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BROWNING NEWSLETTER

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IT'S BAAAACK – LA NIÑA or WHY TEXAS IS STILL DRY

IN THIS ISSUE

- The La Niña has returned. This will be the second La Niña winter in a row. This means there will be another cold winter in the Northern Hemisphere. It also will create floods and droughts for Southern Hemispheric nations during their growing seasons.
- The early arrival of the La Niña means little to no drought relief for Texas but fewer tropical storms hitting the East Coast.
- There is a high probability that late fall, winter and early spring will be as extreme in Europe, North and South America as it was last winter. In Asia, the Indian Ocean Dipole has changed – so there will be problems for East Asia, Australia and East Africa, but not as severe as last winter.
- The current negative phase of the Pacific Decadal Oscillation and the weather patterns created by large eruptions of polar volcanoes will make even a moderate La Niña have the extreme weather impact of a strong La Niña.
- A negative PDO produces a higher risk of winter and spring drought in north, affecting winter wheat, and central China, which interferes with corn and soybean planting.

SUMMARY

The La Niña has returned. It is bringing more extreme weather, including continuing drought in the southern US and a risk that nations from China to Canada, France to Russia will have a cold winter.

It's official. In the second week of September the temperatures in the tropical Pacific cooled enough that the US Climate Projection Center announced a La Niña condition. They project that this huge patch of cooler water and its impact on the atmosphere will alter global weather patterns for the rest of autumn and the entire winter. This means colder conditions and extreme precipitation patterns for the world, including tropical and southern nations that will be trying to produce crops.

Of course no one condition controls global weather. A number of other factors will be interacting with the La Niña. The Atlantic and Indian oceans are warming and undergoing their own cycles. Volcanic ash and chemicals are swirling in the Arctic and Antarctic air mass. These factors will clash and combine.

In short, we are facing a complex and extreme winter.

Let's examine these factors and their impacts.

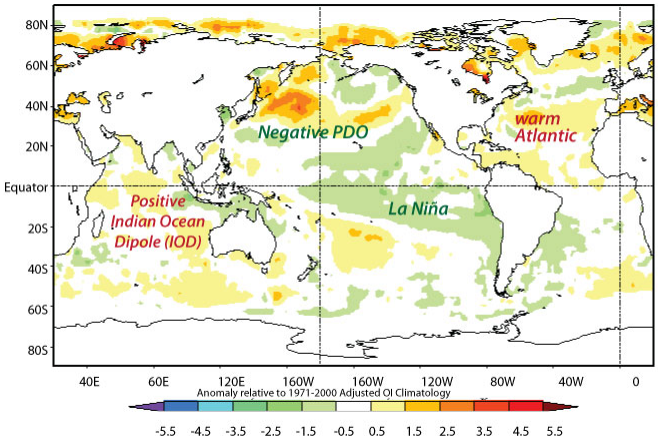


FIG. 1 **The oceans are shaping an extreme winter**

http://www.emc.ncep.noaa.gov/research/cmb/sst_analysis/images/wkanomv2.png

CONTENTS

This newsletter contains articles, observations and facts to support our contention that man is significantly influenced by the climate in which he exists. Our calculations show the climate, over the next term, will cause dramatic changes in our social and economic patterns.

We feel that the reader, attuned to the changes that are occurring, may develop a competitive edge; and, by understanding his now and future environment, can use the momentum of change to his advantage.

Methodology

First – over the past few months, the ***Browning Newsletter*** has gotten a number of new readers. So let me explain how we work.

1. As historical climatologists, we examine the factors that are shaping the upcoming seasonal climate.
2. Then we then go through our records to examine which years had similar conditions. We have hundreds of years of records. We find at least 5 similar years.
3. Next we explain to our readers what the weather conditions were like during the years with similar conditions. Usually the conditions we describe occurred 70 – 80% of similar years. This gives you, the decision maker, an educated perspective when making decisions.
4. We then give the latest scientific findings on the evolving natural conditions. We try to combine science, the information on why events are happening, with wisdom, which is pattern recognition.

While we have been, sometimes, wrong we have never been casual in our approach.

La Niña

Last year's La Niña began in July, continued through summer, fall, winter and spring, finally ending in June. Though the event technically ended, since the waters in the tropical Pacific were within 0.5˚C (0.9˚F) of normal, many of its effects lingered. This is typical, since the normal pattern is for the global weather effects of La Niña to fade first in the tropics and to linger in the higher latitudes for a few more weeks. (This is why the southern states, particularly Texas, continued to have drought conditions.) However, even in the tropics, the wind conditions never entirely returned to normal. Many scientists watched these wind patterns and predicted that La Niña would return.

There was not international agreement. Most computer models predicted that the tropical Pacific would remain neutral, with water temperatures remaining near average. Indeed, one or two models thought the Pacific waters would continue to warm up and become a hot El Niño. However some agencies, particularly the US Climate Prediction Center and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) correctly warned that La Niña would return, although most thought it would come back sometime in late fall. Instead the phenomenon returned in mid-September before autumn even began. **It returned before some areas, including drought-stricken Texas, have recovered from the last event.**

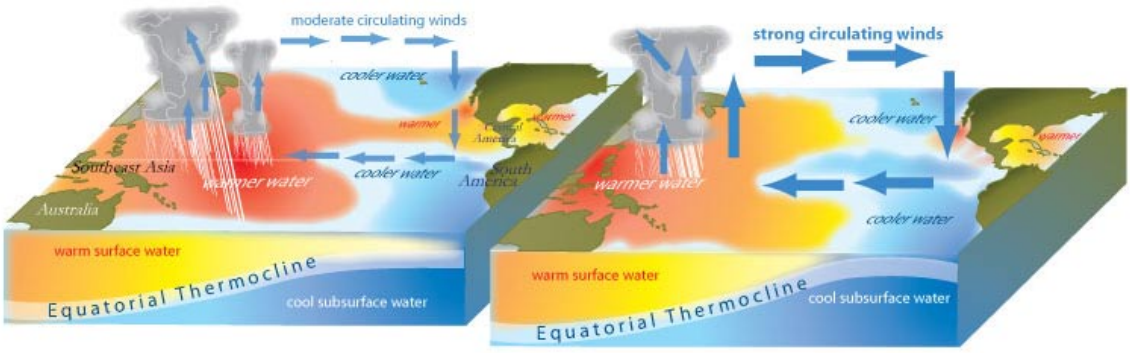
So what does having another La Niña mean for global weather?

- La Niña is part of a larger water/atmospheric process called the El Niño/Southern Oscillation (ENSO). This is a combination of changing water temperatures and wind patterns, including stronger east-to-west Trade Winds.
- Although La Niña is called a cold water phenomenon, this does not mean the entire tropical Pacific is cold. Typically the central and eastern waters are cooler and the western waters around Asia and Northern Australia are warmer. This is because the stronger Trade Winds blow the sun-warmed surface waters westward, concentrating the warmth around Indonesia. The result has been warmer Asian waters powering powerful typhoons that hit both the Philippines and Japan. This also changes monsoon conditions, which are determined by the contrast in temperatures between land and water.
- Having a La Niña with over a million square miles of unusually cool waters changes not only surface winds, but also winds at the highest levels. These winds alter weather conditions and storm growth throughout the Pacific and the globe.

The return of La Niña has been very bad news for Texas and the Southern Plains.

Fortunately, we have a long series of records of El Niño and La Niña events. Because the phenomenon affected the rainfall in South America, the Incas and other civilizations in the Andes Mountains kept meticulous records of when they happened. The Spanish Empire began recording them in the 1540s so we have an almost 450 year data base.

What these records show is that La Niñas typically cause flooding in Indonesia, Northern Australia, Venezuela, Northeastern Brazil and South Africa. The Southern US, Argentina, the Central Pacific (Fiji) and portions of East Africa have drought. Typically Western Canada, the Pacific Northwest and Japan have cold winters. There is less statistical data work depicting what happens when the event is strong, but history seems to show that North America is colder and both South America and

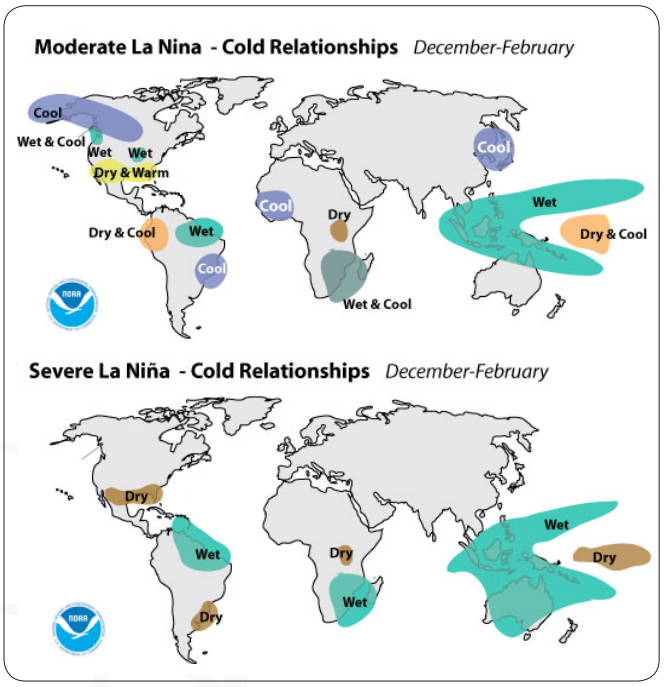


FIGS. 2-3 **Normal** *(left)* **and La Niña conditions in the Pacific** *December-February*

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensocycle/meanrain.shtml & http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensocycle/lanina_schem.shtml

Australia have more flooding. History also shows that the La Niña tends to strengthen winter monsoon seasons (the cold dry season) in the Northwestern Pacific, affecting North and Central China, North Korea and Japan.

Meanwhile, the return of La Niña has been very bad news for Texas and the Southern Plains. Typically this is the time of year when Texas would be receiving heavy tropical moisture, even hurricanes. By having a La Niña arrive within three months of another La Niña ending, however, the dry impact of the phenomenon has been renewed and will continue through the rest of fall and winter. This is terrible news and will, for example, have a huge impact on beef production



FIGS. 4-5 **Temperature and precipitation anomalies caused by moderate (top) and severe La Niña**
courtesy: NOAA

Other Factors: Polar Volcanoes, the Warm Atlantic, and the IOD

VOLCANOES: As mentioned in several earlier issues of the Browning Newsletter, there have been three large volcano eruptions this year – the May eruption of Iceland's Grímsvötn volcano, a series of smaller eruptions of Russia's Mt. Sheveluch and the massive explosion of Chile's Puyehue-Cordón Caulle. The debris from these eruptions is joining the remnants of chemicals and ash from the 2009 eruptions of Alaska's Mt. Redoubt and Russia's Sarychev Peak.

If the eruptions are large enough to enter the stratosphere, as these three have been, their debris lingers in the air for years, changing climate. It has four effects. First, the ash and aerosols (solid and liquid particles) reflect back incoming sunlight before it can warm the Earth's surface. Secondly, water clusters around the aerosols, forming thick clouds that also reflect sunlight. Thirdly, the cooler air changes air pressure which, in turn, alters wind patterns. In the case of polar volcanoes, it tends to weaken circumpolar winds, allowing Arctic and Antarctic air to escape. Finally, the wet dusty air collects enough moisture that it precipitates out in flooding rains or massive blizzards.

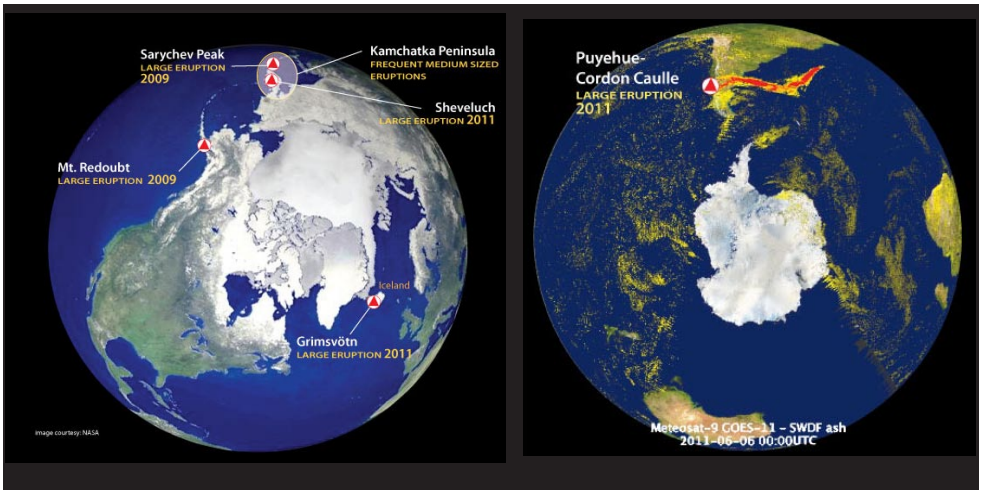
In summer, the prevailing winds trapped most of the debris in the polar latitudes. Only Europe, downwind from the eruption in Iceland, experienced volcanic cold. Indeed, in England, this has been the coldest summer in 18 years. Nations from Northern Spain to Germany experience July temperatures 1° – 3°C (1.8° – 5.4°F) cooler than normal.

Expect this to change as autumn continues. As seasonal cooling expands the polar air mass, we should see a cooler wetter fall, particularly in the Midwest and Northeast, Western Europe, and Eastern Siberia and (potentially) Northern China. This should continue, shaping a very cold winter in the Northern Hemisphere.

Ironically as the circumpolar winds weaken, allowing Arctic air to blast southward, the actual Arctic Circle becomes slightly warmer. The cold air is no longer concentrated in polar regions. Expect northern areas in Canada, Siberia and even Scandinavia to experience warmer weather.

Additionally, history and a few scientific studies seem to indicate that large polar volcanoes reinforce some of the climate effects of La Niñas. Both produce cold winters in North America. The good news is that there seems to be some evidence that this may reduce the likelihood of La Niña producing a drought in California. In particular, it increases moisture which will probably end the Western fire season early.

A WARM ATLANTIC: Part of what made this past year so extreme and will continue to create violent weather events is the contrasting natural factors shaping the climate. Both the La Niña and the volcanic debris are creating cold conditions. Two of the other great oceans, (the Atlantic and Indian), however, are creating warm conditions and the clash of these contrasting air masses has been creating powerful storms.



FIGS. 6-7 **Since 2009, five large polar volcanoes have been shaping global climate.**
left: Image courtesy NASA right: http://pubs.usgs.gov/gip/dynamic/slabs.html

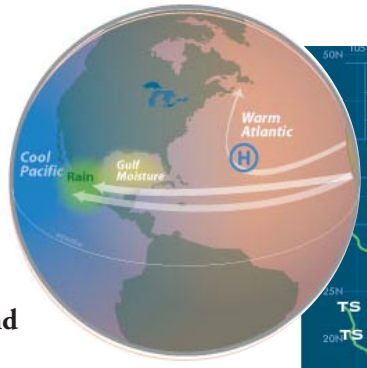


FIG. 8 **The combination of a warm Atlantic and cooler eastern Pacific can encourage more storms and moisture to hit Mexico and leave the US Plains drier.** *© Browning Newsletter*

FIG. 9 **The pattern of the 2011 Atlantic Hurricane Season has been shaped by the warm Atlantic and cooler Pacific.** *© Browning Newsletter*

The Atlantic is in the 16th year of a long cycle (the Atlantic Decadal Oscillation or AMO) of warmer conditions. The Gulf Stream and other currents are flowing more rapidly, carrying hot tropical water into the North Atlantic. This year the flow of the currents have been particularly strong and ocean temperatures averaged from 0.5˚ – 2.5˚C (0.9˚ – 4.5˚F) hotter than normal. This has created enormous amounts of heat and moisture to fuel storms.

We have seen this phenomenon this hurricane season. Normally the Atlantic hurricane season has 9 or 10 tropical storms of which 5 or 6 are hurricanes and 2 or 3 are powerful Category 3 or higher. This year, with two more months to run, has already had 16 tropical storms. So far four, Irene, Katia, Maria and Ophelia, have become hurricanes, with Irene, Katia, and Ophelia becoming major storms.

The remnants of last spring's La Niña and the renewal of La Niña this month have been a blessing to the US gas and oil production in the Gulf of Mexico. When the western coastlines are cooler and the Atlantic is hot, tropical storms historically tend to be blown straight into Mexico or up along the East Coast. In 2010, when La Niña started in July and lingered through the hurricane season, wind conditions, including very strong trade winds, tended to steer storms away from US shores. This year the phenomenon ended in the early months of the season although some of its effects lingered. Now that it has renewed, there is a statistically lower probability of intense hurricanes entering US (not Mexican) oil fields.

The warm phase of the Atlantic not only heated the ocean waters, it also heated the surrounding land masses, or at least those not directly downwind from the Icelandic volcano. We saw the results broiling the US east of the Rockies throughout this summer. Similarly Brazil and Africa north of the equator showed similar warmth.

Ironically, the warm Atlantic not only shapes hotter summers for the nations along its rim – it creates colder winters. In winter, the cold polar air mass expands south. It is difficult for it to expand south over the heated air over the hotter Atlantic. Instead, more frequently, it plunges further south in the cooler land masses. Cold continental air plunges deep into Central and Eastern Canada, the Great Plains, Midwest and East Coast. On the other side of the Atlantic, cold dry Arctic air chills Europe. Ironically, even when temperatures are cold enough to encourage glacier growth, the reduced moisture results in less snowfall. As the jet stream winds adjust, to allow the deep plunge of the Arctic air, they fluctuate wildly. This wild fluctuation continues around the entire Arctic circle, so that downwind, in Asia, societies experience unusual temperatures. Some studies found that this disruption continues as far east as Japan.

This pattern of plunging Arctic air is called a negative North Atlantic Oscillation **(NAO)**. It is a huge weather patterns that lasts for days or weeks at a time. It alternates with the positive NAO weather pattern that where the jet stream winds have a more lateral flow and both Europe and the eastern US experience warmer winters. However, when the Atlantic is warm, cold negative NAOs are much more common and sometimes last for a month or more at a time.

Notice the NAO usually produces warmer weather in Southern Europe.

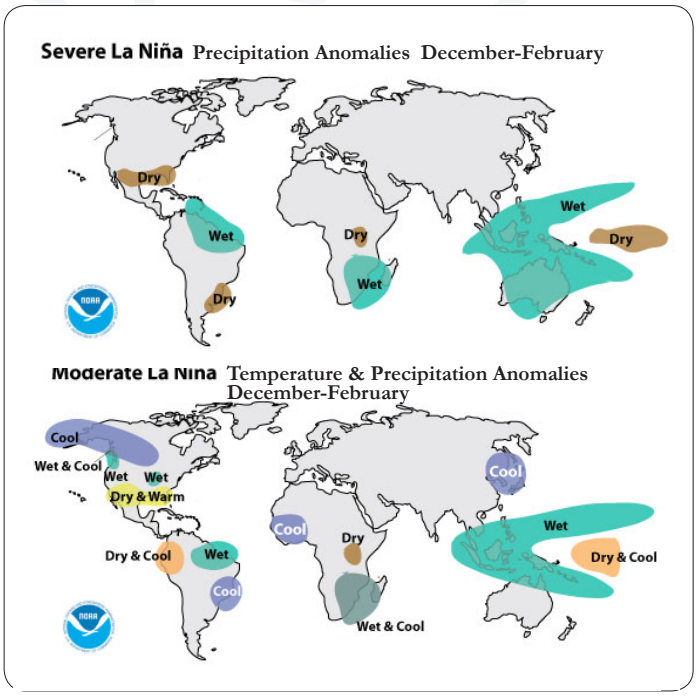
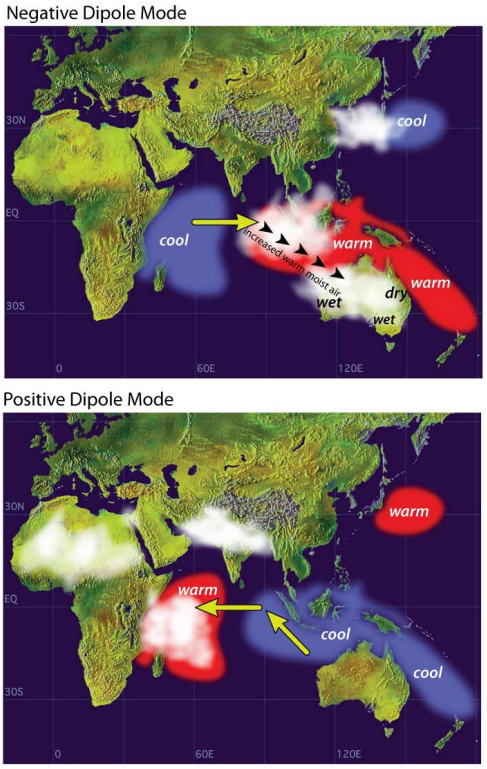


FIG. 10 *courtesy NOAA*



FIGS 11-12 **The Indian Ocean Dipole**
Last winter *(top)* **and this winter** *(bottom)*
w.jamstec.go.jp/frsgc/research/d1/iod/

Remember last year. Expect mid-winter to be frigid but southern Europe to warm late winter and potentially produce a very hot spring.

Like the polar volcanic debris, this weather pattern will have the perverse effect of making the Arctic slightly warmer even as the polar air chills more southern regions. The southern blast of the winds will shift the sea ice away from the North Pole, forcing some out into the North Atlantic. Expect to hear experts discuss the warming Arctic and vanishing ice, even as you shiver in the cold.

THE INDIAN OCEAN: Like the Atlantic, the Indian Ocean is warm. It has been warming for the last 50 years. Like the Pacific, it has an El Niño/La Niña type of pattern where warm waters move to the east or west side of the ocean and create massive climate alterations.

The cycle in the Indian Ocean is called the Indian Ocean Dipole **(IOD)**. The location of the ocean's warmer or cooler water shapes the monsoons of Asia, Australia East Africa.

Last winter the IOD was negative, which historically creates drier weather in Africa and India, and stronger monsoons in Northeastern and Australia. China experiences a stronger monsoon in the northern and central portions of the nation and a weaker monsoon around the South China Sea. This, joined with La Niña to create the terrible flooding in Australia and deadly drought in East Asia.

This year, the Japan Agency for Marine-Earth Science and Technology predicted a weakly positive IOD. This is one of the reasons that India's monsoon was so good, producing record soybeans. This is excellent news. The effects of the positive IOD will partially mitigate the impact of La Niña on East and Southeast Asia and may prevent massive flooding in Australia. East Africa has a better chance of s milder drought this winter when compared to the disaster of last year.

North America

Let's see how the combination of these global conditions will affect North America. Basically the continent will be hit by a "triple whammy", three factors that will shape a volatile autumn followed by a cold and stormy winter.

Basically the cold from the volcanically cooled polar air mass and the La Niña West Coast flows east and hits the warm wet Atlantic air like a car crash. This means cold and dry in the West and North and wet stormy conditions from the Prairie Provinces to the Central Plains, through the Midwest to East Canada and East Coast.

The presence of the cold La Niña water off the Pacific Coat opposite the warm Atlantic almost immediately altered the Atlantic hurricane season. The later season hurricanes have backed away from the East Coast and are now wandering up the Atlantic Ocean, just as they did during last year's La Niña. At the same time, the heat and drying of a La Niña are once again driving Atlantic moisture away from Texas and the Southern Plains.

It has also altered the outlook for autumn. La Niña produces warm weather and the early arrival of the event will produce a warmer, more volatile fall. The La Niña will produce southern warmth, the volcanoes will produce northern cool and the two air masses will battle across North America. Typically, warmth will be more frequent in the West and Central US in the middle of the season, but we will still see sharp cold fronts in the Midwest and East. Then, the cold fronts will hit the Atlantic air mass and rain out.

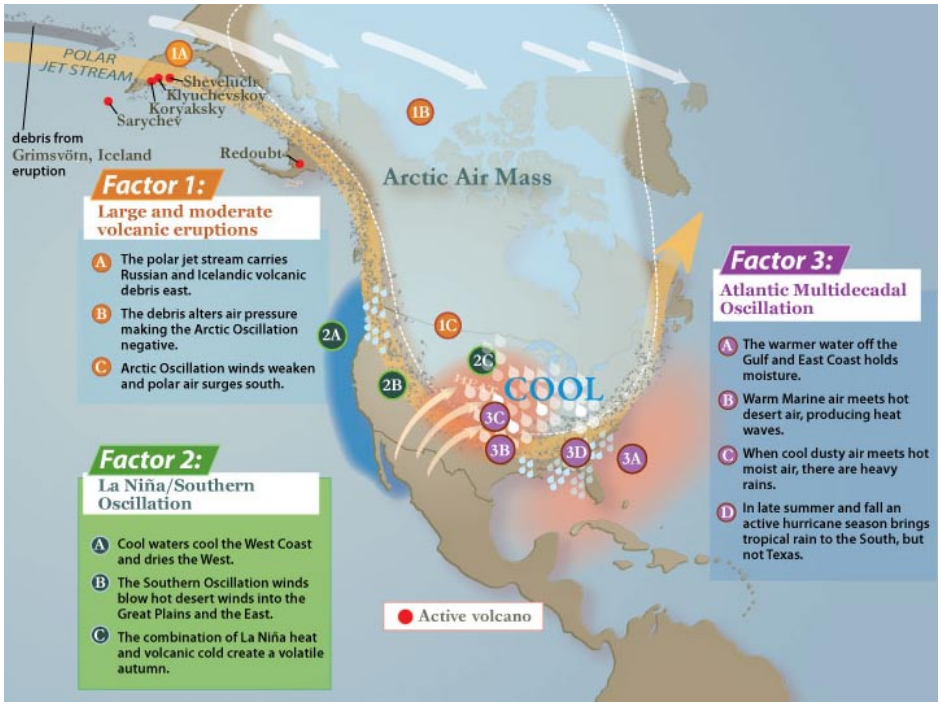


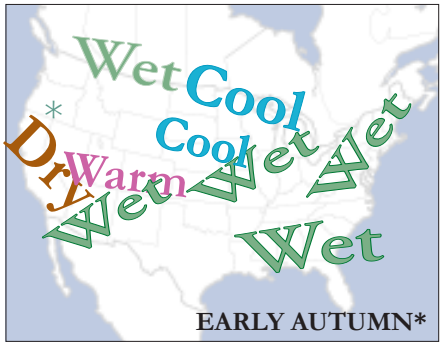
FIG. 13 **"Triple Whammy" of factors driving autumn's weather** © Browning Newsletter

When winter arrives, expect it to be as miserable as last year. Unlike Asia, where the cold will be slightly moderated by the positive IOD, this winter looks to be a replay of 2010-2011.

In short, think about what you should have done last winter. This winter's replay will give you another chance to do it right.

Cool	Hot	Warm	Dry	Wet
2°C or more lower than normal temps.	5°C or more higher than normal temps.	2-4°C or more higher than normal temps.	75% or less of normal moisture	125% or more of normal moisture

FIGS. 14-16 * Moderate eruptions in the Pacific Northwest will bring more moisture to the west. © Browning maps

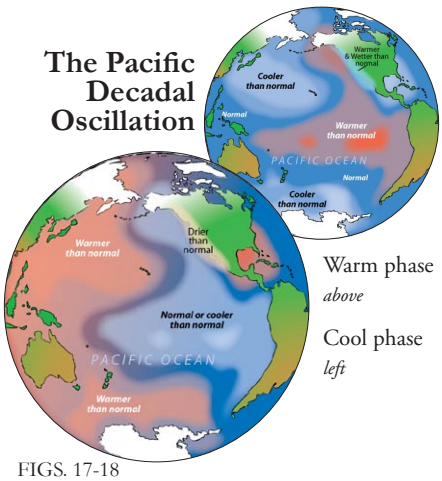


THE PDO – THE BIG CHANGE IN THE PACIFIC, Part 1

SUMMARY

The combination of this year's negative phase of the Pacific Decadal Oscillation with the new La Niña will create some predictable global weather problems over the next six months.

Back in April, during the last La Niña, the *Browning Newsletter* discussed a major climate factor, the Pacific Decadal Oscillation **(PDO)**. It is a very large, slow fluctuation of temperatures in the North Pacific, from warm to cold and back to warm again. The cycle is roughly fifty to sixty years long, with each phase lasting twenty to thirty years. It has recently tipped, becoming negative. This will have a major impact on the severity of this year's fall and winter.



FIGS. 17-18
The Pacific has trended toward a cool phase since 2006
© Browning maps

Unlike the El Niño/La Niña, which has been examined for over 400 years and scientifically studied for the past 150 years, we are still in the early stages of understanding the PDO. Most of our observation is from the past century of ocean measurements and studies of fish populations, Pacific Northwest tree rings (Gedalof et al. 2002) and geoduck shells (Strom 2003). (A geoduck is a pornographic-looking clam that grows a new ring on its shell every year. They are among the longest-living animals on earth with the oldest known individual being 168 years old.) We still don't know the cause of the temperature shift but scientific understanding of the cycle has been growing rapidly over the past decade.

The oscillation can affect the entire Pacific but its impact is concentrated in the northern waters. Not surprisingly, it interacts with the much shorter El Niño/La Niña cycle in the tropics. When it is in its warm positive phase, it enhances warm El Niños and minimizes the impact of cool La Niñas. If it is in the cooler negative phase, it creates stronger La Niñas, creating much more extreme weather. The impacts of warm El Niños become milder.

Just as El Niños and La Niñas are interrupted by the brief Madden Julian Oscillation, so these long PDO phases are interrupted by the 6 to 30 month long El Niños and La Niñas. The Pacific is swirling with a lot of cycles. The PDO warm and cool phases are trends with frequent interruptions. As a climatologist, I check the PDO index every few weeks. According to a number of scientists, the last warm phase lasted from 1976 to 1998. It began to change and by 2006 had tipped to the cool phase. This cool phase was interrupted by the 2009-2010 warm El Niño for 9 months.

Since June 2010, the PDO has consistently been negative and it is currently strongly negative. This autumn and winter, the Earth is experiencing a cool La Niña in the tropical Pacific.

Even if this year's La Niña is only moderate, as determined by ocean temperatures, its weather impact will be very strong, particularly in North and Central America. The weather impact of La Niña in the Northern Hemisphere will be increased by a combination of volcanic debris in the polar air mass and the current negative PDO.

What does this mean for weather? History shows:

- In the long-term, a negative PDO makes the waters off the West Coast of the Americas cooler. This cools the atmosphere and colder air holds less humidity. Less moisture is blown inland and the western mountain ranges in both North and South America have less snow. This produces several

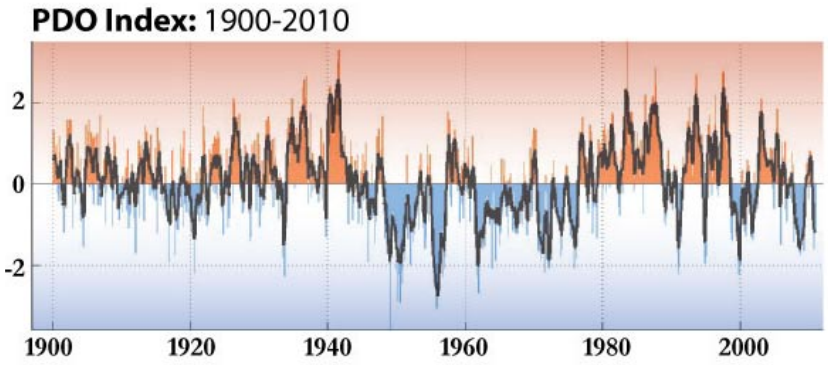


FIG. 19 *http://jisao.washington.edu/pdo/img/pdo_latest.jpeg*

decades of increased risk of drought for both continents, affecting grain production in Canada, the USA and Argentina. The ash from Russian volcanoes broke this cycle for the Cascades, Sierras and northern and central Rockies (Ski Utah & Colorado!) since 2009, but the outlook for the next 2 decades is not good.

- Expect a very cold mid-winter in North America. Typically the cooler weather starts in the Pacific Northwest and Western Canada, and the cooler wetter conditions linger all winter. In the Midwest and East, La Niñas create stormy autumns, milder early and late winters and very harsh mid-winters. Normally the South has warmer, drier conditions, but as last year showed, periodic fronts can bring incredibly cold temperatures down to the southern growing areas in Florida, Texas and the Southwest. This can damage citrus and vegetable crops and increase winter stress on livestock.
- The drought in the Southern US will be severe. Typically autumn brings some rain to the US, with cold front rains in Texas and the Southwest and tropical moisture in the Central and Eastern Gulf. This is followed by an intensely dry winter and, usually, a dry springtime in the South.
- In autumn, cool waters off the Pacific help create stronger trade winds in the Atlantic, causing more tropical storm landings in Mexico. Already Mexico has been hit by Tropical Storms Arlene, Don, Harvey, and Nate. This should switch to much drier and cooler weather in Mexico this winter.
- The PDO moves warmer water along the Asian coast. This helps create stronger typhoons. As this is being written, Hong Kong has locked down, suspending financial markets, schools and transport services as the deadly typhoon Nesat bring disruptions to the city. Further east, the Philippines are being threatened by a new typhoon, Quiel (international name Nalgae) only a day after Nesat killed 35 people and caused major flooding.
- The combination of a PDO and La Niña will make a stronger Northwest Pacific monsoon the affects North and Central China, Korea and Japan. This means a stronger drier season and with the current La Niña there is a risk of severe drought, like the problems we saw on the Yangtze River. Also, with colder Siberian air crashing against warmer Pacific Marine air, coastal regions of Central China faces severe snow which can block transportation.
- If the La Niña lingers into spring, the Yangtze and central China can switch from drought to floods. Even when the La Niña fades, the PDO will bring a more plentiful wet monsoon which historically has been good for Chinese agriculture.
- The negative PDO causes a weaker South China Sea monsoon. This means monsoon moisture does not penetrate as far inland during the rainy season. A negative PDO causes more summertime droughts in Southwest China. Basically a negative PDO produces a higher risk of winter and spring drought in the north, affecting winter wheat, and in central China, which interferes with corn and soybean planting. Southwestern China and its rice crops face greater risks of summertime drought.
- Typically India has stronger and more reliable monsoons during the negative PDO phase. It should be noted that the weak monsoon of 2009 was (among other things) when the PDO briefly turned positive.
- Although the PDO is focused in the North Pacific, tree ring studies show a correlation, especially during La Niñas, of the negative phase some weather patterns in the Southern Hemisphere. One of the strongest correlations is with droughts in Argentina and more abundant rainfall in southern Brazil.
- Similarly tree ring studies show a correlation of negative PDO phases and abundant rain, even flooding, in Australia and Indonesia.

In short, the change in the PDO has a number of important, very predictable effects on global weather. Since 2006 we have seen more negative PDO conditions, which helped to create extreme La Niña weather. This affected agriculture, energy, national infrastructures, travel, insurance and a number of other aspects of the economy. As the same time, as changing precipitation created crop difficulties, it affected social stability. In the next two issues of the Browning Newsletter, we will examine these concerns in more detail.

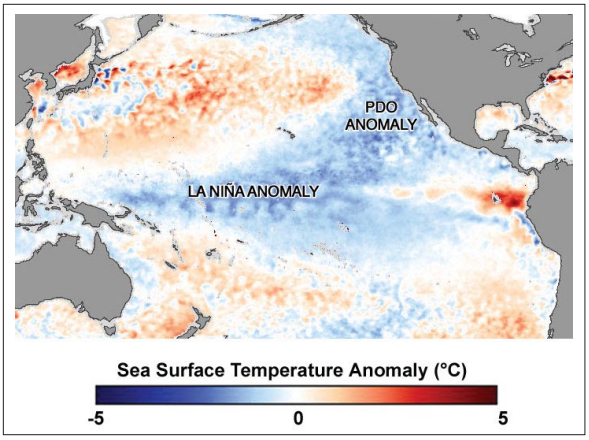


FIG. 20 **A La Niña magnifies the impact of a cold PDO**
http://en.wikipedia.org/wiki/File:La_Nina_and_Pacific_Decadal_Anomalies_-_April_2008.png

News Notes

What if a huge volcano erupted and no one noticed? This happened twice this year.

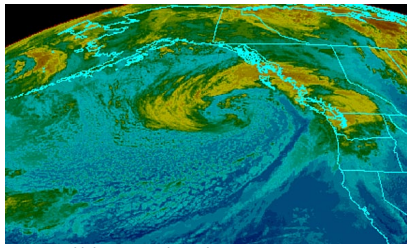
Remember when Eyjafjallajökul volcano erupted in Iceland, and everyone warned that it might trigger an even larger eruption in neighboring Mt. Katla. Well, an Icelandic geophysicist, Einar Kjartansson, says that the Katla volcano probably erupted this summer and no one noticed. It exploded without breaking the surface of the thick glacier that covers it. Instead it created a severe flood as the result of geothermal heat melting the ice. The water then broke through, causing a short, sharp flood. Seismic activity rumbled in the region and huge areas of the glacier sank down, particularly over the crater. Dr. Kjartansson warns that if a small Katla eruption did take place this summer, it does not necessarily mean that the pressure inside the volcano dropped significantly, or that another eruption is less likely than it otherwise would have been.

On the opposite side of the globe, Russia's Mt. Sheveluch erupted and also has been ignored. It has erupted almost every week, with ash and chemicals reaching 8.5 km. (5.3 miles) high in February and March and growing even stronger through April, May and June. By June, the volcano had a two week eruption that was 10 km (6.3 miles) high. While a tropical volcano must be at least 15 km (10 miles) high to enter the stratosphere and affect global climate, a polar volcano only needs to be 7.2 km (4.5 miles) high. The eruptions of Sheveluch have entered the stratosphere several times this year. The latest eruption to enter the stratosphere was a 8.6 km (5.4 miles) explosion in late August and early September.

This has been the year of transoceanic tropical storms.

Who doesn't want to visit the green hills of Ireland. Unfortunately the remnants of Katia slammed the British Isles thousands of homes without power, felling dozens of trees and disrupting travel in Ireland and parts of Scotland. Hurricane strength winds up to 136 kph (85.1 mph) hit parts of the coast. Basically the Atlantic is so hot that even when hurricanes dwindle to extra-tropical storms, they can be deadly.

The same thing is happening in the Pacific. The negative PDO has made the Northern Pacific so warm that the remnants of Typhoon Roke crossed the ocean. After ripping Japan, close to the nation's earthquake damaged coastline, the remnants of Roke crossed the ocean and lashed British Columbia 105 mph (169 kph) winds. It caused ocean swells off of Canada as high as 32 ft. (9.8 m.) high and heavy rains, with some floods and landslides. This is the first of a series of "Pineapple Express" storms the Pacific Northwest can expect this year. This infrared satellite image, courtesy of the Oklahoma Weather Lab, shows former Typhoon Roke over the northeastern Pacific Ocean, just offshore of British Columbia.



courtesy Oklahoma Weather Lab

It's not just cuddly-looking white polar bears! Preliminary data from the US. National Snow & Ice Data Center indicates that on September 9th Arctic sea ice extent reached its second lowest value on record, behind 2007. According to the USGS's Alaska Science Center this has been hurting the walrus population. Walruses typically spend summer far offshore, foraging for food and resting on ice floes. However, these ice floes are melting, forcing the walruses to forage closer to land and rest ashore. This poses a problem because, with so many animals crowded together, the young calves can be trampled to death. This is the fourth year (also 2007, 2009, and 2010) this phenomenon has been observed in recent times. Walruses are currently being considered for inclusion on the endangered species list.

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The opinions expressed are those of the writer, and although they are based on extensive studies of physical data and phenomena, many statements published here are not entitled to be regarded as rigorously proved in a scientific sense. Some decades must pass before these issues are resolved.

Meanwhile, decisions must be based on the best available information and estimates.

This newsletter will **not** contain:

- *Analysis of, or recommendations concerning, any investment possibilities.*
- *Recommendations on any particular course of action.*

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