

**WINTER ANALOGS FOR 2009-2010 WINTER**

TIME ALWAYS MARCHES ON AND ITS TIME ONCE AGAIN FOR OUR SEMI-ANNUAL ANALOG FEST OF TRYING TO COMPARE THIS AUTUMN'S TEMPERATURES AND ENSO STATE WITH SIMILAR INSTANCES IN THE PAST.

THIS UPCOMING WINTER WILL FEATURE EL NINO CONDITIONS IN THE TROPICAL PACIFIC. MODEL CONSENSUS IS FOR A MODERATE TYPE EL NINO TO OCCUR. THE LAST TWO WINTERS THAT HAD MODERATE EL NINOS WERE 2002-3 AND 2006-7, ALMOST POLAR OPPOSITE WINTERS IN SPITE OF BEING IN THE SAME CATEGORY. THE 2002-3 EL NINO WAS MORE WEST BASED THAN 2006-7. THE 2002-3 EL NINO HAD A PACIFIC DECADAL OSCILLATION (PDO) THAT WAS STRONGLY POSITIVE AND THERE WAS A COLD WATER POOL AROUND NEWFOUNDLAND. THE 2006-7 EL NINO THE PACIFIC DECADAL OSCILLATION WAS MORE NEUTRAL, AND THERE WAS A WARM POOL AROUND NEWFOUNDLAND. SO FAR THIS AUTUMN THE EL NINO DOES LOOK MORE WEST BASED THAN 2006-7, THE PACIFIC DECADAL OSCILLATION HAS RECENTLY BEEN WEAKLY POSITIVE AND THERE WAS, BUT NOT AT THE PRESENT MOMENT, A NEWFOUNDLAND WARM POOL.

EARLIER THIS MONTH A WESTERLY WIND BURST ALONG THE EQUATOR CAUSED A RAPID WARMING OF THE TROPICAL WATERS WHICH BROUGHT THE SEA SURFACE TEMPERATURE ANOMALIES INTO THE LOW END OF THE STRONG EL NINO CATEGORY. SINCE THEN SEA SURFACE TEMPERATURE ANOMALIES HAVE STABILIZED. AS PER ITS NAME MOST EL NINOS PEAK IN DECEMBER BEFORE WEAKENING THE REST OF THE WINTER.

OTHER ATMOSPHERIC TELECONNECTIONS ALL AFFECT OUR WEATHER PATTERN. THE STATE OF THE REST OF THE PACIFIC IS MEASURED BY THE PACIFIC DECADAL OSCILLATION (PDO) IN THE LONGER TERM AND THE PACIFIC NORTH AMERICA OSCILLATION (PNA) IN THE SHORTER TERM. ON OUR SIDE OF THE COAST WE HAVE THE NORTH ATLANTIC OSCILLATION (NAO). WE ARE IN THE DECADAL CYCLE WHERE THE PDO IS AVERAGING NEGATIVE. THIS DOES NOT FAVOR PROLONGED RIDGING IN THE EASTERN PACIFIC, A POSITIVE PNA. BUT IN EL NINO WINTERS, THE PDO CAN AND HAS BECOME POSITIVE AS IT DID DURING THE WINTERS OF 1982-3 AND 1997-8.

MEANWHILE THE STATE OF THE ATLANTIC AS MEASURED BY THE NAO ALSO INFLUENCES OUR WEATHER. A POSITIVE NAO GENERALLY FAVORS Milder WEATHER WHILE A NEGATIVE NAO FAVORS COLDER AND STORMIER CONDITIONS ALONG THE EAST COAST. THE OUTLOOK FOR THE NAO FOR THIS UPCOMING WINTER IS MORE PROBLEMATIC THAN USUAL WITH MANY CONFLICTING SIGNALS. THE NEWFOUNDLAND WATER POOL AVERAGED WARM DURING THE LATE SPRING AND SUMMER. USUALLY THE WINTER FOLLOWS SUIT AND IS ONE OF THE REASONS THAT THE UKMET OUTLOOK FOR THIS UPCOMING WINTER IS FOR A POSITIVE NAO. BUT, (TU AL) OTHER RESEARCH HAS SHOWN CORRELATIONS BETWEEN LOWER THAN AVERAGE SURFACE PRESSURES SOUTH OF ALASKA AND OCEANIC TEMPERATURE DIPOLES AROUND JAPAN IN THE AUTUMN AND THE NAO FOR THE ENSUING WINTER. THE SOUTH OF ALASKA SURFACE PRESSURE AVERAGED LOWER THAN NORMAL AND THE JAPANESE OCEANIC DIPOLE BOTH CORRELATE TO A NEGATIVE NAO. ON THE OTHER HAND CLIMO RESEARCH HAS SHOWN ABOUT A 60/40 SWITCH BETWEEN THE NAO STATE IN OCTOBER AND THE ENSUING WINTER. THE NAO AVERAGED NEGATIVE IN OCTOBER. LASTLY THE NEWFOUNDLAND WATER POOL TURNED COOLER THAN NORMAL AFTER HURRICANE BILL PASSED AND HAS NOT LOOKED BACK YET.

IF THE EL NINO REMAINS AS STRONG AS IT HAS BEEN THE PAST TWO WEEKS, IT CAN OVERWHELM THE NAO AND PDO AND REDUCE ITS INFLUENCE ON OUR WEATHER. BUT WITHOUT A CERTAIN STRONG EL NINO, THE FATE OF THIS WINTER WILL BE INFLUENCED SOME BY THESE LESS PREDICTABLE TELECONNECTIONS. HENCE THIS IN ALL LIKELIHOOD MODERATE EL NINO WINTER FROM JUST A PDO AND NAO PERSPECTIVE AS OF TODAY LOOKS LIKE A CROSS BETWEEN THE WINTERS OF 2002-3 AND 2006-7.

THIS FINALLY TAKES US TO THE LIST OF EL NINO AUTUMNS IN THE PAST IN PHILADELPHIA. ALL OF THESE ANALOG YEARS HAD AN OCTOBER THAT WAS IN THE AVERAGE OR NORMAL TERCILE OF ALL OCTOBERS DATING BACK TO 1872 AND A NOVEMBER THAT AVERAGED WARMER THAN NORMAL, IN THE HIGHEST TERCILE.

HERE ARE THE BIG EIGHT OF WHAT OCCURRED WITH PAST EL NINOS THAT HAD AN AVERAGE OCTOBER AND WARM NOVEMBER. THIS IS BASED ON THE 137 YEARS OF RECORD IN PHILADELPHIA. THE NORMALS ARE THE CURRENT 1971-2000 NORMALS.

YEAR	ENSUING DEC	ENSUING JAN	ENSUING FEB	AVG TEMP	ENSUING PCPN	ENSUING SNOW
1877-8	40.8	33.0	36.9	36.9	6.41	N/A

1902-3	33.7	32.6	36.5	34.3	14.44	16.8
1930-1	36.6	36.2	37.4	36.7	6.59	4.1
1963-4	27.9	33.0	31.8	30.9	8.51	32.9
1982-3	41.3	34.1	34.0	36.5	8.14	35.9
1994-5	41.9	38.2	31.5	37.2	7.62	9.8
2004-5	37.8	31.8	36.1	35.2	10.23	30.4
2006-7	42.7	38.2	28.0	36.3	7.23	13.4
AVERAGE	37.8	34.6	34.0	35.5	8.65	20.5
NORMAL	37.4	32.3	34.8	34.8	9.57	19.3

THE OFFICIAL CPC OUTLOOK FOR THIS WINTER HAS THE PHILADELPHIA AREA ON THE BORDER BETWEEN EQUAL CHANCES TO OUR NORTH AND A SLIGHTLY GREATER CHANCE OF THE WINTER BEING COLDER THAN NORMAL TO OUR SOUTH. THE PRECIPITATION OUTLOOK HAS EQUAL CHANCES OF BEING EITHER WETTER OR DRIER THAN NORMAL.

SEASONAL SNOWFALLS HAVE TREMENDOUS VARIABILITY IN EL NINO WINTERS ONCE THE STRENGTH INCREASES TO MODERATE OR GREATER. THE STRONGER SUBTROPICAL JET ASSOCIATED WITH THE EL NINO NOT ONLY INCREASES THE FREQUENCY OF STORMS, BUT ALSO BRINGS IN RELATIVELY WARMER AIR. WE HAVE WITNESSED IT THIS AUTUMN WITH THREE STRONG NOREASTERS AND OTHER WEAKER SYSTEMS. THE QUESTION ALWAYS BECOMES HOW COLD WILL IT BE WHEN THESE STORMS ARRIVE. THE COLDEST AND SNOWIEST EL NINO WINTERS OCCUR IN PHILADELPHIA WHEN THE EL NINO REMAINS WEAK. IN PHILADELPHIA SINCE 1950 WEAK EL NINOS HAVE AVERAGED 28.1 INCHES OF SNOW, MODERATE EL NINOS 22.9 INCHES OF SNOW AND STRONG EL NINOS 16.6 INCHES OF SNOW.

USING A MODERATE EL NINO AS THE BEST ESTIMATE FOR THIS UPCOMING WINTER AND LOOKING BACK AT MODERATE EL NINOS SINCE 1950, WE FOUND THAT MODERATE EL NINOS HAVE ACCOUNTED FOR SEVEN OF THE FORTY-SEVEN SIX INCH OR GREATER MEASURED SNOW EVENTS IN PHILADELPHIA. FROM AN OVERALL PERSPECTIVE THEY HAVE ACCOUNTED FOR 15 PERCENT OF ALL THESE EVENTS IN SPITE THAT MODERATE EL NINOS ONLY COMPRISE 10 PERCENT OF ALL WINTERS SINCE 1950. THE LARGER SNOW EVENTS DURING MODERATE EL NINO WINTERS FAVOR THE 6 TO 10 INCH RANGE AS MEASURED IN PHILADELPHIA. SINCE 1950 THERE HAVE BEEN SEVEN EVENTS THAT HAVE EQUALED OR EXCEEDED SIX INCHES OF SNOW AND ONE THAT HAS EQUALED OR EXCEEDED TEN INCHES.

THE QUESTION WE WISHED WE KNEW THE ANSWER TO WAS WHETHER THIS UPCOMING NINO WINTER WOULD BE A ONE HIT WONDER LIKE 1994-5 OR GO PLATINUM LIKE 1982-3 OR 2004-5. AS ALWAYS PAST PERFORMANCE IS NOT AN INDICATION OF FUTURE TRENDS. WE HOPE EVERYBODY HAS A VERY HAPPY AND HEALTHY THANKSGIVING AND UPCOMING HOLIDAY AND WINTER SEASON. THE SALT HAS BEEN PURCHASED AND THE SNOW THROWER IS GASSED AND READY TO GO.



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