

BROWNING

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NEWSLETTER

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.....
 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.

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 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.

HOW BIG? HOW STRONG?

SUMMARY: *The La Niña continues to grow stronger and, combined with other factors, will shape a cold and stormy winter.*

One of the pleasures of viewing the sport is watching the teamwork of the defensive unit. Some player on the offense is holding the ball and the entire defense rallies to crush him. Sometimes a sole player takes the runner down, but frequently it's a gang tackle. One by one, giant tacklers pile on the runner, leaving the flattened player buried in behemoths.

Ouch!

I think about weather, not sports – but I'm watching a potential pileup. Three enormous weather patterns are surrounding North America. All three cause cold winter weather. Expect to be flattened.

What season is it? I'm a climatologist, so at this time of year I automatically think about autumn and the onset of winter. However, if you have testosterone and are American, the odds are that a lot of you think of this time of year as FOOTBALL SEASON. (If you are Canadian and polishing a hockey stick, please bear with me.)

In this issue

1 How Big? How Strong?

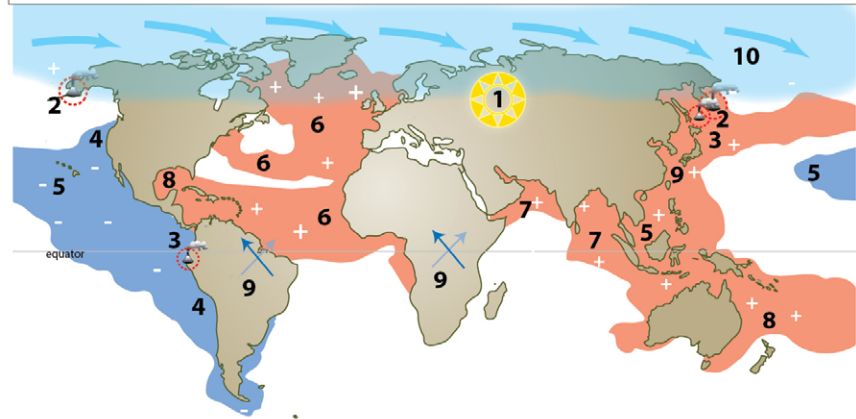
How powerful will this La Niña be?

4 La Niña – The Economic Impact

What is the social and economic impact of a large La Niña?

8 NEWS NOTES

Natural Factors Shaping Autumn & Winter's Weather



- 1 The sun is beginning a new solar cycle.
- 2 Large volcanic eruptions have put climate changing debris in the stratosphere.
- 3 Several volcanoes continue to have small and medium-sized eruptions.
- 4 The waters off the West Coast are cooling..
- 5 A moderate to strong La Niña.
- 6 Most of the Atlantic is unusually warm (a positive AMO).
- 7 Most of the Indian Ocean is warmer than average.
- 8 The waters off of East Asia and Australia are warming (a cool PDO/IPO).
- 9 The high altitude Quasi Biannual Oscillation (QBO) winds are changing.
- 10 The Arctic Oscillation are weaker and will let the Polar air mass surge south.

La Niña – Small, Medium or Large?

The Pacific Ocean covers almost 30% of the Earth's entire surface. Its patterns and weather events dominate the globe. When it experiences a cycle, the whole Earth goes along for the ride.

Currently the Pacific is experiencing a La Niña. Starting in March, the warm tropical waters in the central and eastern ocean began to cool. At the time the Pacific was in the middle of a warm, wet El Niño. By April, the El Niño had disappeared. By May the ocean's tropical waters were over 0.5°C (0.9°F) below normal – La Niña conditions. The rapid and tremendous change in temperature of thousands of square miles of the Pacific was an extreme event and it helped shape this summer's extreme weather.

If all of these [variables] are combined, then the current La Niña is the strongest in over 70 years.

Ocean temperatures in the Tropical Pacific continued to drop. Temperatures between 0.5° - 1.0°C (0.9° - 1.8°F) below normal are considered a “weak” La Niña. When the chill is more than 1.0°C (1.8°F) below normal, the event is “moderate”. Now temperatures range from 1.4°C (2.5°F) below normal in the Central Pacific around Fiji to 2.0°C (3.6°F) off the coast of Peru.

Measurements show that while temperatures in the central waters are stalling,

the Eastern Pacific is continuing to cool. Most climate models seem to indicate that this cooling will continue into mid-winter.

Temperatures, while easy to measure and dramatic to show on multi-colored satellite maps, are only part of the La Niña pattern – and not necessarily the most important part in shaping global weather. The La Niña is the cool ocean phase of a wind and water phenomenon called the El Niño/Southern Oscillation (ENSO). This is a large-scale weather event that involves changing ocean and air currents. It includes:

- Hundreds of square miles of cooling waters in the central and eastern Tropical Pacific.
- Cooling air above the ocean which changes the area's air pressure.
- Stronger tropical trade winds blowing from east to west.
- The trade winds blowing on the ocean surface so that there is less sun-warmed surface water in the eastern tropics and more of these waters in the western regions. Areas to the east grow cooler and the western Tropical Pacific grows warmer.
- Less rainfall in areas with a cooler atmosphere and more in the areas with warmer air that can hold more moisture.

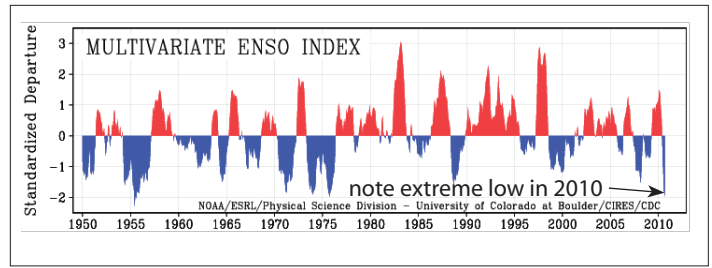
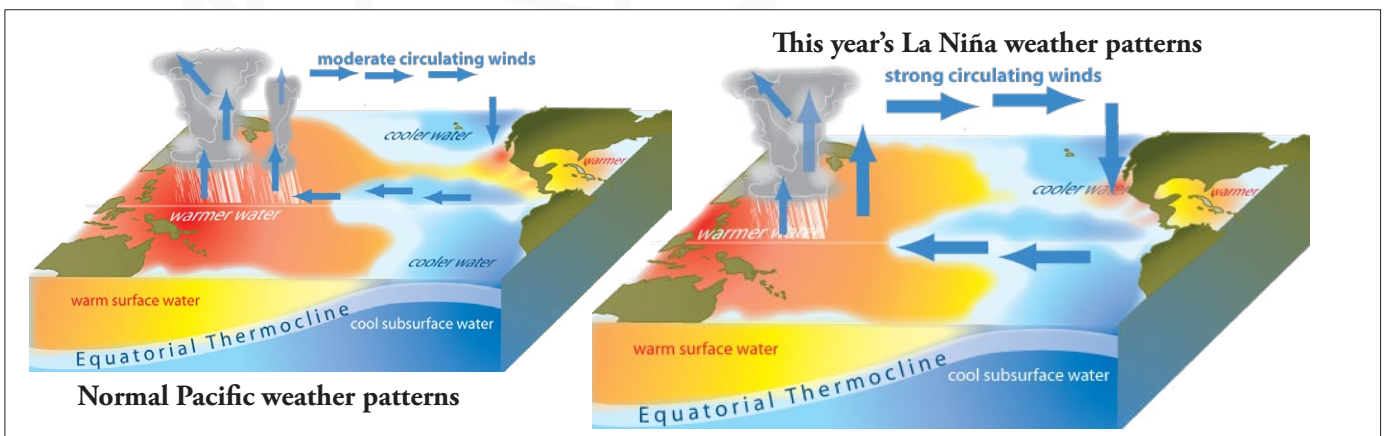


FIG. 2

Scientists measure all of this in an index called the Multivariate ENSO Index. This index combines sea-level pressure, wind measurements, sea surface temperatures, surface air temperatures and total cloudiness in the sky. If all of these are combined, then the current La Niña is the strongest in over 70 years. It is almost as intense as the La Niña in the winters of 1955 – 56. It is currently almost two standard deviations below normal and most models expect the phenomenon to intensify over the next 3 months. (It should be noted that this index is only one of many. It is typical of most measurements but some, like the Southern Oscillation Index kept by the Australian Bureau of Meteorology, indicate an even stronger event.)

What the Index shows is that the upcoming event is going to be even stronger than temperatures indicate. Even when the event was small to moderate this summer, we saw it shaping the coolest summer on record in Southern California. As the Atlantic hurricane season is showing, it has encouraged unusually strong tropical trade winds, so that a larger percentage of the tropical storms have been confined to the tropics, hitting Mexico and Central America, rather than US shores.

Part of this strong ENSO development



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

FIGS. 3-4

has been because this year's La Niña developed during the cool phase of the decades-long Pacific Decadal Oscillation (PDO). History shows that this phase of the ocean-wide event tends to weaken El Niños and strengthen the impact of La Niñas. It is not surprising that the last time we saw the Multivariate ENSO Index so low was during the 1950s and 1970s, which was the last time that the PDO was in its cool phase.

Last month, the *Browning Newsletter* wrote, "The current La Niña is moderate with signs of becoming quite strong." Climate models, satellite photos and measuring indices all show that the La Niña is now strong and growing stronger. **Expect North America to be tackled by a very strong La Niña this winter.**

The Arctic Oscillation and the North Atlantic Oscillation Pile On

A runner can frequently stay on his feet with only a single tackler. (Indeed, some powerhouses continue to run with a defensive player clinging to them and flapping in the wind.) Similarly, even though La Niñas traditionally bring cool weather, North America can remain warmer than normal during a La Niña. This year, however, two other climate factors, the debris from the Northern Pacific volcanoes and the Atlantic Multidecadal Oscillation will also bring cooler conditions. There will be a pile up and parts of North America are going to get buried.

THE VOLCANOES OF THE NORTH PACIFIC – From Russia to Alaska, the volcanoes of the North Pacific have been unusually active over the past two to three years. Since these eruptions have been in relatively isolated regions of the Earth, we haven't heard much about them in the news.

We have been feeling their impact however. Over the past few years, the debris from these eruptions has been lingering in the air and blocking incoming sunlight. This has cooled the air and altered air pressure in the Arctic. Science is suggesting that these altered air pressures are altering polar

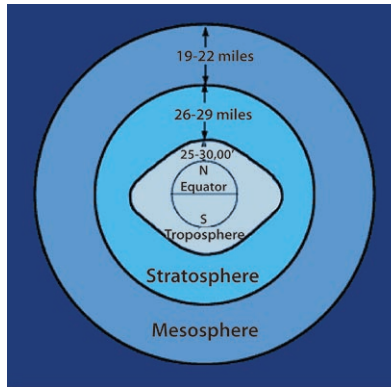


FIG. 5 Layers of Earth's Atmosphere

<http://virtualskies.arc.nasa.gov/weather/2.html>

wind patterns particularly the Arctic Oscillation.

What is particularly dangerous about these near Arctic eruptions is that they don't have to be as big to have a major impact on global climate. The rotation of the Earth distorts the troposphere, the dense layer of atmosphere that surrounds us, warms us and in which most of our weather occurs. It is disk shaped, 10.4 to 12.3 miles high around the equator and only 4.7 to 5.7 miles high over the poles. Volcanic debris tends to fall out rather rapidly in the thick troposphere, but if it can reach the thinner, quieter stratosphere, it can linger for years.

Last year, both Alaska's Mt. Redoubt and Russia's Sarychev Peak had eruptions that were over 10 miles high. This year, Russia's Kamchatka Peninsula has had up to 6 active volcanoes and two of them, Klyuchevskoy and Sheveluch, have had small-to-medium eruptions all year long. As recently as mid-October, Klyuchevskoy had an eruption 7.8 km (4.8 miles) high, strong enough to impact the stratosphere.

Once the volcanic ash reaches the stratosphere, it absorbs solar radiation and warms up. This heats the stratosphere. The thin stratospheric air expands. Meanwhile the lower level of air, the troposphere is not only cooling because it is receiving less radiation, it is also having abnormal pressure on it from above. This changes the

air pressure and winds of the lower level of air. Because the much of the change is coming from the stratosphere, it can linger for months.

This can have a major impact on the weather. How much of the cold polar air enters the US is determined by the Arctic Oscillation (AO). This oscillation is a measure of north-south differences in air pressure between the northern mid-latitudes and Polar Regions. These differences shape the winds which circle the polar air mass. When the AO is negative, the air pressure differences are relatively weak, with not much difference between the polar low and the mid-latitude high. This makes the winds very weak and the cold air escapes to the south. The Arctic is left warmer than normal and the lands to the south, in North America, Europe and Asia, freeze. We saw this happen last year, when North America, which normally is warm during an El Niño, experienced record-breaking blizzards.

This year may not have had the same giant eruptions as last year but there is still a lot of debris in the upper atmosphere. The Arctic Oscillation has been negative most of this autumn and is negative now. At the time of this writing, unusually cool and stormy weather is plunging south into western North America, Western Europe and Northern China. Expect a negative AO to be frequent this winter and to reinforce the cooling tendencies of La Niña.

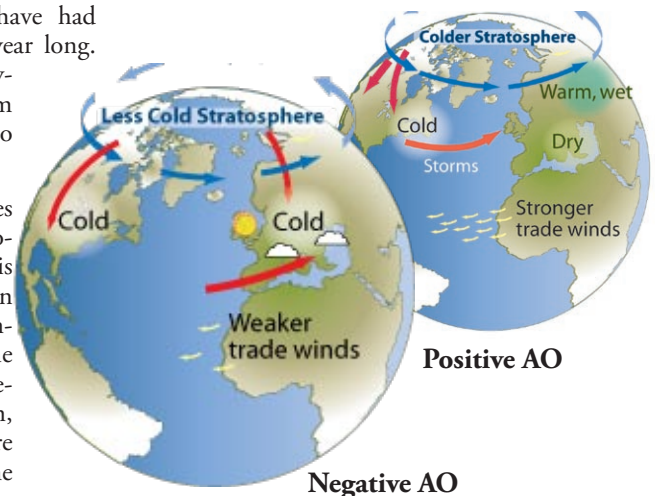


FIG. 6-7 Negative Arctic Oscillations will be more common this year

courtesy J.Wallace, University of Washington, source: NSIDC



FIG. 8 Three major influences on this winter's weather

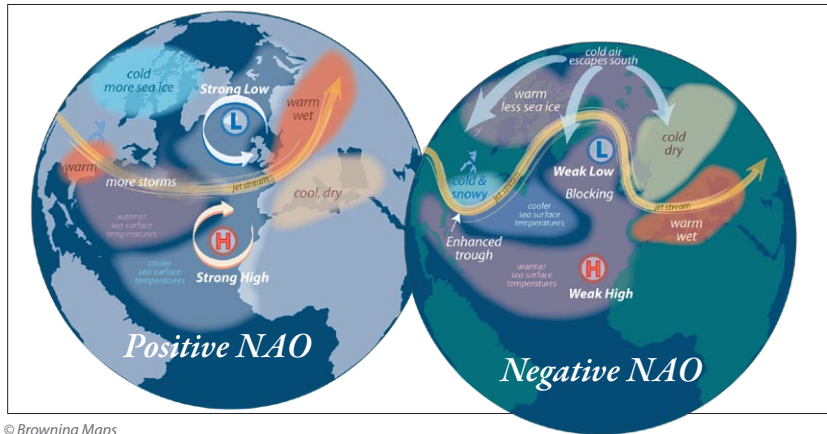
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THE WARM ATLANTIC MULTIDECADAL OSCILLATION – Volcanic dust and the Arctic Oscillation will not be the only factor reinforcing the cooling impact of this winter's La Niña. The long-term warmth in the Atlantic will also create weather conditions that will bring cold weather.

The Atlantic is in the warm phase of the decades-long Atlantic Multidecadal Oscillation (AMO). We have already seen the warm waters fuel a stormy Atlantic Hurricane Season, with (at the time of this writing) 17 tropical storms and 10 hurricanes. Expect these warm Atlantic waters to continue to create stormy conditions. The air pressure changes caused by the unusual warmth create a weather pattern called a negative North Atlantic Oscillation (NAO).

The North Atlantic Oscillation is the wind and storm patterns determined by the difference of atmospheric pressure between the Icelandic low and the Azores high. This difference controls the strength and direction of westerly winds and storm tracks across the North Atlantic. When the difference between these pressures is high, the west-to-east winds are very strong in the north and Arctic air masses remain trapped in the polar latitudes. When the NAO is negative, which is more frequent when the Atlantic is warm, it drives cool northern air masses deep into the Mid-western and Northeastern US and Europe. This pattern may last only a few days at a time, but when the Atlantic is this warm it occurs again and again throughout the winter.

Currently the Atlantic is 0.5° - 2.5°C (0.9° - 4.5°F) warmer than normal, with the greatest anomalies around the Icelandic low. Due to flow of the Atlantic's tropical currents, we can expect the warmth to continue and the NAO to encourage Arctic air to drop into Eastern Canada and the US. At the same time, the warm marine winds off of the Gulf and Atlantic should heat the Gulf and Eastern states. Normally this would set up a relatively warm winter that would have sharp, wet, stormy cold spells. Regions where the cold polar air hits the warm marine air would be explosively stormy. However, this winter, the alternating warm and cold in the East is going to be complicated by the cooling impact of the volcanic dust/AO effect and the huge La Niña.



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FIGS. 9-10

The Negative NAO has been more common since 1995

Flattened by Winter

When the La Niña, NAO and AO all combine this winter, it is going to create a complex and stormy winter, particularly for the Great Plains, Midwest and Northeast. The last time we saw anything similar was the winter of 2007 – 2008. Chicago and the Midwest endured 23 storms, 18 of them winter snow storms and 5 of them warm weather thunderstorms. (In a normal winter the region experiences 7 - 8 winter storms.) Indeed, three of the winter storms had “thunder snows.” They even had mid-winter tornadoes. Warm air surged up from the Gulf and cold air plunged south from the Arctic and the Midwest was a war zone. In the monthly records, the temperatures were near normal for the overall winter, but it was anything but a normal winter.

In other words, this winter is shaping up to be messy. The AO, the NAO and the La Niña will reinforce each other creating cool weather for the northern tier of states while the NAO and La Niña reinforce each other for bringing warm dry weather for the southern tier. Where the warm and cold air masses collide will be stormy.

In the 5 years with the most similar alignment of weather factors, we saw the following weather:

LATE AUTUMN -- The heat will continue to dominate North America as autumn ends. Temperatures will continue to be warmer than normal in the southern tier of states and the center of the continent. The Northwest and western Canada should experience an early onset of winter with cool, stormy weather. Meanwhile, in 60% of similar years, the Northeast has a cool late fall.

EARLY WINTER – Early winter is when the weather really starts to get chaotic. Cool western weather meets warm Southeastern weather and the Central Plains, Midwest and Northeast endure storm after storm. Meanwhile in 80% of similar years, Western Canada and the Pacific Northwest have heavy snows and coastal rains. In 60% of similar years, the storm track surges further south than average, leaving most of the US/ Canadian border and Great Lakes warmer than normal.

MID-WINTER – Mid winter can be described in three words – cold and stormy. Normally the South is dry, but the larger this winter’s La Niña is, the more likely it will be that there will be rain in the central and western Gulf states. Unfortunately in all 5 similar years, Georgia and parts of the Southeast suffered severe drought.

That’s how the season looks – action packed and violent. The wise reader will prepare just like any football player would – wrap up in warm padding and brace yourself.



Late Autumn



Early Winter



Mid Winter

Cool 2°C or more lower than normal temp.	Warm 2-4°C or more higher than normal temps.	Wet 125% or more of normal moisture	Dry 75% or less of normal moisture
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FIGS.11-13

© Browning Maps

LA NIÑA: THE ECONOMIC IMPACT

SUMMARY: *This winter's La Niña will have far reaching economic consequences. Prepare for storms and flooding, higher food and fuel prices, strains on the local infrastructure and, oh yeah, really great skiing.*

It has been on the front of this *Newsletter* since Dr. Browning began publication 34 years ago.

“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.”

Some weather events have major economic consequences and if you know they are coming, you can prepare. One of the most studied and understood weather events are El Niños and La Niñas. Historians have written reports of the phenomenon at least as far back as the early 1500s, when the Spanish conquistadores entered South America amid raging storms. There are even records of El Niños sweeping through pre-Columbian communities 400 years before that.

Given almost 500 years of weather records, it is possible to correlate El Niños and La Niñas with certain economic impacts. Twelve years ago, in September 1998, the *Browning Newsletter* noted “La Niñas strain the US economy. While the strain is only one factor of the economy, during downturns it can delay recoveries. When the economy is strong, investors mainly experience a disappointing first quarter . . .”

Periodically we remind our readers of how an El Niños or his evil sister, La Niña affects the economy. Of course, the impact varies, depending on the strength of the event. This event will be strong, perhaps

the strongest event in almost 25 years – so expect an impact.

Typically we see the impact in several areas:

1. **REAL ESTATE** – Extreme weather events can cause extensive property damage. La Niñas typically alter normal precipitation patterns causing floods, avalanches and droughts. Certain regions face increased risk of damage, bad news in an economy where property values are already declining. The areas of greatest risk are:

• **THE PACIFIC NORTHWEST**

Typically the Pacific Northwest experiences heavy snows and coastal flooding. During the last La Niña event in 2007, for example, a series of powerful Pacific storms that affected the U.S. states of Oregon and Washington and the Canadian province of British Columbia between December 1, 2007 and December 3, 2007. Called the Great Coastal Gale of 2007, the storms on had hurricane-force wind gusts of up to 137 mph (220 km/h) at Holy Cross, Washington and 129 mph (208 km/h) at Bay City, Oregon on the Oregon Coast. The storm also brought heavy rains and produced widespread record flooding throughout the region, and was blamed for at least 18 deaths.

• **SOUTHERN CALIFORNIA AND THE SOUTHWEST** – Studies by Jan Null and John Monteverdi, professors at San Francisco State University, show that Southern California averages at least 25% less rainfall than normal during La Niñas. Additionally there is a greater probability of Santa Ana winds with their accompanying wild fires.

• **THE SOUTH** – Statistically, Mississippi, Arkansas, western Tennessee, western Kentucky are hit by more tornadoes during La Niña years. During the 2007 - 2008 La Niña, the US experienced the second most active tornado season on record.

• **THE MIDWEST** – There is a strong historical correlation between La

Niñas and flooding in the Mississippi and Ohio Rivers. Typically the Midwest has heavy winter snows and a warm springtime. The snowmelt causes floods. The Midwest experienced over \$6 billion of flood damage in the spring following the 2007 – 2008 event.

2. **AGRICULTURE** – This year's La Niña has created global crop problems, especially for cotton, grains and oilseeds which, combined with the sinking dollar index, is raising food costs. The US has escaped most of the dry weather problems typical of La Niñas for most

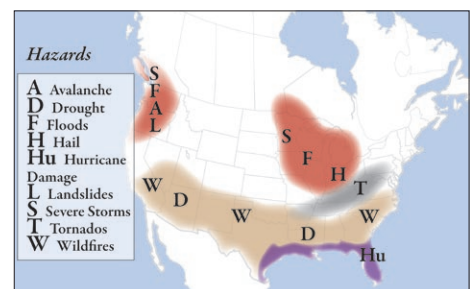


FIG. 14 **La Niña hazards for the US**

© Browning Maps

of the year, but now we are finally seeing drought in parts of nine states stretching from the Southeast to the lower Midwest, damaging crops, driving up the cost of keeping livestock and putting officials on alert for wildfires. Climatologists say the dry weather likely will continue at least until spring, raising the possibility of prolonged drought in some areas next summer.

Over the next 6 months, we can expect damaging weather to Argentina and winter crops in the Southern US. There is a higher risk of unusually intense freezes hitting the South. A combination of cold and dry weather should be stressful to livestock and winter wheat in large portions of the Southern and Central Plains.

There is some good news. La Niñas is that they usually generate a warm spring that should allow an early planting season. Additionally, while La Niñas usually create drought conditions in California, which produces about half the United States' vegetables and fruit, the Golden State is currently drought free with ample water reserves.

3. **PETROCHEMICAL AND HEATING INDUSTRIES** – This winter will probably produce some intensely cold and stormy weather concentrated in the Midwest (which heats with gas) and usually the warmest weather appears along the East Coast (which heats with oil). However, if this winter resembles other La Niñas that occurred while the Atlantic was warm, the Northeast may be unusually stormy.

4. **ELECTRICAL UTILITIES** – Typically La Niña years create two major problems for the US electrical grid. The first is line damage and power outages from the increased numbers of blizzards, ice storms and Nor'easters. The second is that the dry weather in the southern tier of states can create water shortages for hydroelectricity. Following the La Niña of 2007 – 2008, Southern utilities, especially in Tennessee, the Carolinas and Georgia had to cut back on hydroelectricity. The Tennessee Valley Authority, the largest US public utility reports that it has decreased amount of hydroelectric power being generated by over 40 %.

5. **LOCAL GOVERNMENTS** – While there will be federal aid to cover some of the difficulties caused by the upcoming La Niña, most of the problems, such as snow removal, broken pipes and potholes will have

to coped with locally. The Northwest, Great Plains, Midwest and possibly Northeast will face increased costs for snow removal and infrastructure repairs. This should drive up government expenses at a time when tax revenues are sharply down.

6. **RETAIL MARKETING** – The economy will be the main factor shaping consumer confidence and spending, but weather will also play its part. Typically, during the first quarter of a La Niña year, the cold weather forces consumers and businesses to spend more on heating, which reduces discretionary income. By spring, the weather returns to normal, even warmer than normal and weather related goods, such as gardening supplies and Bermuda shorts, sell briskly. Economic cycles are the

major factor shaping retail sales, but within that framework, La Niña years tend to see first quarters lower and second quarters higher than expected.

7. **TOURISM** – AKA – The Outlook for Skiing – If you are one of those strange people who regard plunging down a mountain at high speeds as a form of recreation – this is your year. Between the La Niña, the NAO, the AO and the overall volcanic dust, this year should provide some excellent snow for northern and western resorts. Typically Canadian, New England, New York, Colorado and Northwestern resorts have excellent snow throughout the season. In 80% of similar years, California, Utah and the Central Rockies had good snow by Christmas and throughout the rest of the season. Midwestern cross country regions can also expect good snow cover.

It is a different story for more southern resorts in the East, however. From Pennsylvania south, the Appalachians had poor or sporadic snow conditions in 60% of similar years.

Basically, the climate, the La Niña, over the next term, will cause dramatic changes in our social and economic patterns. Those who are attuned to the changes that are occurring may develop a competitive edge; and, can use the momentum of change to their advantage. If nothing else – go out and plan a good winter vacation.

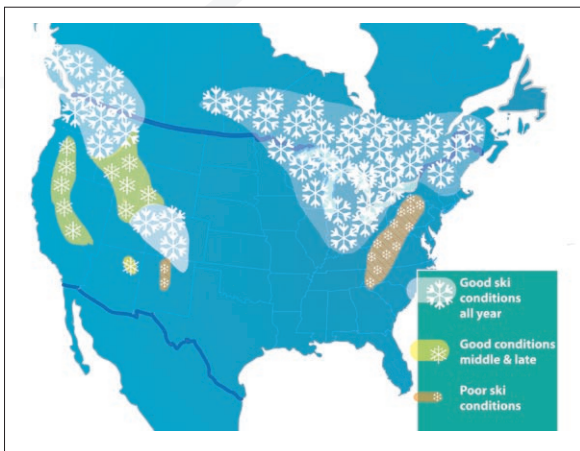




FIG. 15 **US ski conditions this winter**
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News Notes

 This summer's La Niña was too wet! HUH?!! I am a historical climatologist. The projections of this *Newsletter* are based on history and **historically summertime La Niñas cause droughts**. Because of the volcanic eruptions in the Northern Pacific and the prevailing winds carrying the ash to precipitate out on the US, the *Newsletter* defied the prevailing wisdom and predicted a good crop due to heat and sufficient rainfall in the grain belt. Unlike any of the historical records, however, this La Niña has actually had too much rain and now the US Agricultural Department forecasts a

3.8% drop in corn prices and a 2% drop in soybean.

Ironically – it was, as the *Newsletter* projected, a good crop. **The projected corn crop would still be the third-largest on record. The soybean crop will be the biggest on record. However, given the global grain problems and unexpected drop in USDA estimates this year's crop will yield the smallest surplus in 15 years.**

 Chicago is supposed to be "The Windy City" but this is ridiculous. Chicago and the Midwest has just been hit

by the strongest non-tropical storm system in recorded U.S. history. The "Great Lakes Cyclone" had the central pressure equivalent to a Category 3 hurricane surpassing even the notorious "Witch of November" storm that sank the Edmund Fitzgerald in 1975. Quite literally, the entire continent's atmosphere east of the Rockies was enveloped in this storm's circulation. Fortunately land storms do not generate the high winds that ocean storms do, so the winds were, in general, only as strong as a tropical storm with occasional gusts of 81 mph (130 kph). Even so, it has snapped trees and power lines, ripped off

roofs and delayed airplane flights as it howled across the Midwest and the South. It generated a total of 24 confirmed or suspected tornadoes.

The storm is continuing south and east as this is being written, carried by a jet stream one-third stronger than normal for this time of year. Behind it, heavy snows are falling in the Dakotas and Minnesota. It should be noted – 17% of the corn crop is still in the fields, including 45% of the North Dakota crop. The impact of this storm will be felt in the price of food and animal feed.

! Britain's *The Guardian* has published a story that illustrates how difficult global farming has been in a year that is reeling from the weather extremes of an El Niño to a La Niña. Called "Six Casualties of the World Food Crisis" it highlights how extreme weather and market forces have been raising the price of food throughout the world. Some of these are already familiar to readers – like wheat in Russia and garlic in China. Some are surprising.

Cabbage in Korea – Long-leafed Napa cabbage is a staple of the Korean diet – the main ingredient for kimchi, a spicy pickled dish served in every meal. This year, however, a frosty spring and hot summer followed by autumn floods has ruined the crop. Prices have increased between three- and fivefold with a single head of cabbage selling for 13,800 won (\$12.32 US). The shortage is starting to have political implications as people are blaming hoarders and government river projects for the shortage. President Lee Myung-bak has publically promised to only eat kimchi made from round cabbage (a major sacrifice in flavor) until the crisis ends.

Tomatoes in the Middle East – Just in case the region didn't have enough to fight about, between water shortages and religious differences – now there is a shortage of tomatoes, a staple of the Middle Eastern diet. A scorching summer killed the crop throughout the region and prices are soaring. In Israel and Palestine, the prices has risen seven- or eightfold in Israel and Palestine. In Turkey, the third biggest tomato producer in the world after China and the US, the price has tripled. Further south, in Egypt, there have been reports of street protests over the cost of tomatoes. At least we know the rioters weren't throwing rotten tomatoes.

Sugar in Pakistan – The flood waters are retreating but Pakistan's troubles continue. While emergency aid is trying to supply wheat, there is huge unrest because of a sugar shortage. Sweet milky chai (tea)

is the national drink considered by Pakistanis to be their second most important food source after bread. The price of this staple has doubled heaping misery on a country already labouring under severe flooding, power shortages, unemployment and looming economic collapse. The issue is causing considerable unrest because it is believed that politicians control prices, and much of the nation's short supply is being smuggled across the border into Afghanistan, where it fetches a higher price.

! This is a hypothetical warning. There is a possibility that this year's La Niña may be as damaging to global crops as the La Niña of 2007 – 2008. This winter's phenomenon will be the strongest in almost 70 years and like the earlier event, it is interacting with Arctic volcanism. The La Niña of 2007 led to food shortages, particularly the rice shortage, of 2008. Historically, there is only a 30% chance of this happening – but the *Newsletter* is monitoring the impact of this event on agriculture.

! Time for some good news – scientists discovered that trees are fighting air pollution. Scientists at the National Center for Atmospheric Research (NCAR) in Boulder, CO have conducted a number of studies and discovered that plants, particularly deciduous trees absorb 4 times as much air pollution as previously believed. Certain types of organic pollution, oxygenated volatile organic compounds (oVOCs), like those emitted by vehicles, form aerosols and can affect clouds and human health. Even better, when the trees were exposed to ozone and other irritating pollution, they upped their intake. Overall, "on a global level, plants are taking in 36 percent more oVOCs than had previously been accounted for in studies of atmospheric chemistry."

! Some recent climate studies are very odd. A study by National Center for Atmospheric Research (NCAR) and NOAA has concluded that aging populations can reduce greenhouse gas emission levels by up to 20 percent in some industrialized countries. This is because older populations are associated with lower labor force participation, and the resulting lower productivity leads to lower economic growth. So apparently, when you wake up in the morning with aching joints and new grey hairs, you can at least tell yourself that you are saving the planet.

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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.

VOLCANO UPDATES

Evelyn Garriss now offers an e-mail update service to notify subscribers when eruptions happen, and how they are likely to affect the weather.

For more details, price, and subscribing information: www.BrowningNewsletter.com/contact.html

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