNOWFALL.

FOR THE OTHER OCEAN AND THE NORTH ATLANTIC OSCILLATION (NAO). UNLIKE THE PDO WHILE THE NAO MAY PREDOMINATE IN ONE POSITIVE OR NEGATIVE DIRECTION, IT RARELY STAYS THAT WAY FOR MORE THAN A FEW WEEKS AT A TIME. WHEN THE NAO IS NEGATIVE OUR WEATHER GETS COLDER AND OR STORMIER AS THE LAST HALF OF NOVEMBER WAS. WHEN IT IS POSITIVE, WE TEND TO BE WARMER AND LESS SNOWY LIKE LAST WINTER. THERE IS A VERY INTERESTING RESEARCH PAPER DONE BY DR LUKE OMAN FROM RUTGERS UNIVERSITY ABOUT THE RELATIONSHIP BETWEEN THE NAO AND SNOW IN PHILADELPHIA (OTHER PLACES IN THE NORTHEAST ALSO). THIS PAPER SHOWS A 44 PERCENT INCREASE IN SNOWFALL OVER ABOUT A 50 YEAR PERIOD WHEN THE NAO WAS NEGATIVE VS WHEN IT WAS POSITIVE. IF WE EXPAND THAT DIFFERENCE TO 1 STANDARD DEVIATION IN BOTH DIRECTIONS, THAT DIFFERENTIAL INCREASES TO A WHOPPING 198 PERCENT.

WHEN THE LA NINA OR EL NINO IS STRONG, IT CAN OVERWHELM THE NAO AND REDUCE ITS INFLUENCE ON OUR WEATHER. BUT WITHOUT A STRONG ENSO, THE FATE OF THIS WINTER WILL BE INFLUENCED MORE BY THIS LESS PREDICTABLE PARAMETER. THERE ARE A COUPLE OF METEOROLOGICAL AGENCIES THAT FORECAST THE NAO FOR THE WINTER: THE UKMET MET OFFICE IS EXPECTING ON AVERAGE A SLIGHTLY POSITIVE NAO OVERALL, THE GERMAN MET OFFICE IS EXPECTING A NEGATIVE NAO FOR THE MONTH OF DECEMBER AND A POSITIVE NAO FOR THE MONTH OF JANUARY.

SO THIS TAKES US BACK TO WHAT HAVE NEAR NORMAL AUTUMN TEMPERATURES AND ABOUT NEUTRAL ENSO CONDITIONS PRODUCED IN THE PAST IN PHILADELPHIA. ALL OF THESE ANALOGS HAD AN OCTOBER AND NOVEMBER THAT FELL WITHIN THE NORMAL THIRD OR TERCILE OF AVERAGE TEMPERATURES ALONG WITH AN ENSO STATE THAT WAS EITHER NEUTRAL OR A WEAK LA NINA. ANOTHER MEASUREMENT OF ENSO WHICH RELIES ON OTHER METEOROLOGICAL PARAMETERS IN ADDITION TO SEA SURFACE TEMPERATURE ANOMALIES IS CALLED THE MULTIVARIATE ENSO INDEX (MEI). THE MEI IS CURRENTLY IN A WEAK LA NINA STATE. OTHER METEOROLOGICAL AGENCIES AND THE CLIMATE PREDICTION CENTER'S CLIMATE FORECAST SYSTEM MODEL ARE PREDOMINATELY FORECASTING EITHER A WEAK LA NINA OR ENSO NEUTRAL CONDITIONS FOR THIS WINTER. THE ANALOGS MARKED WITH A \*\*\* HAD A STRONG LA NINA THE PREVIOUS WINTER AS WAS THE CASE IN THE WINTER OF 2007-8.

HERE ARE THE LUCKY SEVEN OF WHAT OCCURRED IN PAST ENSO NEUTRAL OR WEAK NINA WINTERS THAT HAD AN AVERAGE OCTOBER AND NOVEMBER. THIS IS BASED ON THE 136 YEARS OF RECORD IN PHILADELPHIA.

YEAR	ENSUING DEC	ENSUING JAN	ENSUING FEB	AVG TEMP	ENSUING PCPN	ENSUING SNOW
1897-8	38.1	35.4	35.6	36.4	11.42	19.4
1906-7	35.3	34.2	27.0	32.2	8.47	38.6
1921-2	35.6	31.2	36.7	34.5	7.88	28.0
1926-7	32.3	32.6	40.6	35.2	9.04	11.8
1956-7***	41.7	29.2	37.4	36.1	8.18	7.9
1983-4	33.2	26.2	38.7	32.7	12.40	21.6

2000-1***	31.3	32.5	37.4	33.7	8.63	26.1
AVERAGE	35.4	31.6	36.2	34.4	9.43	21.9
NORMAL	37.4	32.3	34.8	34.8	9.57	19.3

THE OFFICIAL CPC OUTLOOK FOR THIS WINTER IS FOR EQUAL CHANCES OF IT BEING WARMER OR COOLER THAN NORMAL. THE PRECIPITATION OUTLOOK HAS EQUAL CHANCES OF BEING EITHER WETTER OR DRIER THAN NORMAL. ENSO NEUTRAL AND WEAK LA NINA WINTERS BRING BACK TO CLIMATOLOGICAL NORMAL LEVELS THE CHANCES OF PHILADELPHIA HAVING EITHER A 6 INCH OR GREATER OR 10 INCH OR GREATER SINGLE SNOW EVENT THIS WINTER. SINCE THE WINTER OF 1949-50, THE CHANCES OF A 6 INCH OR GREATER SINGLE SNOW EVENT IN PHILADELPHIA IN ANY GIVEN WINTER IS ABOUT 75 PERCENT, A 10 INCH OR GREATER SINGLE SNOW EVENT ABOUT 25 PERCENT. AN INTERESTING ARTICLE ABOUT ENSO CLIMATOLOGY AND LARGE SNOW EVENTS CAN BE FOUND IN THE OCTOBER 2003 ISSUE OF WEATHER AND FORECASTING.

AS ALWAYS PAST PERFORMANCE IS NOT ALWAYS AN INDICATION OF FUTURE TRENDS. ENJOY THE WINTER OF 2008-9, ITS THE ONLY ONE OF ITS KIND WE WILL HAVE.



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