# Record Setting AO and SOI Combo Work with Other Factors to Create a Wild Winter

Today, March 01, 2010, 20 hours ago

It has been a winter for many to remember (or forget). There are lots of reasons why. The sun is just coming out of a very long slumber for one. Lets look at some of the other factors likely at play. In April 2009, we talked about Mt Redoubt's eruption (and later Russia's Sarychev) and the effect it might have on high latitude blocking and cooling summer and winter. Starting on March 22, a series of major eruptions have taken place from Mt. Redoubt in Alaska. The biggest exceeded 65,000 feet in height. More than a dozen eruptions as high as 60,000 have followed.

### **Snowmageddon for the Mid-Atlantic**

Monday, February 22, 2010, 12:00:00 AM

The last few years, the media ignored the snow that set all-time records further north in much of western and southern Canada, Washington, Oregon, Colorado, Iowa, North Dakota, Wisconsin, Michigan, Vermont, New Hampshire and Maine and overseas in Europe, south China, Middle East, South America and New Zealand. But when it falls in the normally bare ground Mid-Atlantic and especially in the capitol where the politicians, environmental NGO and alternative energy lobby calls home, it can no longer be ignored. Especially on a day when NOAA had planned a press release on their new Climate Service, which had to be done via a phone teleconference. So the green media and alarmists spin the tale that these storms are what you expect during global warming. Actually friends they conflict with statements from the IPCC and EPA Technical Support Document that drew on the NOAA CCSP.

### A Tale of Two Observatories and a Winter's Tale

Monday, February 15, 2010, 12:00:00 AM

It was the signature of a place that prides itself as the Home of the World's Worst Weather, a claim to fame that attested to conditions few could withstand, much less embrace. For six decades, the world record for the highest wind speed ever registered - 231 miles per hour! - was their calling card, their identity. And now it is gone, toppled by a cyclone that pushed the anemometer to 253 on an island off the coast of Australia. AS the Boston Globe reported: "For the self-proclaimed "weather geeks" who pull weeklong shifts measuring Mount Washington's extreme meteorological mix of driving blizzards, bitter cold, and blusterous wind, it hurts like snowburn.

### **Another Round of Cold As Promised**

Monday, February 08, 2010, 12:00:00 AM

After a cold October, a warm November, a cold December and early January, a January thaw set in on its normal third week of January schedule. We promised the cold would be

back and it returned in week 4. The cold spells related to stratospheric warmings favored in east QBO low solar years and in years following high latitude volcanoes like we saw in Redoubt, Alaska and Sarychev, Russia. The following link will provide an illustration of the degree to which this phenomenon has blossomed in the past several weeks.

## 2010's Historic Cold Spell in Florida and Southeast, Powerful Storms in California, Monstrous Snows in Arizona Mountain

Monday, February 01, 2010, 12:00:00 AM

Florida – Worst Freeze since 1989 Temperatures plunged to levels not seen in 20 years over south Florida in the wake of the arctic cold front which blasted through the region on the weekend of January 9-10, 2010. Temperatures remained at or below 50 degrees for more than 48 consecutive hours, finally rising above 50 during the late morning to midday hours on Monday the 11th. Although no records are kept of consecutive number of hours at or below 50, it is likely that this streak is among the longest on record. Snow sleet and even freezing rains occurred in places where northerners come in droves to escape that.

## NOAA Ranks December Snowstorm a Category 3 on the Northeast Snowfall Impact Scale

Monday, January 25, 2010, 12:00:00 AM

To the surprise of no one affected by the Dec. 18-20, 2009 system that dumped heavy snow from the mid-Atlantic to southern New England, NOAA has rated the storm a Category 3 or "Major" winter storm on NOAA's Northeast Snowfall Impact Scale, also known as NESIS. NESIS characterizes and ranks Northeast snowstorms, using data calculated by NOAA's National Climatic Data Center, based on the following factors: how much snow falls (must deposit at least 10 inches); the scale of the area impacted; and the population of the impacted area. NESIS ranks these storms on a five-tier scale ranging from Category 1 "Notable" to Category 5 "Extreme."

# After US December blizzards and early January Freezes, Europe Descended into Deep Freeze, Coldest in China since 1971

Monday, January 18, 2010, 12:00:00 AM

After US December blizzards and early January Freezes, Europe Descended into Deep Freeze, Coldest in China since 1971. Early January was very cold in the Plains and southeast with lows in the minus 30s in the plains and below freezing in Florida well south. It even dropped to the upper 30s (4C) in Cuba!! Last February (2009), temperatures dropped in westernmost Pinar del Rio province to 4.9 degrees Celsius.

Meteorologists say this is a record low for the month of February. The coldest temperature register in that region ever was of 3.9 degrees Celsius on January 28, 1986.

### El Nino Continues Stormy, Atypically Cold

Monday, January 11, 2010, 12:00:00 AM

In the Pacific we are battling between a moderate El Nino but with the warmth displaced more towards the central tropical Pacific with cold water off the South American coast and a negative PDO pattern which mimics La Nina patterns and keeps Pacific air entering western North America colder. The result has been colder weather than in a typical El Nino. This year the cold north Pacific water extends to the waters northwest of Hawaii where it was found in some of the colder El Ninos as in 1976/77.

# **Snow and Cold in United States And Europe Linked By Arctic Pattern - More to Come**

Monday, January 04, 2010, 12:00:00 AM

Both the United States and Europe have seen some extreme cold and heavy snows this month. This is no coincidence as it is very often similar in Europe and the United States. In fact you can often add eastern Asia to the winter trifecta. The reason is that there are often 4 major waves around the hemisphere. When a major trough is positioned in the eastern United States, other troughs are often found in Western Europe, Eastern Asia and near the dateline in the Pacific. That has been the case. Indeed Eastern Asia has had Siberian blasts this month.

## Blockbuster East Coast Storm of December 19-20, 2009-12-20

Monday, December 28, 2009, 12:00:00 AM

The storm approached New England on the cusp of the winter solstice, having already caused flooding in South Florida and knocked out electricity for more than 85,000 customers in the Carolinas on Friday. On Saturday, it dropped 16 inches of snow on Reagan National Airport outside Washington - the most ever recorded there for a single December day since snowfall records began in 1884. The storm total snowfall of 16.4 inches of snowfall on Decmber 18-19, 2009 marks the 6th highest two-day snowfall record for Washington, DC, putting it just below the president/s day storm in 2003 and ahead of the January 1996 storm. For the month so far...a total of 16.6 inches of snow has been recorded at DCA. This makes it the snowiest December on record for Washington DC (previous record was 16.2 in 1962).

### **Mid-December Update**

Monday, December 21, 2009, 12:00:00 AM

El Nino continues towards it peak (this month or next) as the Kelvin wave triggered by good wind westerly bursts last few months comes east, lowering the thermocline and causing sea level rises (like sloshing water in your bathtub). It should peak in upcoming few weeks and then begin to subside. All dynamical and statistical models available as of mid November suggest this. The median forecast puts it on the upper end of the middle range of moderate El Ninos at least in terms of NINO region 34 temperatures. Eastern areas are less warm.

# Temperature Adjustments by National and Global Data Centers

Monday, December 14, 2009, 12:00:00 AM

NOAA's United States Historical Climate Network, USHCN was first established in 1990. First version had a UHI adjustment based on the work of Karl (who used the work of Oke and Landsberg among others). But lack of warming since 1940 was an inconvenient fact they had to explain away with US being a special case and only 19% of the global data. That didn't sit well with some folks so in 1999, NCDC began a slow backing off of the surface UHI and in 2007, eliminated the urban heat island with the results below. These are NASA GISS plots of the USHCN network. Fortunately thanks to the late John Daly we have the earlier version from 1999 as plotted by NASA GISS to compare with. They have the current version as well. Note the significant changes made with cooling of the earlier 20th century warm period and a warming of the late 20th century ocean and solar driven cyclical peak.

## Critique of Bogus NCAR Cherry Picking Temperature Record Study

Monday, December 07, 2009, 12:00:00 AM

The NCAR [National Center for Atmospheric Research] study titled "The relative increase of record high maximum temperatures compared to record low minimum temperatures in the U.S." was published October 19, 2009." The current observed value of the ratio of daily record high maximum temperatures to record low minimum temperatures averaged across the U.S. is about two to one. This is because records that were declining uniformly earlier in the 20th century following a decay proportional to 1/n (n being the number of years since the beginning of record keeping) have been declining less slowly for record highs than record lows since the late 1970s.

### **Record Snow Pacific Northwest and China**

Monday, November 30, 2009, 12:00:00 AM

Whistler Blackcomb ski resort has reported 98" the last seven days and 165" November. This makes it the snowiest November on Record at Whistler Blackcomb. "I've skied here for over 15 years and I've never seen this much snow so early in a season, it seems like every day's snowfall is topping the last," said Stephen Butt, communications coordinator

and voice of the Snow Phone for Whistler Blackcomb told the Vancouver Sun. "We have already received one third of our average annual snowfall for the entire season and it's only four days into the season, it's unbelievable!"

## Stratospheric Warming Beginning – if it persists, suggests cold coming end of November and December US and Europe

Monday, November 23, 2009, 12:00:00 AM

Below is a cross section of height/temperature anomalies for the Polar Regions (65-90N). Note each time the warming reached into the mid Troposphere, the AO Index tanked. The negative AO was why October was 3rd coldest in 115 years for the United States. It has retreated to higher levels and the AO has recovered for the time being. That is why the US turned warmer this month.

### **Extreme October, Year (and Upcoming Winter?)**

Monday, November 16, 2009, 12:00:00 AM

October state by state data is in and we see virtually the whole country ended up below normal (only warm state was Florida) with an average US temperature an amazing close to 4F below the normal. October with a mean of 50.8F was behind only 1976 with 50.7F and 1925 with 49.4F. It has been persistently cold across the northern tier over much of the past 12 months.

# **Dalton like Solar Minimum - Back to the Age of Dickens?**

Monday, November 09, 2009, 12:00:00 AM

If your idea of Christmas is mince pies, sleigh-bells in the snow, and a family feast round a roaring fire, then you're dreaming of a Dickensian Christmas. For all the elements of what we now think of a traditional Old English Yuletide were largely the invention of that greatest of English writers, Charles Dickens, in his 1847 masterpiece A Christmas Carol. Well the Climate is now moving into a new regime that may bring us back to the climate of the Dickens era, the so called Dalton Minimum (1790-1830). Last winter, London had its first October snow in 70 years and more snow in December, January and February. Bitter cold weather accompanied the snow for weeks at a time.

### **Enso Update**

Monday, November 02, 2009, 12:00:00 AM

El Nino had diminished since its July peak. Water cooled in the eastern Pacific. But a new pool of warm water has built in the central Pacific as a westerly wind burst and a

strong dip in the SOI pushed a Kelvin wave east along the thermocline and downwelled warmer water from near the surface.

# **Hurricane Season a Dud in the Atlantic and Globally Lowest in at Least 30 Years**

Sunday, October 25, 2009, 11:00:00 PM

Despite a recent more normal flurry in activity in the tropical Pacific, the global activity continues its multi-year decline. Atlantic temperatures affect the frequency and strength of Atlantic tropical activity. Atlantic temperatures undergo a cyclical warming and cooling with a period of about 70 years (indicated by the Atlantic Multidecadal Oscillation or AMO). The warming in 1995 saw an immediate pop in the number of storms. That warming and activity peaked in 2004 and 2005 the years of the very active hurricane seasons.

### Fire and Ice (and ENSO)

Sunday, October 18, 2009, 11:00:00 PM

This week we will do an update on the solar, the polar ice and ENSO. SOLAR CYCLES 23 AND 24 After a spotless August, a pair of sunspot groups in September led to a monthly sunspot for September of 4.5. After passing off the visible solar disk early on the first, October has returned to spotless conditions again the last week. 2009 continues to climb up the list of most spotless day years now in 12th place since 1849. We are likely to challenge or even surpass 2008's 4th place total of 266 days. Note 2007 also made the top 20 in 20th place with 163 spotless days.

### **Weather and Your Health**

Sunday, October 11, 2009, 11:00:00 PM

Since ancient times, people have made a connection between weather and health. Hippocrates first wrote about the affect of hot and cold winds on people and the possible connection between epidemics and weather conditions in 400 BC. These ideas were further developed by herbalists in the Middle Ages, who prescribed specific plants for use during the different winds. Many of these ideas were discarded as "folk medicine" with the rise of empirical science, and lacking in scientific basis. Centuries later, medical science began a series of experiments that led to a revived interest in the connection between weather and health.

# The Real Green Revolution and the Great Man Behind It

Sunday, October 04, 2009, 11:00:00 PM

Renowned agricultural scientist Dr. Norman Borlaug has died at the age of 95. Borlaug, known as the father of the "Green Revolution" for saving over a billion people from starvation by utilizing pioneering high yield farming techniques, is one of only five people in history who has been awarded a Nobel Peace Prize, the Presidential Medal of Freedom, and the Congressional Gold Medal.

### **El Nino Comparisons - Some Thoughts on Winter**

Sunday, September 27, 2009, 11:00:00 PM

This El Nino is still taking shape and looking like a weak to at most a moderate event. Note the September 20th 5-day cross section here. These cross sections show you the temperatures and temperature anomalies with depth across the equatorial tropical Pacific from west (140E) to east (100W) derived from TAO Triton buoys. Eastern areas have suffered from data dropout from vandalism.

### Ice Melt Season Shows Another Increase in Extent

Sunday, September 20, 2009, 11:00:00 PM

The arctic ice which bottomed out in 2007, has been bouncing back nicely the last two years. In fact the daily plots show the ice extent at the minimum this month was 23.4% greater than in 2007. Arctic ice changes are not new, there was a similar dip in the warmer 1930s-early 1950s period and according to Russian oceanographers in the 1800s. These predictable drops are due to natural factors including the sun, volcanic activity, ocean temperatures in the Atlantic and Pacific and the summer wind flow patterns, many of which are interrelated.

# California's Fires Result of a Cooling Pacific, Two Years of La Nina and Environmental Mismanagement

Sunday, September 13, 2009, 11:00:00 PM

As is true most years in the early fall, we hear stories about western wildfires. This year, the worst have been in California, in one case the station fire, one the largest ever observed. The hills are ablaze as can be seen in the following pictures. The first is from the JPL laboratories in Pasadena.

## **Solar Changes and the Climate**

Sunday, September 06, 2009, 11:00:00 PM

In space.com this week, they reported on an important new paper in Science "Meehl, G.A., J.M. Arblaster, K. Matthes, F. Sassi, and H. van Loon (2009), Amplifying the Pacific climate system response to a small 11 year solar cycle forcing, Science, 325, 1114-1118." Weather patterns across the globe are partly affected by connections between the 11-year solar cycle of activity, Earth's stratosphere and the tropical Pacific Ocean, a new study finds.

## **Hurricane Season Finally Kicks Into Gear**

Sunday, August 30, 2009, 11:00:00 PM

Hurricane Bill, reached Category 4 not once but twice as it swung northwest and north precariously close to the coastline. The overall environment with a warm Atlantic Multidecadal Oscillation (AMO) and cold Pacific Decadal Oscillation (PDO) are conducive for storms threatening Florida and the east coast, however, the weak to moderate El Nino is not.

### **The Beat Goes On**

Sunday, August 23, 2009, 11:00:00 PM

The sun through Mid August continues to surprise is its Sleeping Beauty mode. Three dozen straight days without a sunspot, 178 for the year to date, 78% of the days. 2009 with 4 and ½ months to go, already was rising through the top twenty spotless years since 1850 and should rival 2008 with its 265 spotless days for a top 5 position. The only other three year stretch that made the top twenty was the 1911, 1912, 1913 period.

### **Climate Cycles - Long and Short**

Sunday, August 16, 2009, 11:00:00 PM

Climate change is real - the only constant in nature is change. Historically our planet has undergone periods of great fluctuations with massive glaciations and then widespread warmth.

# Big Apple's Cold Summer - Record Cold July in Many Areas

Sunday, August 09, 2009, 11:00:00 PM

Many cities in the east and central will be reporting top 5 or ten coolest June and July periods in the next few days and we will summarize them. Here is one – New York City's Central Park.

### **Volcanic Eruptions**

Sunday, August 02, 2009, 11:00:00 PM

As we have in recent stories, noted that high latitude volcanoes produce this summer cooling over the United States by favoring higher latitude blocking.

## **Heat Waves - Are They Becoming More Common?**

Sunday, July 26, 2009, 11:00:00 PM

It has been a typical post La Nina hot late spring and summer in the southern plains and across the Deep South. Recently the heat built back into the Intermountain West and even the Northwest but the first half of summer has been unusually cool from the north central across the Midwest and Great Lakes to the Northeast, with some locations the first half of meteorological summer averaging 5F or more below normal. Although a warmer, more seasonably humid and wet early end of July is likely in the east as the Bermuda high presses inland, it will not last and in the end it will not be remembered as a hot summer. Indeed, in many areas, it may be remembered as "a year without a summer."

### El Nino Now Official - Now What?

Sunday, July 19, 2009, 11:00:00 PM

El Nino criteria has been met. Now the meteorological world looks to see how strong and how long this lasts. Count on CPC and other forecast centers to go for a warm winter as a result of El Nino but as we have shown, there are differences in El Ninos depending on the overall mode in the Pacific Basin (the PDO).

### **Some Documented Solar Influences on Weather**

Sunday, July 12, 2009, 11:00:00 PM

In a number of posts this last year, we have addressed the unusually long and quiet solar cycles. A few weeks back, we noted the sunspot minimum seemed at hand as the month of June started with a series of cycle 24 sunspots and it appeared we would exceed the monthly sunspot number of 3.3 necessary to make the sunspot minimum (the lowest value in 13 month average) November 2008.

### June - A Month of Extremes

Sunday, July 05, 2009, 11:00:00 PM

Last week we wrote about the ring of fire ridge in the south central with heat ringed by thunderstorms west and north and east. The ridge was backing up some towards the intermountain by months end and temperature were cooling in all but the south central. Around the south central warm ridge, colder than normal temperatures were found in the west, north and east much of the month and ended up well below the normal.

## **Ring of Fire Thunderstorms**

Sunday, June 28, 2009, 11:00:00 PM

In the late spring and summer, when a heat ridge builds in the atmosphere, there is often a concentration of strong thunderstorm clusters that rapidly rotate around the ridge. They feed off the heat in the ridge where subsidence caps convection. North of the ridge even weak disturbances in the flow can kick off thunderstorms that can organize into large clusters. They often produce heavy rains, hail, very strong winds and tornadoes.

## El Nino in a Cold PDO – Are they Different?

Sunday, June 21, 2009, 11:00:00 PM

Warming is taking place again this year in the eastern tropical Pacific. Recently the SOI spiked 5 STD negative indicative of that trend towards El Nino.

### **Sunspot Minimum Finally**

Sunday, June 14, 2009, 11:00:00 PM

We have been reporting on the unusually quiet sun and ultralong solar cycle over the last year. The sun has become more active in early June with cycles 24 spots in middle latitudes. See sunspot group number 11019 for group of red spots. This is slightly diminished since yesterday. The dark green areas are coronal holes out of which the solar wind escapes at higher velocity.

# South Central Canada Has a Frigid May after a Cold Winter

Sunday, June 07, 2009, 11:00:00 PM

May has been frigid slowing the planting and emergence of the summer crops in the southern prairies of central Canada. Late freezes and even snows occurred in central Canada through the entire month right up to the last day.

### What's Up With Sea Levels?

Sunday, May 31, 2009, 11:00:00 PM

Sea levels have been rising since the Little Ice Age. Sea level rose 8 inches in the 20th century. The IPCC in 2007 predicted a rise between 7.5 inches and 23 inches in the 21st century.

# Another Active Tornado Season But So Far Not as Bad as 2008

Sunday, May 24, 2009, 11:00:00 PM

After another La Nina season with again a lot of snow and precipitation in the north central, another active tornado season was expected and so far it has delivered on that promise. However given the La Nina was not as strong and the rebound in the Pacific towards El Nino is a month earlier than last year, the number of storms so far, have been less. Unless major outbreaks occur in late May, it looks like May will fall well short of last May's 461 tornadoes.

### Redoubt, a Quiet Sun and Your Morning Coffee

Sunday, May 17, 2009, 11:00:00 PM

In recent months we have posted stories on the continuing unprecedented (in our lifetime) quiet sun and the eruptions of Alaska's Mt. Redoubt. Believe it or no both may be having an effect on the cost of coffee in the months ahead.

### **Arctic and Antarctic Update as of Early May**

Sunday, May 10, 2009, 11:00:00 PM

The arctic has recovered from the 2007 minimum the last two years. This can be seen from the University of Illinois Cryosphere. As of early May the value was actually the highest for the date in the 8 years since 2002, we have monitored it with the AMSR-E satellite sensors.

### **Thoughts on Summer 2009**

Sunday, May 03, 2009, 11:00:00 PM

In looking the summer, we usually focus on factors like ENSO state and strength, levels of solar activity, the modulation of both by the Quasi-biennial Oscillation (QBO), the multidecadal ocean cycles (PDO and AMO), volcanic activity and antecedent conditions, primarily soil moisture.

## **ENSO Update and Other Matters**

Sunday, April 26, 2009, 11:00:00 PM

The second year La Nina appears to be coming to an end. There is uncertainty as to whether we bounce to a weak El Nino or just neutralize before returning to La Nina which is favored near solar minima. There were two El Ninos near solar minima in the last 60 years that were brief and weak and were surrounded by La Ninas, which tend to dominate near minima.

### **VORTEX2 - Super Storm Chaser Data Project**

Sunday, April 19, 2009, 11:00:00 PM

An unprecedented \$10.5 million dollar effort to understand tornadoes will send dozens of scientists into the field May 10 to June 13. Verification Of Rotation in Tornadoes EXperiment 2 (VORTEX2) is funded by the National Science Foundation (NSF) and the National Oceanic and Atmospheric Administration (NOAA).

# All-time Snow Records Tumbling Again for the Second Straight Year

Sunday, April 12, 2009, 11:00:00 PM

Last year Colorado, Wyoming, Wisconsin, Michigan and northern New England into southern Canada were areas where the all-time snow records fell. This year they were further north and west in Washington, North Dakota, and Minnesota with North Dakota ground zero.

# Mt. Redoubt Eruptions – What Effect If Any on the Summer? Winter?

Sunday, April 05, 2009, 11:00:00 PM

Starting on March 22, a series of major eruptions have taken place from Mt. Redoubt in Alaska. The biggest exceeded 65,000 feet in height. More than a dozen eruptions as high as 60,000 have followed the first week alone. Activity may continue for weeks or months based on the volcano's history.

### **United States and Global Data Integrity Issues**

Sunday, March 29, 2009, 11:00:00 PM

Issues with the United States and especially the global data bases make them inadequate to use for trend analysis and thus any important policy decisions based on climate change. These issues include inadequate adjustments for urban data, bad instrument siting, use of instruments with proven biases that are not adjusted for, major global station dropout, an increase in missing monthly data and questionable adjustment practices.

### Looking Back at 2008 and the Winter of 2008/09

Sunday, March 22, 2009, 11:00:00 PM

The University of Alabama MSU satellite based lower atmospheric temperatures for 2008 were the lowest in the 21st century and 14 coldest in the 30 years of record keeping. NOAA and UK Hadley's ranking of 2008 as the 8-10th warmest in the last 114 to 149 years is nonsense as that data is not adjusted for urbanization and suffers from major station dropout, a tenfold increase in missing months, poor siting, instrument biases not adjusted for and then bad algorithms.

# **Monthly AMO Drops Negative, Will It Persist, What** Will It Mean?

Sunday, March 15, 2009, 11:00:00 PM

The AMO has been in decline since peaking in late 2003-2005. Normally the warm and cold phases of the AMO each last roughly three decades. It appeared the last warm phase tried to get going in 1988 but Pinatubo put a damper on the warming delaying it till 1995. If 1988 is the real starting point, then it should last until 2018.

### **Sun Continues Hibernation**

Sunday, March 08, 2009, 11:00:00 PM

The sun continues in hibernation mode. NASA and others thought in late 2006 it had bottomed out but it has continued to slide. Since it can't go negative, it has leveled off scraping the bottom of the chart. The NASA team projections for the next cycle continue to slip further into the future and periodically adjusted down. They present two scenarios one for a more active cycle (24) with a peak at the start of 2012 and the second a weaker one peaking around the end of 2012 or start of 2013.

### <u>Tornado Season Starts – Another Active One?</u>

Monday, March 02, 2009, 12:00:00 AM

Tornadoes have been in the news in recent weeks in places like Oklahoma and Georgia. They mark the start of the spring severe weather season. This year should again be more active than recent decades, given less snowcover in the north and a weaker La Nina, the number of storms is likely to fall short of 2008.

#### Summer 2009 - An Early Look

Monday, February 23, 2009, 12:00:00 AM

The winter still is going through its last grand finale. We are however starting to look ahead to the summer. Mt. Redoubt may play a role should it blow soon, as that tends to produce a cooler summer. But for now let's assume it doesn't and see what ENSO and other teleconnections tell us.

# Super Strong Stratospheric Mid-Winter Warming Event to Bring Extremes of Cold and Snow as Grand Finale to Winter 08/09

Monday, February 16, 2009, 12:00:00 AM

It has been a top ten coldest winter for the first two months of the year in parts of the central states. After a bit of a roller coaster ride with even a warm day or two (first in many weeks) last week a major stratospheric warming event that began last month is translating down to the mid and lower atmosphere with developing high latitude blocking high pressure. These warmings then cause the cold air to dump to mid-latitudes and dominate for usually 30 days or more.

# Taking a Time Machine Ride Back to the 1960s or 1800s?

Monday, February 09, 2009, 12:00:00 AM

There are signs our weather is taking a time machine ride back to the regimes of the 1960s or even the late 1700s early 1800s. Our climate operates in cycles, which favors different regimes of weather. We have come out of a few decades that thanks to a warm Pacific resulted in a dominance of El Ninos and its typical southern storm tracks and warm, dry western North America.

## Florida Freeze an Interesting Mesoscale and Ag Forecast Case Study

Monday, February 02, 2009, 12:00:00 AM

The Freeze on Wednesday and Thursday, January 21-22, 2009 was a very interesting case of several mesoscale local factors at work.

### **Cold Breaks Loose and Breaks All-time Records**

Monday, January 26, 2009, 12:00:00 AM

For three weeks record cold gripped Alaska and Northwest Canada. It finally let lose mid-month and plunged into the lower 48 states. And it made a heck of an impact.

### **Inauguration Weather**

Monday, January 19, 2009, 12:00:00 AM

Presidential Inaugurations first went outdoors with the inauguration of James Monroe in 1817. A wide variety of weather conditions occurred over the years including the extreme and even tragic with William Henry Harrison catching pneumonia and dying a month later.

## 2008 Ends Spotless and with 266 Spotless Days, the #2 Least Active Year Since 1901, With Cooling Oceans, It Portends Cooling

Monday, January 12, 2009, 12:00:00 AM

2008 ended with another spotless day bringing the total number of sunspotless days for December to 28 and for the year to 266, clearly enough to make 2008, the second least active solar year since 1901.

## Madison and Green Bay Wisconsin Sets December Snowfall Records, All-Month Record

Monday, January 05, 2009, 12:00:00 AM

With about three months to go in the winter of 2008-09, Madison could end up with the average total amount of snow for a season already before the calendar is flipped to the new year.

### La Nina Part II

Monday, December 29, 2008, 12:00:00 AM

Last winter, we experienced a La Nina, strongest since 1988. Most strong La Ninas are multi-year events especially during the cold Pacific Decadal Oscillation stages as we had from 1947-1977 (and again after 1998)

# **Snow Continues to Fall in Unusal Places and the Northeast Ice Storm**

Monday, December 22, 2008, 12:00:00 AM

As we reported in our first post this series, the last few years has seen snow fall in unusual places like Buenos Aires, Johannesburg, South Africa, Southern Australia, Southern China, Iraq, Saudi Arabia, Jordon, Jerusalem and Greece.

## <u>Cold Sun – Cold Earth: 2008 Now #3 Most Sunspotless</u> Days in the Last 100 Years – Could We Reach #2?

Monday, December 15, 2008, 12:00:00 AM

As of December 7, we have had 245 spotless days in 2008, enough to put us 3rd place ahead of 1954 this past century. It extended the latest string of sunspotless days to 20 days, 7 this month. If we match November's 16 spotless days in December, we will move into second place ahead of 1912 (253 spotless days) behind just 1913 (311 days).

### Alaskan Cold and Glacial Advance Due to PDO

Monday, December 08, 2008, 12:00:00 AM

The PDO not Greenhouse Gasses are responsible for changes in Alaska. The PDO has a major influence on Alaskan and for that matter global temperatures. The positive phase favors more El Ninos and a stronger Aleutian low and warm water in the north Pacific off the Alaskan coast. The negative phase more La Ninas and cold eastern Gulf of Alaska waters.

### **Do Early Cold Winters Typically Reverse Midwinter?**

Monday, December 01, 2008, 12:00:00 AM

Given the cold late November and early December start, the question most forecasters are wrestling with is whether the late winter will see a reversal to warmth (those that see it are projecting to either late December or late January). We have indicated that warming

would be a virtual certainty if a stronger La Nina returned because La Ninas with a westerly QBO (the case this winter) were quite warm in the east and central (most notably 1973/74, 1975/76).

### **Explosive Development in East Coast Cyclones**

Monday, November 24, 2008, 12:00:00 AM

East coast cyclones in winter can produce prodigious snowfalls burying the major cities of the east. They come in different flavors – as waves along fronts offshore or as storms that develop secondary to inland lows.

### **Another Cold December to March for Many Locations**

Monday, November 17, 2008, 12:00:00 AM

La Nina is gradually returning. The Multivariate ENSO Index (MEI) has dropped to -0.74 in October, well into weak La Nina territory. The tropical Pacific sea surface temperatures all the way from South America to beyond the dateline are back below normal. The North Pacific as a whole remains strongly in the cold mode (negative PDO).

### Two Major Snowstorms from the 2007/08 Winter

Monday, November 10, 2008, 12:00:00 AM

A major winter storm impacted south-central and southeast Wisconsin on February 5-6, 2008. This was a long duration event coupled with strong gusty winds and some thunder. Blowing and drifting snow compounded the effects of the heavy snow. Total new snow accumulations in excess of 12 inches occurred in the area southeast of a line from Dubuque, Iowa to Madison to Beaver Dam to West Bend to Sheboygan. Up to 16 inches fell in the area from Monroe and Janesville to the Port Washington and Milwaukee area...with isolated 18 to 21 amounts reported.

### **Polar Ice Increasing Rapidly**

Monday, November 03, 2008, 12:00:00 AM

Despite predictions that after the 2007 record minimum ice cover, that this past summer would likely see a new record, given the amount of first year ice, we fell short by about 9% of a new record.

### Two Memorable Recent Blizzards

Sunday, October 26, 2008, 11:00:00 PM

We will start this week with the two premier storms affecting the northeast ranked number 1 and 2 on the Northeast Storm Impact list compiled by Paul Kocin and Lou Uccellini in their AMS monograph on Northeast Snowstorms.

### **Pacific Decadal Oscillations Closely Tied to ENSO**

Sunday, October 19, 2008, 11:00:00 PM

The PDO continues to be strongly negative and the ENSO measures are trending back towards La Nina. Should that surprise us? No, because most La Ninas have a tendency to persist more than one year and the negative PDO states favors more and stronger and longer lasting La Ninas.

### **Cloudy Coolish Summer Related to Slumbering Sun?**

Sunday, October 12, 2008, 11:00:00 PM

Many people from Alaska to the northern United States, Canada and northern Europe have complained about cool and cloudy and wet summer. Let's take just two examples.

### **Solar Winds and Cycle 24 Update**

Sunday, October 05, 2008, 11:00:00 PM

In an earlier story in late May, we discussed how the current ultra-long solar cycle may have major implications on the direction of climate. Solar activity has continued to be at very low levels the last four months, in fact by some accounts (some observatories), August was the first spotless month since 1913 (there have been a few 30 day intervals without sunspots as recently as 1954 but they have crossed months).

# Snowfall Anomalies in Recent Decades - Driven in Part by Multidecadal Ocean Cycles

Sunday, September 28, 2008, 11:00:00 PM

The 1990s and early 2000s had some very interesting snow years with the focus shifting around the country in response to changes in the oceans. 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.

### **Urban Heat Island**

Sunday, September 21, 2008, 11:00:00 PM

We are all familiar with the fact that cities are generally warmer than the surrounding, more rural areas. We see it referenced most nights in our television weather reports. It is especially significant on nights with clear skies and light winds which favor radiational cooling. This is most significant in the rural areas but in the city, the excess heat absorbed during the day and the local heat sources maintain higher nighttime readings. During the days or nights with strong winds and clouds the differences are minimized due to mixing and the advective cooling of the city by the winds.

### A Very Typical La Nina Year

Sunday, September 14, 2008, 11:00:00 PM

Early this year in several stories we wrote about what La Ninas and a negative PDO mean for our weather. So far every one of the typical characteristics have been seen.

### First Spotless Month Since 1913 - Possible Implications

Sunday, September 07, 2008, 11:00:00 PM

The Sun is a variable star with changes in levels of activity including brightness and eruptive activity that varies on periods of 11, 22, 53, 88, 106, 213, and 429 years. During these 'cycles' the sun varies in its brightness (for the 11 year about 0.1%, for the longer term 0.3-0.5%). The ultraviolet radiation in the spectrum changes 5 to 8 times greater.

### Where is ENSO Likely to Go?

Sunday, August 31, 2008, 11:00:00 PM

How do the ENSO models look for the upcoming winter? Here is a compilation from IRI of 23 statistical and dynamical ENSO models updated this month. Most remain in the -0.5 to +0.75 MEI range for the winter DJF (neutral to weak El Nino).

### The Threat To New England

Sunday, August 24, 2008, 11:00:00 PM

Last week we discussed why the east coast was at increased risk and what might happen if a CAT3 storm like 1938 repeated or, worse yet, came closer to New York City. Another area in the northeast at special risk is southeastern New England. The bays are open to the south almost inviting a storm surge. Major surges occurred in both 1938 and 1954 with Hurricane Carol. Buzzards Bay and Cape Cod were actually hit hardest in Carol, which tracked east of the 1938 storm.

# <u>Is the New York City Metro Area Vulnerable This Hurricane Season?</u>

Sunday, August 17, 2008, 11:00:00 PM

Since 1995, the Atlantic has become twice as active on average as the prior 25 years, similar to the period from 1930s to 1960s. This is due to a shift to the 'warm' mode of the multi-decadal scale oscillation in the Atlantic Ocean Most of the storms making landfall during the past 12 years have impacted the Mid-Atlantic region, Florida and the Gulf of Mexico. However, though not yet realized, history tells us that the risk has also increased for more populated areas to the north New York City/(Long Island and New England).

### **Recent Cooling and the Serious Global Database Issue**

Sunday, August 10, 2008, 11:00:00 PM

All the global data sources have updated for June. NOAA GHCN data was a clear outlier. NOAA called this the eighth warmest June on record for the globe in the 129 years since records began in 1880. The University of Alabama, Huntsville MSU satellite based global assessment reported the 22nd warmest in the 30 years of records in their data base (in other words the 9th coldest).

# Active Winter and Spring Showed High Degree of Persistence

Sunday, August 03, 2008, 11:00:00 PM

The winter and spring showed a great deal of persistence which is why anomalies were so large. Persistence tends to be high during stronger La Ninas and El Ninas as we have reported earlier.

### **Comparing ENSO Measures**

Sunday, July 27, 2008, 11:00:00 PM

We have just come off a strong La Nina and are back in a neutral ENSO state. I have been asked by some of you to discuss what measures are used to determine ENSO state and strength. There are three primary measures, one official.

### **The Madden Julian Oscillation**

Sunday, July 20, 2008, 11:00:00 PM

Tropical rainfall also exhibits strong variability on sub-seasonal time scales. These fluctuations in tropical rainfall often go through an entire cycle in 30-60 days, and are referred to as "intraseasonal oscillations" or the "Madden-Julian Oscillation" or "MJO".

## <u>Central Park Temperatures - Three (Four?) Radically</u> Different Official Versions

Sunday, July 13, 2008, 11:00:00 PM

Our national centers regard station data as critical to measure recent climate change. The raw observations are taken from the stations then adjusted to account for local factors like site changes, changes in instrumentation, time of observation and in some cases urbanization (Karl 1988). One would think the differences would be small and that once adjusted, the data would stand the test of time.

# **Strong La Nina Behind The Rough Winter And Spring In The Central!**

Sunday, July 06, 2008, 11:00:00 PM

Strong El Ninos and La Ninas produce the greatest anomalies, in part because they tend to cause patterns to persist to a large degree. In an average, weak non ENSO (La Nada), there is enough week-to-week and month-to-month variability to allow warm to better balance cold and wet dry. In strong ENSOs, the patterns get "stuck", so the wet areas stay wet, dry areas dry, cold areas cold, warm areas warm and anomalies build and persist.

### **The September Surprise - The Great Hurricane of '38**

Sunday, June 29, 2008, 11:00:00 PM

The year is 1938. Another hot Dust Bowl summer is drawing to a close. The heat has not been as extreme this summer as in some of the prior summers this decade, but it still has been hot, by most all accounts, too hot. The hurricane season is well underway. This one has been uneventful...so far.

### 1930s Dustbowl Still Dominates Heat Records

Sunday, June 22, 2008, 11:00:00 PM

After a spring that ended the 36th coolest in 114 years and for many areas of the central areas one of the wettest, many are wishing for more warmth and dryness. Two weeks ago, we did a story on how soil moisture conditions in the spring usually persist through the following summer and affect temperatures. This year that should mean heat will be limited in the wet areas of the central and likely more persistent over drought areas well to the south and west.

### Similarities to 1993 Flooding

Sunday, June 15, 2008, 11:00:00 PM

From May through September of 1993, major and/or record flooding occurred across North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, and Illinois. Fifty flood deaths occurred, and damages approached \$15 billion. The magnitude and severity of this flood event was simply over-whelming, and it ranks as one of the greatest natural disasters ever to hit the United States.

### **Soil Moisture and Summer Temperatures**

Sunday, June 08, 2008, 11:00:00 PM

There is a relationship between soil moisture and both precipitation and temperatures that becomes important in the spring and summer months. Forecasters pay close attention to this factor in their forecasts for summer. Soil moisture anomalies of significance tend to

persist from spring to summer, except when major events like a landfalling hurricane act to intervene.

### La Nina Tornado Season Continues to Roll On

Sunday, June 01, 2008, 11:00:00 PM

Major tornado outbreaks occurred in January 1999, a recent La Nina year, in Arkansas and Tennessee and in May in Oklahoma and Kansas with \$2.3 billion in damages. The biggest outbreaks were decades ago in earlier La Nina seasons. The super outbreak of April 1974 with its 148 tornadoes that left 315 dead and 500 injured occurred during a very strong La Nina.

### **Ultralong Solar Cycle 23 and Possible Consequences**

Sunday, May 25, 2008, 11:00:00 PM

Sunspots appear as dark spots on the surface of the Sun. Temperatures in the dark centers of sunspots drop to about 3700 K (compared to 5700 K for the surrounding photosphere). They typically last for several days, although very large ones may live for several weeks. Sunspots are magnetic regions on the Sun with magnetic field strengths thousands of times stronger than the Earth's magnetic field.

### **Ocean Oscillations and Hurricanes**

Sunday, May 18, 2008, 11:00:00 PM

The activity in the Atlantic Basin during hurricane season is influenced by sea surface temperature patterns in both oceans. In recent weeks we have posted stories about the Pacific Decadal Oscillation and the Atlantic Multidecadal Oscillation. Both factors influence the relative frequency of storms, the number of strong storms and the most likely storm tracks and areas affected.

# **Multidecadal Ocean Cycles and Greenland and the Arctic**

Sunday, May 11, 2008, 11:00:00 PM

In early May, a paper appeared in Nature that created quite stir in the media by showing how by including long term ocean cycles in models the recent global cooling or at least lack of warming may continue to 2020. The same week, a story by NASA's Earth Observatory reported on the flip of the Pacific Decadal Oscillation to its cool mode.

### The Atlantic Multidecadal Oscillation

Sunday, May 04, 2008, 11:00:00 PM

Last week, we discussed the Pacific decadal Oscillation (PDO) and its impact on the frequency of El Ninos and La Ninas, which have an effect on the position of global troughs and ridges and through them global patterns of temperatures and precipitation.

The Atlantic also has a multidecadal oscillation called the Atlantic Multidecadal Oscillation or AMO which has a period of about 30 to 35 years per phase (a cycle length of around 70 years).

# The Relationship of the PDO to El Nino and La Nina Frequency

Sunday, April 27, 2008, 11:00:00 PM

John McLean reported Australia's CSIRO and Bureau of Meteorology (Power and Smith 2007) wrote about a period of unprecedented El Niño dominance the last 30 years, which they blamed on human activity. Vecchi (2006, 2007) speculated there was a just 1% probability that this was due to natural events.

### **How Volcanism Affects Climate**

Sunday, April 20, 2008, 11:00:00 PM

Climatologists may disagree on how much the recent global warming is natural or manmade but there is general agreement that volcanism constitutes a wildcard in climate, producing significant global scale cooling for at least a few years following a major eruption.

# **Would You Believe La Ninas Often Hurt the Economy More Than El Ninos?**

Sunday, April 13, 2008, 11:00:00 PM

You may remember, in the 1980s and 1990s, before the media's favorite weather topic was climate change or global warming, it was all El Nino. It was blamed for virtually any weather event that occurred in El Nino years. It is true that El Ninos when strong are capable of producing losses that can total in the billions of dollars.

### **Snow World - What a Year for Snow in Unusual Places**

Sunday, April 06, 2008, 11:00:00 PM

A rare winter snowstorm dusted South Africa's commercial capital Johannesburg early on Wednesday June 26 closing mountain passes and claiming at least one life. 'SNOWBURG' trumpeted the headline of Johannesburg's Star newspaper. Gleeful children built snowmen in Johannesburg's Zoo Lake Park, while families could be seen carrying snowballs back to their cars, fast melting souvenirs of the city's first significant snowfall, the first real snowfall in more than a generation.