

WINTER ANALOGS 2013-2014

.CLIMATE...

ITS OUR ANNUAL LOOK TO SEE IF THE PAST CAN HAVE SOME CLUES AS TO HOW THIS UPCOMING WINTER WILL BE. GIVEN THE RARE COMBO AGAIN OF A WARM (TOP THIRD) OCTOBER AND A COLDER THAN THE LONG TERM MEDIAN NOVEMBER, WE HAD TO ASK SOME ARCHAEOLOGISTS FOR ASSISTANCE. WHILE LAST AUTUMN WE HAD A SIMILAR COMBINATION, THE NON-TROPICAL PACIFIC OCEAN IS IN A WHOLE DIFFERENT LEAGUE AND FOR BETTER OR WORSE 2012-13 DID NOT MAKE THE CUT.

IN TERMS OF ENSO, THE LATEST CONSENSUS OF ALL DYNAMICAL MODELS FOR A DECEMBER, JANUARY AND FEBRUARY AVERAGE IS A MR. BLUTARSKY 0.0C. THE OUTLOOK CONSENSUS LEADING INTO THE SUMMER OF 2014 IS FOR AN EL NINO TO START DEVELOPING. THERE ARE ALREADY WARMER RELATIVE TO NORMAL WATERS ALONG THE EQUATORIAL PACIFIC WEST OF THE ENSO 3.4 REGION. FOR THIS REASON, THE ANALOGS CHOSEN VARIED FROM ENSO NEUTRAL NEGATIVE TO A WEAK EL NINO. BECAUSE OF THE DIRECTIONALITY, WE ONLY INCLUDED ONE WEAK LA NINA BECAUSE ITS DEPARTURES SINCE AUGUST WERE SIMILAR TO THIS YEAR.

CLIMATOLOGICALLY SPEAKING SINCE THE WINTER OF 1949-50, THERE HAS BEEN AN INTERESTING CLIMATOLOGICAL SPLIT WITH ENSO NEUTRAL WINTERS IN PHILADELPHIA. ENSO NEUTRAL POSITIVE WINTERS HAVE LACKED LARGER SNOW EVENTS. THERE HAS BEEN ONLY TWO SIX INCH OR GREATER EVENTS (OUT OF SIX ENSO NEUTRAL POSITIVE WINTERS) SINCE 1950. COMPARE THIS TO A WEAK EL NINO THAT HAS HAD EIGHT (OUT OF TEN WINTERS) AND ENSO NEUTRAL NEGATIVE THAT HAS HAD THIRTEEN (OUT OF FOURTEEN WINTERS). OF LATE SNOW STORMS THAT HAVE AFFECTED OUR AREA HAVE BEEN MORE WHOPPERS THAN RUN-OF-THE-MILL ONES. OF THE TWENTY-ONE TEN INCH OR GREATER EVENTS IN PHILADELPHIA SINCE 1950, TWELVE OF THEM HAVE OCCURRED SINCE THE WINTER OF 1995-96 AND FIVE OF THE LAST SIX SNOWFALL EVENTS THAT HAVE CROSSED THE SIX INCH THRESHOLD WERE TEN INCHES OR MORE.

LAST WINTER THE OUTLOOK TREND WAS TOWARD EL NINO, BUT THE EASTERN NON-TROPICAL PACIFIC WAS MORE HOSTILE. TAKING US TO THE REST OF THE PACIFIC. WARMER THAN NORMAL SEA SURFACE TEMPERATURE DEPARTURES HAVE MADE IT INTO THE EASTERN PACIFIC. THE PACIFIC DECADAL OSCILLATION WHICH WAS STRONGLY NEGATIVE LAST FALL AND WINTER (WHEN THE WARMEST WATERS WERE CONFINED WEST), IS CLOSER TO NEUTRAL HEADING INTO THIS WINTER. WE HAVE ALREADY SEEN THE EFFECTS OF THIS IN NOVEMBER AS THE EASTERN PACIFIC OSCILLATION TELECONNECTION INDEX HAS BEEN NEGATIVE (MORE EASTERN PACIFIC RIDGING) AND HAS SET IN MOTION A STRING OF VERY STRONG HIGH PRESSURE SYSTEMS FROM CANADA INTO THE UNITED STATES.

AS FOR TRYING TO OUTLOOK THE NORTH ATLANTIC OSCILLATION WE HAVE LOOKED AT APPROXIMATELY SEVEN DIFFERENT METHODS THAT HAVE HAD SOME DEGREE OF SUCCESS IN THE PAST. THE SCOREBOARD FOR THIS WINTER IS THREE FOR NAO POSITIVE, AND FOUR FOR NAO NEGATIVE. THE MORE POPULAR ONE (DEFACTO NAO BECAUSE IT IS AN AO OUTLOOK. THE FORMER NORMALLY FOLLOWS ABOUT 75 PERCENT OF THE TIME) OF LATE HAS BEEN THE ADVANCE OF SNOW COVERAGE IN SIBERIA IN OCTOBER. FROM THE RUTGERS WEB SITE, WE SAW THAT SNOW COVERAGE ADVANCED QUICKLY IN SEPTEMBER AND THE FIRST HALF OF OCTOBER, BUT THEN SLOWED IN THE SECOND HALF OF OCTOBER. IN SPITE OF THIS, EURASIAN SNOW COVERAGE FOR THE MONTH OF OCTOBER WAS THE GREATEST SINCE 2002. LOCALLY WE HAVE FOUND ITS A BETTER INDICATOR OF SNOW THAN TEMPERATURES. SEASONAL SNOWFALL STATISTICALLY SPEAKING IS NOT A NORMAL DISTRIBUTION, BUT A GAMMA DISTRIBUTION. THE SNOWY WINTERS SKEW THE AVERAGE HIGHER. THE MOST LIKELY OUTCOME FOR ANY GIVEN WINTER IS BELOW AVERAGE SNOWFALL. PHILADELPHIA'S MEDIAN SNOW SINCE 1967 HAS BEEN 17.75". SINCE SNOW COVERAGE HAS BEEN MAPPED BY SATELLITE, 33 PERCENT OF ALL WINTERS HAVE HAD SNOWFALL ABOVE THE CURRENT NORMAL. BUT WHEN EURASIAN SNOW COVER IS GREATER THAN NORMAL IN OCTOBER, THE PAST PERCENTAGE HAS INCREASED TO ABOUT 50 PERCENT. THIS DID NOT HELP US LAST WINTER. OF COURSE IF THE EPO REMAINS STRONGLY NEGATIVE, THE NAO STATUS WILL NOT

MATTER AS MUCH.

THIS TAKES US TO OUR FALL TEMPERATURES. OF THE 46 WARMEST WINTERS IN PHILADELPHIA ON RECORD, HALF OF THEM HAVE OCCURRED AFTER A WARM OCTOBER. THIS NOVEMBER WILL END RIGHT AROUND THE CUSP BETWEEN THE UNSEASONABLY COLD AND NORMAL TERCILES. REGARDLESS THIS IS A RARER OCCURRENCE AND A CONTRADICTION IN THE STUDY FIRST DONE IN WHICH THE STRONGEST CORRELATOR FOR A WARM WINTER IS A WARM OCTOBER WHILE THE STRONGEST CORRELATOR FOR A COLD WINTER IS A COLD NOVEMBER. OUR COLLEAGUE FROM ACROSS THE AISLE USED TO USE OCTOBER MINS AND NOVEMBER MAXES (THAT EXPLAINED ABOUT 50% OF THE VARIANCE) FOR HIS WINTER OUTLOOK. IN HIS STUDY, THESE TWO MONTHS WOULD NEARLY CANCEL EACH OTHER OUT.

SO THE YEARS IN THIS ANALOG MAY LOOK FAMILIAR, SOME WERE REPEATS FROM LAST WINTER'S OUTLOOK. OF THESE SEVEN, THREE WERE ENSO NEUTRAL NEGATIVE, TWO WERE ENSO NEUTRAL POSITIVE, ONE WAS A WEAK EL NINO AND ONE WAS A WEAK LA NINA. THERE WERE ABOUT 10 OTHER CANDIDATES, BUT WE REMOVED ANY THAT HAD UNSEASONABLY WARM OR COLD DECEMBERS. AT THIS JUNCTURE NEITHER EXTREME APPEARS LIKELY.

SO HERE ARE OUR LUCKY SEVEN ANALOGS FOR THIS UPCOMING WINTER FOR PHILADELPHIA. THEIR MILEAGE MAY VARY:

SEASON	DEC AVG	JAN AVG	FEB AVG	WINTER AVG	SEASONAL SNOWFALL*	WINTER PCPN
1882-3	36.2	30.6	37.0	34.6	N/A	11.14
1914-5	33.3	36.6	38.8	36.2	32.3	19.64
1924-5	36.2	31.8	42.2	36.7	12.1	8.52
1941-2	38.3	30.5	30.8	33.2	10.3	9.24
1951-2	38.7	37.3	38.2	38.1	16.2	7.58
1954-5	36.0	32.6	36.1	34.9	12.1	5.60

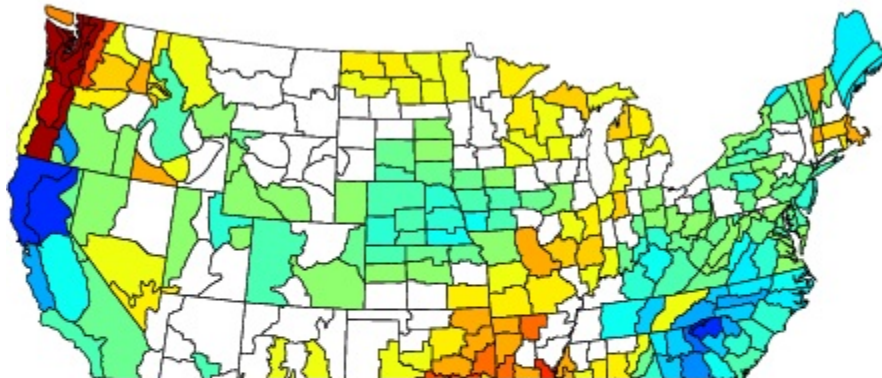
1959-0	38.2	34.2	35.4	35.9	21.8	10.17
AVG	36.7	33.4	36.9	35.7	17.5	10.27
1981-2010 NML	37.5	33.0	35.7	35.4	22.4	9.24

THE OFFICIAL CPC OUTLOOK FOR THE WINTER IS FOR EQUAL CHANCES OF IT BEING EITHER WARMER OR COLDER THAN NORMAL AND EITHER WETTER OR DRIER THAN NORMAL.

WE WANT TO WISH EVERYONE A VERY HAPPY THANKSGIVING AND MAY THIS WINTER LIVE UP TO YOUR EXPECTATIONS.

PLEASE SEE DIAGRAMS BELOW

Composite Precipitation Anomalies (inches)
 Dec to Feb 1914-15,1924-25,1941-42,1951-52,1954-55,1959-60
 Versus 1981-2010 Longterm Average



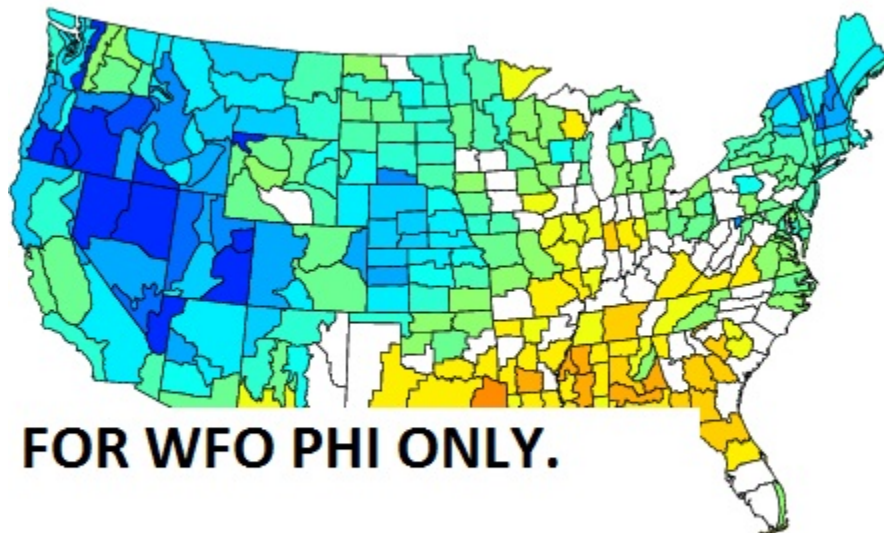
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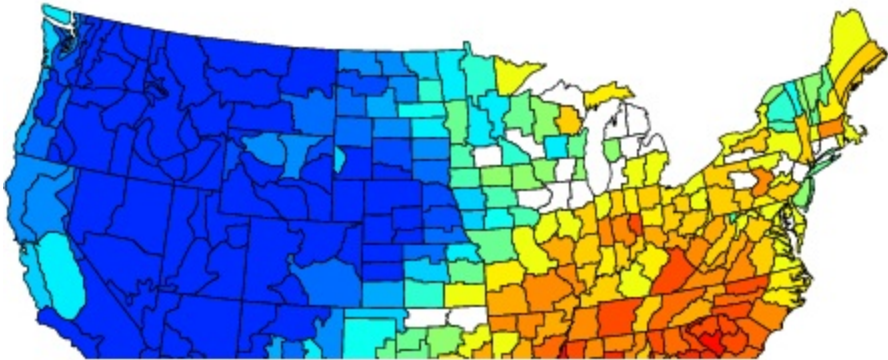
Composite Temperature Anomalies (F)
Dec to Feb 1914-15, 1924-25, 1941-42, 1951-52, 1954-55, 1959-60
Versus 1981-2010 Longterm Average



Composite Temperature Anomalies (F)
Dec 1914, 1924, 1941, 1951, 1954, 1959
Versus 1981-2010 Longterm Average



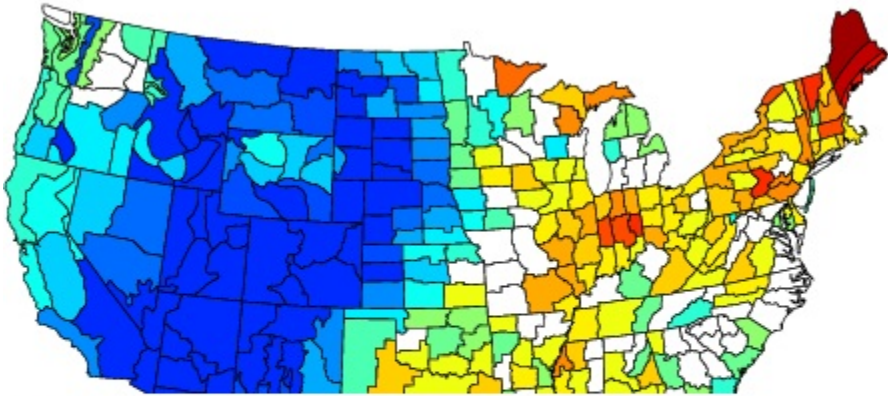
Composite Temperature Anomalies (F)
Jan 1915,1925,1942,1952,1955,1960
Versus 1981–2010 Longterm Average



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Composite Temperature Anomalies (F)
Feb 1915,1925,1942,1952,1955,1960
Versus 1981–2010 Longterm Average



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