

NORTHEAST REGIONAL CLIMATE CHANGES

ISSUE SUMMARY

Temperature trends in the past were based on a cherry-picked time period that started at the coldest period and ended during a cyclical peak. The same NOAA NCDC data will be shown which shows clearly the 60-70 year cyclical behavior of the temperatures in tune with cyclical behavior in both oceans. An examination between successive relative maxima and successive relative minima show little net changes over the last century in winter temperatures.

Future projections of temperatures are based on models which even lead authors of the IPCC admit GCMs can't be used to predict regional climate changes.

Other projections about snowfall and drought will be shown to relate to the same ocean based multidecadal behavior.

SPECIFIC ERRORS IN THE EF/TSD

TSD ES 3: All of the U.S. is very likely to warm during this century, and most areas of the U.S. are expected to warm by more than the global average.

TSD Page 29: Rising temperatures have generally resulted in rain rather than snow in locations and seasons where climatological average (1961–1990) temperatures were close to 0°C.

This document also addresses issues in the supporting document: CCSP USP Regional Change Impacts – Northeast Page 109 L15-L50

“NORTHEAST

“Since 1970, the annual average temperature in the Northeast has increased by 2°F, with winter temperatures rising twice this much. This warming has resulted in many other climate-related changes, including:

- *Less winter precipitation falling as snow and more as rain,*
- *Reduced snowpack*

Each of these observed changes is consistent with the changes expected in this region from global warming. The Northeast is projected to face continued warming and more extensive climate related changes, some of which could dramatically alter the region's economy, landscape, character, and quality of life.

- *Winters in the Northeast are projected to be much shorter with far fewer cold days.*

• The length of the winter snow season would be cut in half across northern New York, Vermont, New Hampshire, and Maine, and reduced to a week or two in southern parts of the region.”

CCSP: Page 112 L14-:L50

“Winter snow and ice sports, which contribute some \$7.6 billion annually to the regional economy, will be particularly affected by warming¹⁷. Of this total, alpine skiing and other snow sports (not including snowmobiling) account for \$4.6 billion annually.

Snowmobiling, which now rivals skiing as the largest winter recreation industry in the nation, accounts for the remaining \$3 billion¹⁹. Other winter traditions, ranging from skating and ice fishing on frozen ponds and lakes, to cross-country (Nordic) skiing, snowshoeing, and dog sledding, are integral to the character of the Northeast, and for many residents and visitors, its desirable quality of life.”

COMMENTS

The following comment focuses on the Northeast Region of the United States that the evaluation process has incorrectly captured past conditions by cherry picking start time of the data period in clear violation of the Federal Information Quality Act (IQA) which demands an honest assessment as the starting point for any analysis. The EPA failed in its responsibility by not doing an independent confirmation of the data and validation of the conclusions reached by others. All of the data used is in the public domain.

The models, regardless of scenarios used are failing. They can not thus be used to say it “is very likely the warming is very likely to be greater than observed warming over the past century.” Since it has been admitted by the IPCC modeler lead authors such as Kevin Trenberth (2007) that the models show no skill in predicting regional weather, there is no basis for any projections of impacts for any region especially when starting with an inaccurate initial assessment.

Trenberth noted in the Nature magazine weblog in 2007 “None of the models used by IPCC are initialized to the observed state and none of the climate states in the models correspond even remotely to the current observed climate. In particular, the state of the oceans, sea ice, and soil moisture has no relationship to the observed state at any recent time in any of the IPCC models. There is neither an El Niño sequence nor any Pacific Decadal Oscillation that replicates the recent past; yet these are critical modes of variability that affect Pacific Rim countries and beyond.

The Atlantic Multidecadal Oscillation, that may depend on the thermohaline circulation and thus ocean currents in the Atlantic, is not set up to match today’s state, but it is a critical component of the Atlantic hurricanes and it undoubtedly affects forecasts for the next decade from Brazil to Europe. Moreover, the starting climate state in several of the models may depart significantly from the real climate owing to model errors. I postulate

that regional climate change is impossible to deal with properly unless the models are initialized.”

Both the assessments and the climate projections based on unsound climate models, the projected impacts are in sharp contrast with reality including the impact on the winter sports industry, which has just enjoyed two successive record or near record snowfall winter sports seasons and in which a new all-time record for New England cold was set. Temperatures have declined this decade this region and globally in sharp contrast to the claims and model projections. All time snow records have been set in this region in recent decades in the major cities when the El Ninos dominated during the warm ocean cycle and in the northern winter sports areas when La Ninas dominated as the Pacific cooled especially the last two years. The snow was aided by changes in the Atlantic sector.

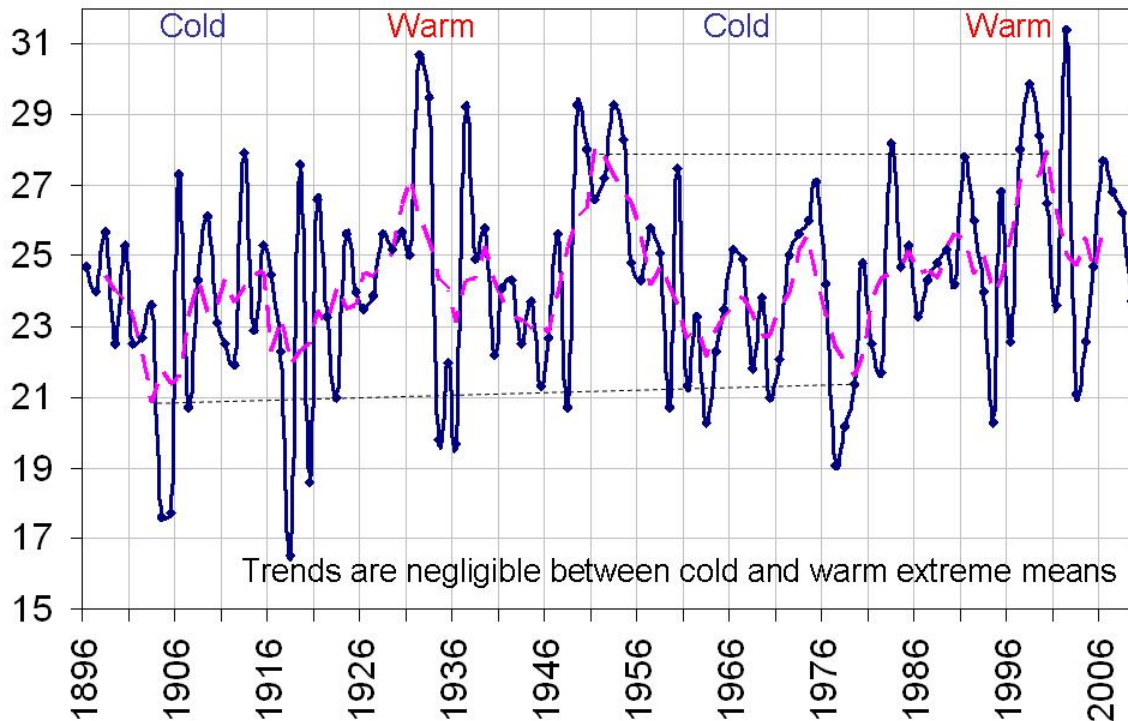
These multidecadal ocean cycles play a key role in the snowfall and hurricane threats in this region as shown by peer review literature and supported by analysis done by the author for presentations at the NWS Boston Winter Weather Workshops (1997-2008) and Northeast Emergency Management conferences (2006).

WINTER TEMPERATURES

The first comment here has to do with cherry picking the starting and end times to get the desired result, in this case an apparent warming to justify claims that greenhouse gases are to blame. You can show almost anything with cyclical data patterns. Your biased team members are masters at this deception in clear violation of the IQA. It appears the authors of this and other regional sections were not qualified meteorologists or climatologists as the information provided could not be done by anyone with those qualifications.

The climate of the northeast has shown a cyclical temperature and precipitation pattern in line with cyclical changes in the oceans (PDO and AMO). There is no sign of any net warming in winters which the document claims has had the greatest warming from maximum to maximum or minimum of the cycles. The plot below has as a source NCDC northeast regional Climate at a Glance temperatures.

NCDC Northeast Winter Temperatures



There is virtually no changes in the extremes, just a slight tendency for the coldest means being a little less, consistent with urbanization. The report chose 1970 as the starting point of the analysis to show warming that is not present in long term trends. These temperatures in the northeast cycle with both the PDO and AMO which influence relative frequency El Nino and La Nina and the frequency and strength of North Atlantic blocking (NAO).

DROUGHTS PEAKED IN THE COLD 1960S

The document has no sense of history as the greatest drought have occurred in cold eras like the 1960s. Not all droughts, however, are associated with higher than normal surface-air temperatures. The drought of 1962-65 in the northeastern United States is a well-documented example of a major drought that was associated with lower than normal surface-air temperatures in all seasons (Namias, 1966, 1968; Mitchell, 1968).

SNOWFALL MOVED TO THE CITIES DURING THE WARM PDO, NOW MOVING BACK TO SKI COUNTRY WITH COLD PDO

The second has to do with comments about *TSD Page 29: Rising temperatures have generally resulted in rain rather than snow in locations and seasons where climatological average (1961–1990) temperatures were close to 0°C. This also appeared in the IPCC AR4 3.3.2.3 on page 258.*

The average winter temperature in Boston, MA is 32F, the average January temperature in January in New York City is 32.1F. Both these cities set new records for single storm, seasonal and multiyear snowfalls in the last two decades.

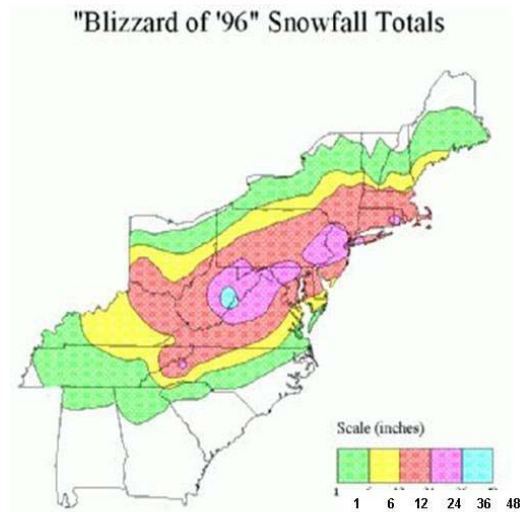
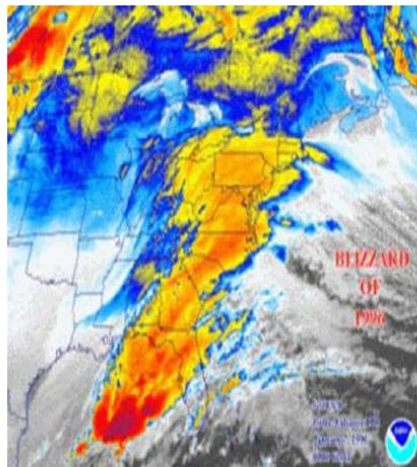
The snowfall in the northeast is affected by the PDO/ENSO and NAO. During the period from 1979 to 1998 when there was a positive PDO there were more El Ninos. The PDO popped positive again in the 2002-2005 winters with 3 relatively weak El Ninos.

El Ninos, especially weak ones have a suppressed southern storm track that favors snow for the coastal cities with generally less in northern New England ski areas. This has been shown by CPC in their ENSO city snowfall analyses.

The snowstorms are especially likely when the NAO is negative (Atlantic blocking exists) which has been more frequent after 1995 when the AMO went into its warm mode. A warm AMO favors a negative NAO.

Despite all the claims of disappearing snow and ice due to global warming, the last dozen years or so has been among the snowiest ever here in parts of the US and in other parts of the world with numerous all-time storm, season and multi-season snowfall records broken.

It started in March of 1993, when the “Storm of the Century” brought heavy snowfall (1 up to 4 feet) from Alabama to New York and New England (2-4 feet) with losses that totaled \$7.6 billion and approximately 270 deaths. Then in January of 1996, the “Blizzard of ‘96” deposited again 1-4 feet of snow over the Appalachians, Mid-Atlantic, and Northeast; followed by severe flooding in parts of same area due to rain and snowmelt inflicting approximately \$3.5 billion damage and 187 deaths.



“Blizzard of ‘96” January 1996. Very heavy snowstorm (1-4 feet) over Appalachians, Mid-Atlantic, and Northeast; followed by severe flooding in parts of same area due to rain and snowmelt; approximately \$3.5 billion damage/costs; 187 deaths.

That winter, with strong blocking suppressing the storm tracks, the snows started early and never stopped coming. All-time seasonal snowfall records were set in dozens of cities in the east and central states including Boston (107.6” or 286% of normal), New York City (75.6 inches of 276% of normal), Philadelphia (63.1 inches or 303% of normal) and Baltimore, MD (63.5 inches or 303% of normal).

THE LOCATIONS WHERE 1995/96 SNOWFALL EXCEEDED ALL-TIME RECORDS			
Station	Total	Norm	%Norm
Marquette, MI	250.8	129.0	194%
Sault Ste. Marie, MI	216.3	115.5	187%
Blue Hill Observatory, MA	143.8	59.6	241%
Elkins, WV	136.6	76.3	179%
Duluth, MN	135.4	78.2	173%
Binghamton, NY	133.4	82.9	161%
Worcester, MA	132.9	68.5	194%
International Falls, MN	116.0	64.2	181%
Windsor Locks, CT	115.2	48.0	240%
Boston, MA	107.6	41.7	258%
Providence, RI	106.1	36.1	294%
Charleston, WV	105.9	32.6	325%
Mansfield, OH	90.5	41.8	217%
Williamsport, PA	87.7	41.8	210%
Newark, NJ	78.4	27.5	285%
Bridgeport, CT	76.8	25.6	300%
N.Y.- Central Park, NY	75.6	28.4	266%
N.Y.- JFK Airport, NY	69.0	23.0	300%
Philadelphia, PA	63.1	20.8	303%
Jackson, KY	62.7	21.9	286%
Baltimore, MD	62.5	20.6	303%
Dulles Airport, VA	61.9	22.5	275%
Lynchburg, VA	56.8	17.9	317%
National Airport, VA	46.0	16.4	280%

February 11-12th 2006 a blizzard set new all-time snowstorm record for Central Park in New York City with 26.9 inches. On February 17-18, 2003, a snowstorm set new all-time snowfall record for Boston with 27.5 inches. Another blizzard on January 24-25 2005

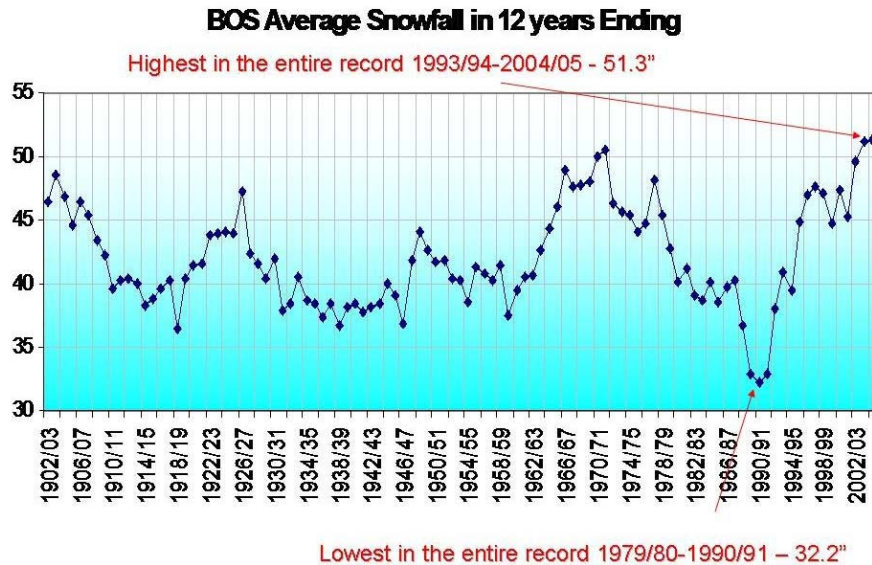
brought 22.5” at Boston’s Logan Airport, along with high winds, 6 foot drifts and bitterly cold temperatures. Many measurements however near Logan were 27-28” and the storm was compared by many to the blizzard of ’78.

Despite the CCSP and IPCC claim in their 4th Assessment that cities with winter average temperatures near 32F are seeing less snowfall and more rainfall, this is not the case in the eastern United States. In the last few years, all time single storm records were shattered in the northeast cities. With an average winter temperature of 32F. Boston since 1992/93 had had 5 years that rank among the top 10% snowiest winters in over 130 years of record, including numbers 1, 3, 5, and 7 (source Boston NWS).

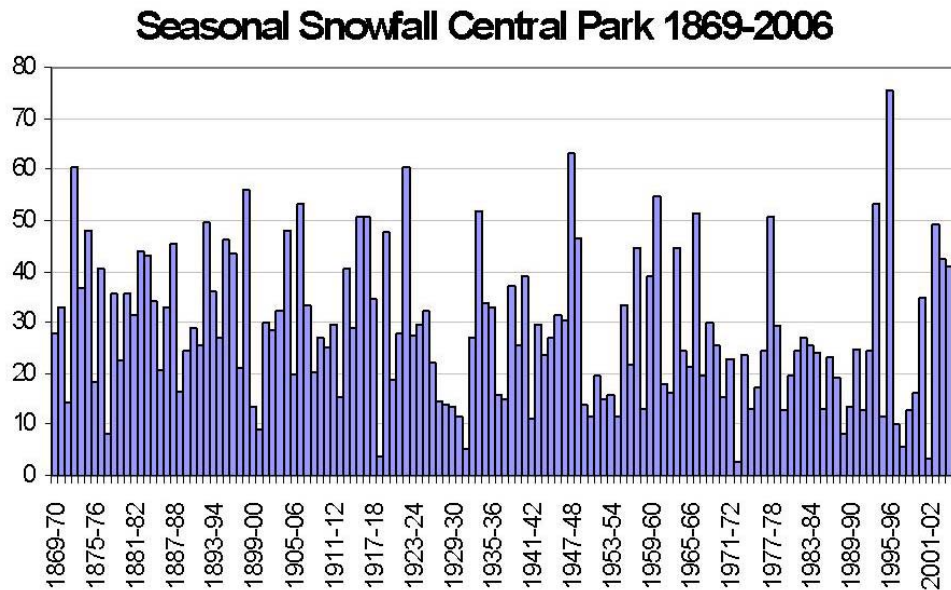
Boston’s Snowiest Winters

Season	Snowfall
1995-96	107.6
1873-74	96.4
1993-94	96.3
1947-48	89.2
2004-05	86.6
1977-78	85.1
1992-93	83.9
1915-16	79.2
1919-20	73.4
1903-04	73.1
1886-87	73
2002/03	71.3

If you do a running mean of average snowfall over dozen years, the period from 1993/94 through 2004/05 for Boston, the average is the highest in the entire record dating back to the 1880s.



New York City (with annual snowfall data back to 1869) has an average January temperature (their coldest month) of 32F. New York City for the first time EVER ending in 2005/06, had four successive years with over 40 inches of snow. Its four-year running mean was the highest its entire 137 year record.



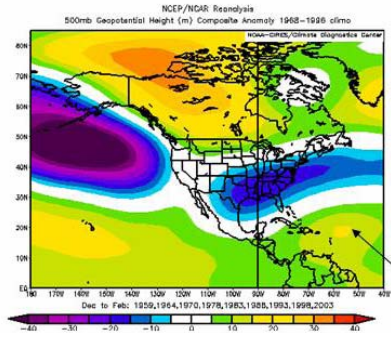
WHAT IS BEHIND THIS SNOWFALL BLITZ?

Snowfall here in the Northeast relate to decadal scale cycles in the Pacific, Atlantic and Arctic.

When the Pacific Decadal Oscillation flipped from its cold to warm mode in the Great Pacific Climate Shift in 1977, El Nino frequency increased. In the warm mode, more El Ninos are favored (two to one over La Ninas), and when they are weak to moderate this often translates into heavy snows in the eastern United States especially when the Quasi-Biennial Oscillation (QBO) is west.

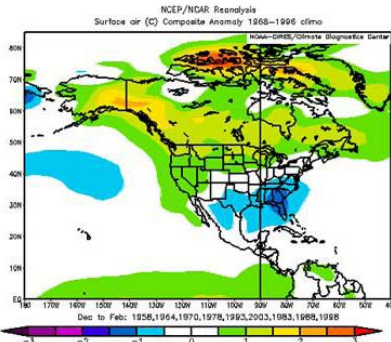
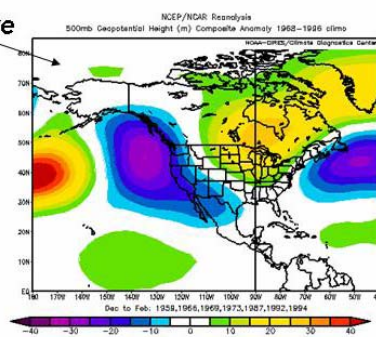
CPC research by Barnston, Halpert and Livsey (1991) showed how a west QBO El Nino favors the positive PNA pattern with an eastern trough which predisposes the east to east coast storms. Indeed 2/3rds of the top dozen heaviest snow years since the 1870s for Boston were El Nino West QBO seasons.

El Nino West QBO Years

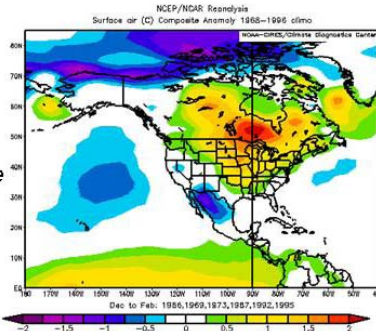


Negative TNH
500mb Height Anomalies
Positive PNA

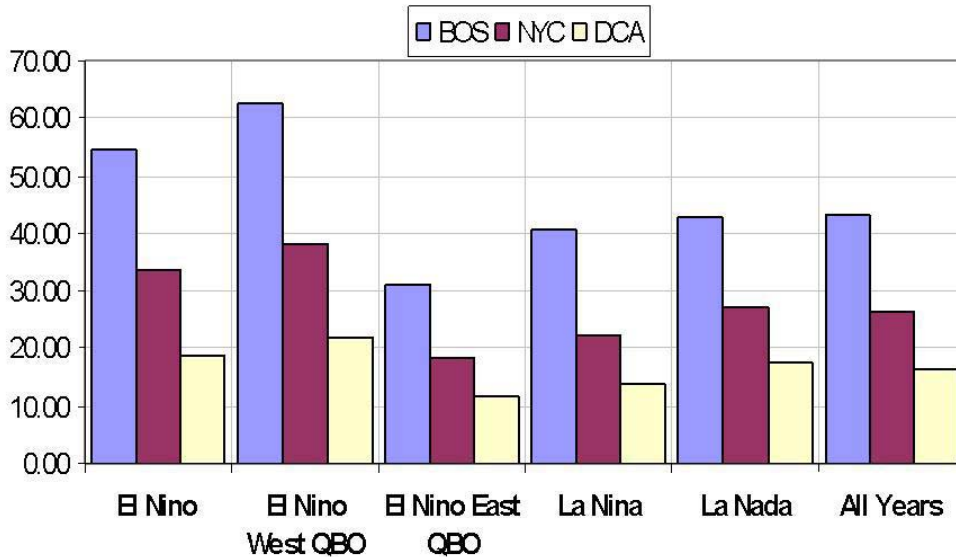
El Nino East QBO Years



Surface Temperature Anomalies



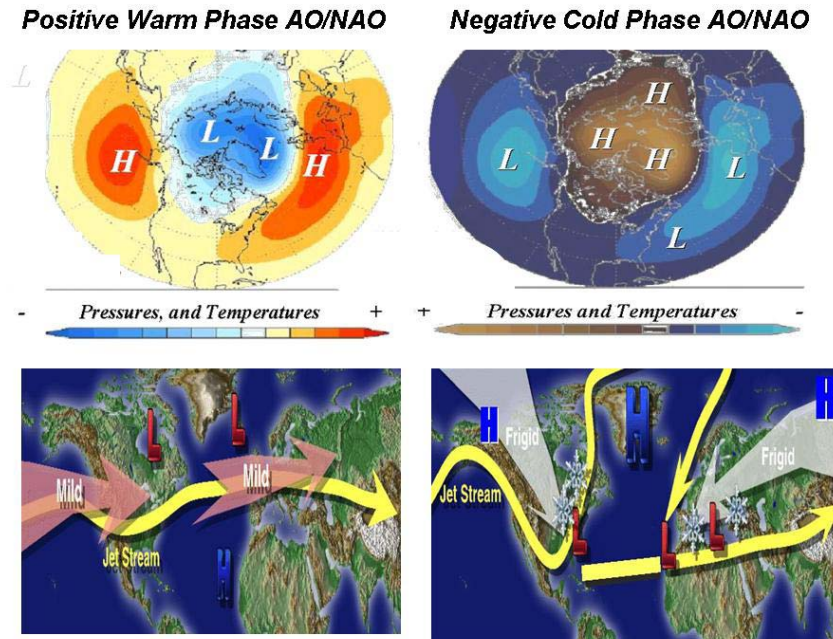
Seasonal Snow vs ENSO (Inches)



Also important to the snow increases has been a shift of two atmospheric oscillations, which generally operate in tandem, the North Atlantic Oscillation (NAO) and Arctic Oscillations (AO). These oscillations have significant control over the weather pattern including winter storm tracks and temperatures in both Europe and the eastern United States.

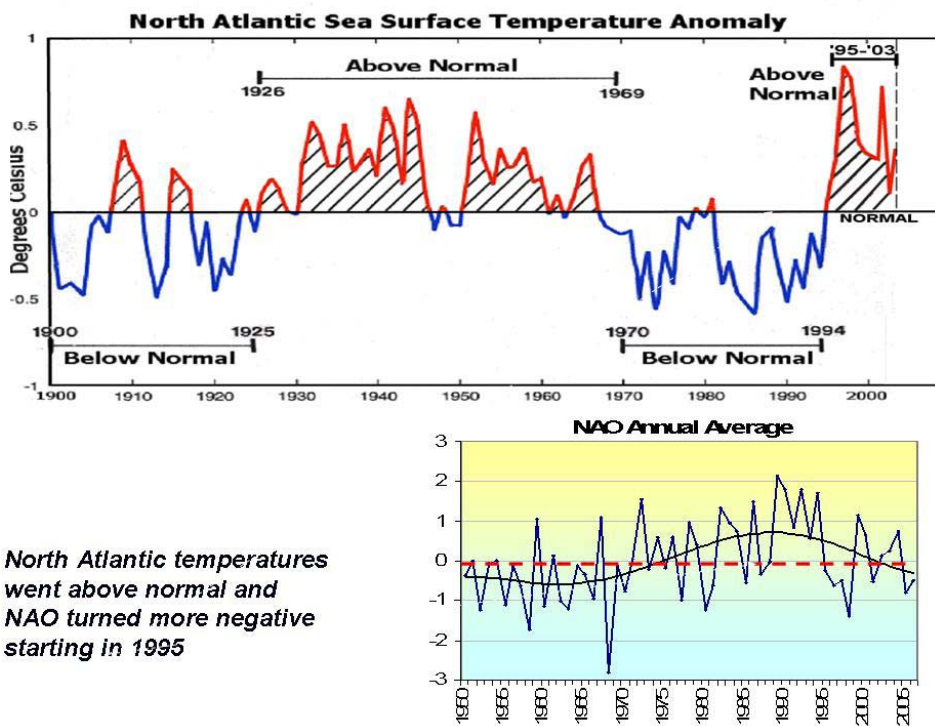
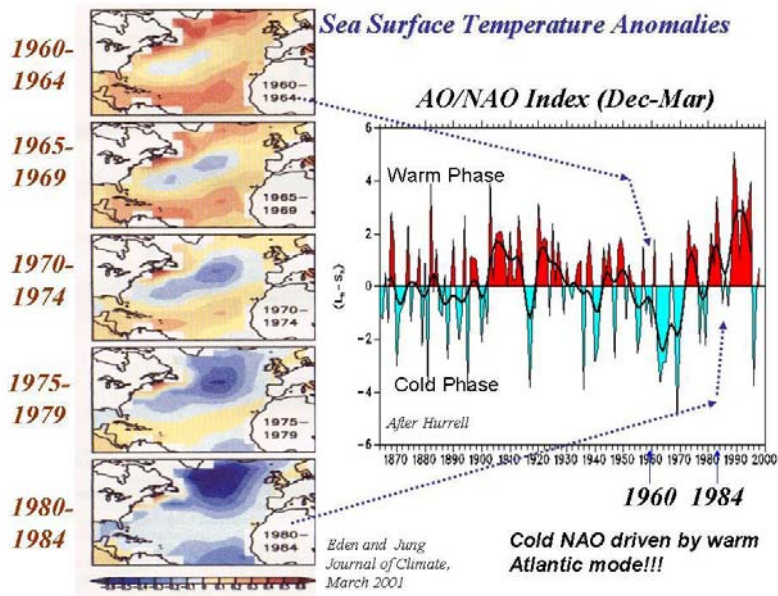
Since the middle 1990s, these oscillations have more often been in the phase that favors cold and snow (the negative or 'cold' phases) in both Europe and the eastern United

States. Like the PDO, the NAO and AO tend to be predominantly in one mode in the other for decades at a time.



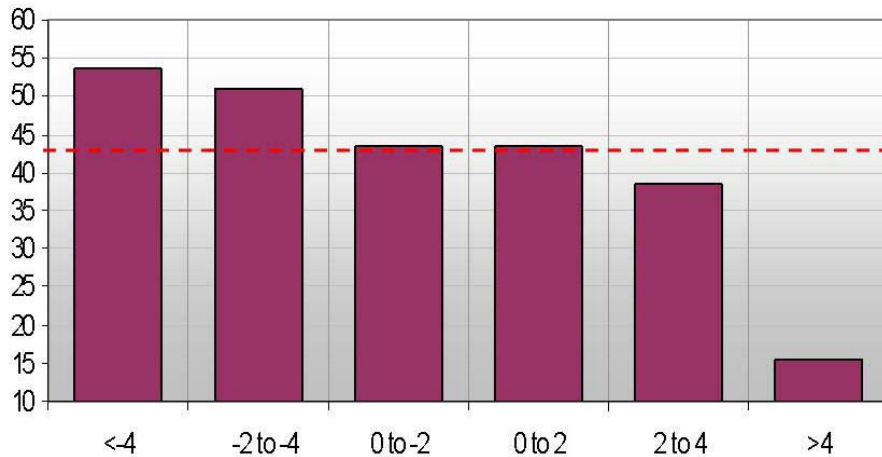
The Atlantic Multidecadal Oscillation is responsible for the NAO/AO decadal tendencies. When the Atlantic is cold, the AO and NAO TEND towards the positive state, when the Atlantic is warm on the other hand, the NAO/AO TEND to be often negative. This means high latitude blocking and enhanced coastal storm activity in the United States and Mediterranean storms that bring snows to Europe.

This can be seen by comparing the decadal ocean anomalies (Eden and Jung (2001) with the NAO ([Hurrell](#)))

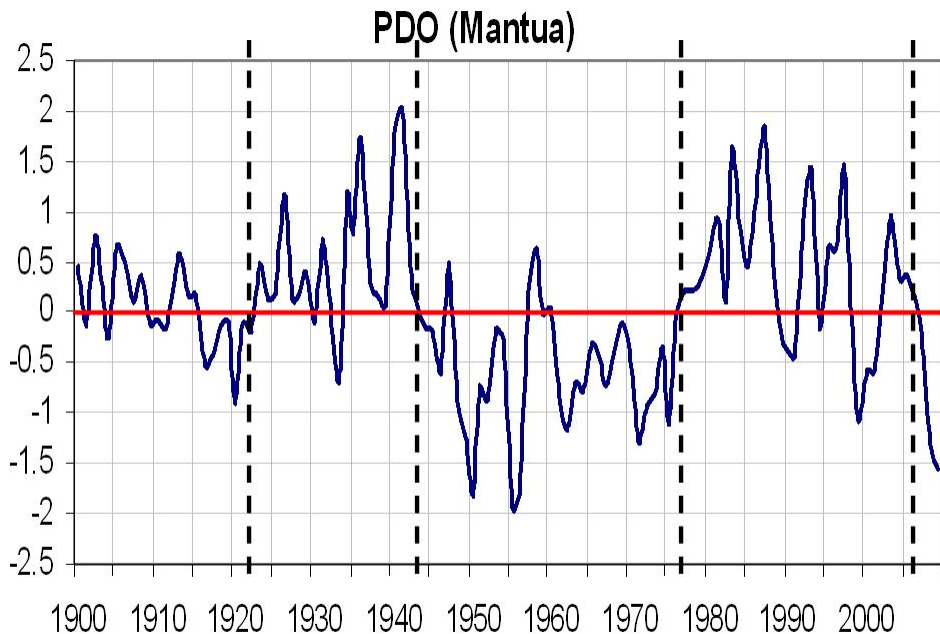


North Atlantic temperatures went above normal and NAO turned more negative starting in 1995

BOS Seasonal Snowfall (Inches) vs DJFM NAO



Meanwhile northern New England gets shortchanged when the major cities get heavy snows in many El Nino winters. La Nina and a cold PDO is the recipe for above normal northern area snowfall. This was clearly seen in the frigid and very heavy snow La Nina winter of 2000/01 which had strong blocking when the northern half of New England was paralyzed by major snowstorms early and especially again late (March). 2007/08 and 2008/09 had that same recipe with a La Nina and cold PDO and all-time snow records were set in areas Concord New Hampshire north and east, in some places where 120 plus years of records were kept.



The PDO has turned strongly negative, the storm tracks have shifted north back to where they were during the last cold phase in the late 1940s to late 1970s. The results have been the heavy snow for the cities NYC south shifted north to the North Country.

2007/08 was the best ski season on record for many areas from the west to the Midwest, Great Lakes and northeast. Ironically it came just months after a conference on Mount Washington which predicted a disastrous future for the winter sports and tourism industry much as this totally bogus report. This past winter was very nearly as snowy and ideal for the winter sports industry.

Given the switch to the cold PDO, continued warm AMO for another decade and a very low solar, the northeast will see colder snowier winters across the north and milder and drier winters in the mid-Atlantic on average. The occasional weak El Ninos will be cold and snowy in the cities down to the Mid-Atlantic especially when the QBO is west and NAO negative. Temperatures will continue the slow decline seen in the last 8 years or so, perhaps accelerating if the solar cycles is a Dalton type minimum as many solar scientists project. Instead of becoming more like the Carolinas, New Hampshire will become more like Quebec in the next few decades.

Summary:

Temperatures in this region undergo a cyclical change of 60-70 years in tune with multidecadal cycles in both the Atlantic and Pacific. There is no statistically significant longer term trend that can be linked to greenhouse gases. Droughts were shown to occur during the cold eras in this region

Snowfall has set records in the cities of the northeast region in recent years in conflict with statements and projections. The snowfall has shifted into the northern areas where winter sports are a main business with the shift back into the cold modes of the oceans the last few years. As we have shown, the northeast decadal weather regimes in snowfall relate to the cyclical behavior of the oceans and have little to do with greenhouse gases. Natural variability not man controls the climate.

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