February 2012 Vol. 37, No. 2

World Reports Covering Climate, Behavior, and Commodities Original Papers Historical Perspectives

BROWNING

©Evelyn Browning Garriss NEWSLETTER

A Fraser Management Publication

THE ICELANDIC VOLCANO, THE ICELANDIC LOW AND A VERY STRANGE WINTER

IN THIS ISSUE

- The reason that the first half of this winter was warm was that the May 2011 eruption of Mt. Grimsvötn in Iceland changed the atmospheric pressure in the North Atlantic. This altered the oscillations in the Arctic and North Atlantic so much that they overruled almost all cooling from the La Niña.
- The Arctic Oscillation became positive, pinning the cold Arctic air in the north for the first half of winter. It has turned negative and is letting freezing weather hit Europe, damaging winter wheat crops.
- The North Atlantic Oscillation became positive, helping to pin the Arctic air in the north. It is now rotating between positive and neutral, allowing occasional cold in North America for brief spells.
- Without the Icelandic effect, the La Niña has had its full impact in the Southern Hemisphere. Larger cycles in the Pacific have strengthened the weather impact of the moderate La Niña.
- The La Niña has created drought and crop problems in South America, heat and floods in Australia and decent growing conditions in large areas of Southern Africa.

SUMMARY

What happened to the cold winter? Blame the huge eruption in May 2011 of Mt. Grimsvötn in Iceland, which distorted the atmospheric pressure in the North Atlantic. This in turn has altered Arctic and Atlantic weather patterns, trapping most of the cold polar air mass to the north. While conditions are becoming more neutral, we will continue to see warmer than normal conditions in the East through spring.

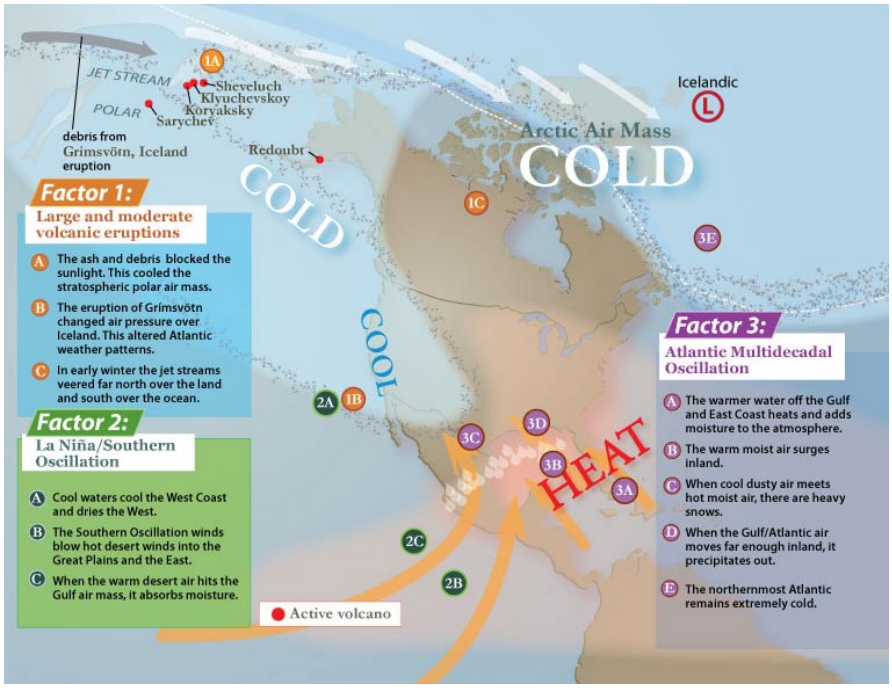


fig. 1 **The First Half of Winter 2011/2012**

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.

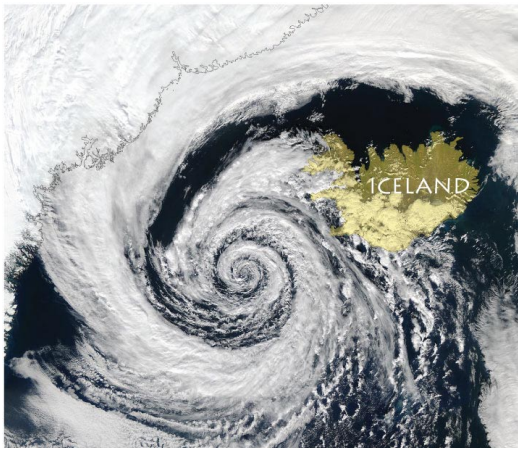


fig. 2 **A cold-core polar cyclone on the Icelandic Low** *courtesy: NASA*

After two giant volcanoes in Russia and Alaska blasted into the stratosphere in 2009, they cooled the polar air mass. This distorted air pressure and wind patterns and caused two terrible winters in North America.

I jokingly told my shivering clients to blame Russia and its volcano. It was the new "Cold War".

Last year we had two major eruptions – Sheveluch in Russia and Grimsvötn in Iceland. These also cooled the polar air mass. They distorted Arctic air patterns. While Alaska is buried in 27 feet of snow, the best snow for skiing in the US is in New Mexico. Meanwhile Most of the Central and Western US has basked in unusually warm temperatures.

I tell my clients to blame the volcano in Iceland. I am not joking.

This is the first time since 1783/84 (in the middle of the Little Ice Age) that we have had a large eruption in both the North Pacific and the North Atlantic. An eruption in either area produces a cold North American winter over 80% of the time. Together, they have produced a unique winter pattern.

During the first half of winter, most of the cooler weather went into the oceans. The North American and European landmasses were left relatively warm.

Overview

The North American winter is shaped by air masses coming from the Pacific, the Arctic and the Atlantic/Gulf of Mexico.

- **THE PACIFIC** – The Pacific is dominated by a cool tropical La Niña. This is creating cool, dry conditions in the West.
- **THE ARCTIC** – The Arctic Oscillation determines how much cold polar air enters Canada and the US.
- **THE ATLANTIC/GULF OF MEXICO** – The North Atlantic Oscillation determines if any of that cold polar air enters the central and eastern portions of North America. It also determines how long that cold air will linger. Meanwhile warm air enters the continent from the Gulf of Mexico.

Importantly, two of the three air masses are shaped by the **Icelandic Low**. This year the Icelandic Low was shaped by the Icelandic volcano.

The Icelandic Low

Iceland has a special place in the weather world. It is home of the Icelandic Low. Just like the summertime Bermuda High, which determines hurricane paths, this pressure area steers storms. It determines how many winter storms will enter the lands around the Atlantic Ocean.

The Icelandic Low is a permanent area of low atmospheric pressure. It is located (as the name implies) near Iceland. Sometimes it drifts west, towards Greenland; sometimes it drifts east towards northern Norway.

The Icelandic Low is a major factor for shaping wind directions in the North Atlantic – particularly the polar jetstream. This strong stream of winds controls the Arctic air. It either traps the air mass north or steers the freezing winds south.

This past year, the Icelandic Low was warped by the huge eruption of an Icelandic volcano. On 21 May 2011, Grímsvötn erupted and poured ash and chemicals 15 to 20 km. (9.3 to 12.4 miles) into the atmosphere. At that time, Europe rejoiced the debris was high and air traffic unaffected while I said "oh no". This debris entered the stratosphere and reflected

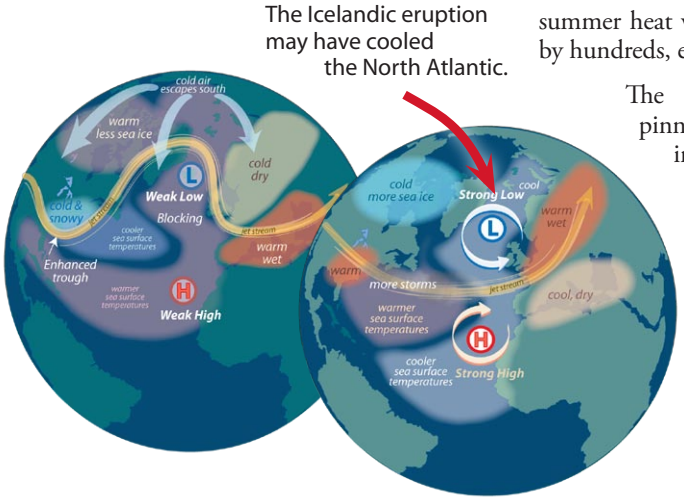
fig. 3 **Blame it on Grimsvötn!**
© Browning Newsletter

the incoming sunlight. This cooled the entire Arctic, but the major impact was felt in the North Atlantic. The cooler, denser air altered air pressure and the Icelandic Low has been very strong. We are still feeling the effects. Since it typically takes 2 – 3 years for the ash to fall out, we will feel the impact for a long time.

This distortion is shaping two huge winter weather patterns – the North Atlantic Oscillation **(NAO)** and the Arctic Oscillation **(AO)**. There is a strong probability that they will reappear frequently and continue distorting the weather of 2012.

The North Atlantic Oscillation (NAO)

The NAO is a short-lived cycle that normally takes a few days to a few months to go from positive to negative and back again. It is shaped by the Icelandic Low and a permanent high air-pressure system over



figs. 4-5 **Normally a warm, positive AMO creates a negative NAO. This year the North Atlantic is cooler.** *© Browning Maps*

the Azores, the Azores High. These control the strength and direction of winds around the Atlantic Ocean and its surrounding land masses. The strength of these air pressures varies.

POSITIVE NAO – When there is a strong difference between the Icelandic Low and the Azores High, the two channel the path of the middle-latitude westerly winds blowing across the Atlantic. The westerlies are strong and straight blasting marine air and moisture deep into Europe, North Africa and the Middle East. They trap cold Arctic air, forcing it to stay north.

NEGATIVE NAO – When there is very little difference between the air pressures, the westerlies are weaker and they wander north and south. Cold Arctic air can slam south in the winter and hot tropical air can boil into northern latitudes during summer. The eastern regions of North America and most of Europe suffer stormier winters and summer heat waves. Rainfall patterns shift by hundreds, even thousands, of miles.

The cold Arctic air has been pinned. Thanks to volcanic cooling, the Icelandic region is cold and the Icelandic Low became very low and very strong. During December 2011, the NAO index was +2.52, which was the most extreme difference in pressure between Iceland and the Azores ever observed in December since records began in 1865. So the Eastern US and Europe experienced an extraordinarily warm December, and the first week in January was the driest in US recorded history!

Normally the NAO switches several times a year, even several times a season. However, it does seem to be related to a much longer-lasting ocean cycle – the 70-year-long Atlantic Multidecadal Oscillation.

ATLANTIC MULTI-DECADAL OSCILLATION (AMO) is the northward flow of the Atlantic's ocean currents, including the Gulf Stream. Ocean currents, like rivers, have periods of rapid flow and times when the current slows down. History shows that Atlantic waters flow rapidly for roughly 40 years, carrying the tropical water north. The Atlantic becomes very warm. Then gradually the waters slow down and the ocean cools. The cooler period typical lasts for about 30 years.

As the NAO graphic shows, the different air pressures are related to the temperature of the Atlantic Ocean's waters. In 1995, the Gulf Stream began to flow faster, temperatures warmed in North Atlantic waters and the negative NAO became the norm.

The Gulf Stream is still flowing rapidly. By mid-January, the waters warmed slightly and the Icelandic Low weakened. The NAO became neutral on January 12. Cold air escaped from the Arctic. Then once again the volcanic cooling reasserted itself and the NAO became positive. [The neutral NAO has let extremely cold air hit Europe, particularly Eastern Europe. See NEWS NOTES].

CURRENT OUTLOOK – The Icelandic Low is a battleground. Volcanic forces are increasing it and warm Atlantic currents are lowering it. Expect the NAO to fluctuate between positive and neutral. Overall, this will lead to warm temperatures with quick cold fronts sweeping through, followed by equally quick thaws.

The Arctic Oscillation (AO)

Like the North Atlantic Oscillation, the Arctic Oscillation (AO) is shaped by the Icelandic Low. When the Icelandic Low is strong, the AO cannot pour cold Arctic air into most of North America or Europe.

The Arctic Oscillation is the speed of the winds circling the polar air mass. These winds blow from west to east, and their strength oscillates from very strong (a positive AO) to extremely week (a negative AO).This strength is determined by the north-south differences in air pressure.

NEGATIVE AO – When there is not much difference between the air pressures of the polar regions and the northern mid-latitudes (which is common when the Northern Atlantic is abnormally warm all the way up to Iceland), these polar winds are weak. Cold Arctic air escapes to the south. As the air escapes 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.

POSITIVE AO – When the AO is positive, the winds are strong and trap the Arctic air mass north of 55°N. That's north of Edinburgh, Moscow, and the southern tip of Alaska. This means the polar regions remain very cold and, in general, the Arctic sea ice is compressed together. The almost solid sheet of ice tends to reflect incoming sunlight back into space before it can do much warming. As a result, the North Pole tends to be very cold and the regions south of 55°N are relatively warm.

Sound familiar? That is the story of this winter.

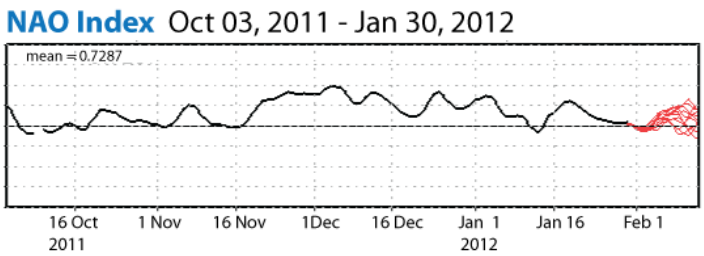


fig. 6 A positive NAO means warm weather in middle & eastern North America *http://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/nao.sprd2.gif*

While the Icelandic Low is one of the major factors shaping the Arctic Oscillation, it is not the only one. Forces in the Pacific, including the Aleutian Low and La Niña finally forced the polar winds to weaken, especially over parts of Asia. On Jan 22, the AO finally became negative and cold polar air finally began to escape south. Cold fronts plunged south, and then rapidly swept east. With a neutral NAO, none of the storms lingered, but winter had finally begun.

CURRENT OUTLOOK – The volcanic strengthening of the Icelandic Low are encouraging the AO to return to neutral. Normally, with the La Niña and last year's eruption of Russia's Mt. Sheveluch, the AO would be severely negative, but the eruption of Grimsvötn in Iceland was huge. Expect the AO to be extremely variable for the rest of winter.

Analysis of a Warm Winter

This winter has been shaped by three factors:

- A moderate La Niña that weakened in December and regained strength in January.
- An Atlantic that has been warm in the tropics and, thanks to Grimsvötn, cool in the north. The cool temperatures strengthen the Icelandic Low. This has produced a variable Arctic Oscillation that was positive through most of December and January.
- The same conditions in the Atlantic have produced the most positive NAO on record. The NAO now wavers between neutral and positive. This means any cold front that enters North America is not blocked. Instead of lingering, it is quickly swept out to sea.

For Alaska, this combination has been disastrous for Alaska. Temperatures have been cold, even by Alaskan standards, with Fairbanks in the south hitting -50˚F (-45.6˚ C). (Jim River, Alaska almost hit -80˚F (-62.2˚C), the all-time record coldest temperature for the entire United States, then the weather station's battery died just at the critical moment.) Meanwhile the state has been buried with an average of 18 – 27 feet (5.5 – 8.2 meters). Towns are stranded, roofs are collapsing and avalanches have closed state highways. Nome, Alaska was cut off from the rest of the world by sea ice and storms before the usual pre-winter fuel delivery. It took the U.S. Coast Guard and a tough Russian tanker to make an emergency mid-winter delivery before the city's fuel supplies ran out. Indeed, one of the current concerns in Alaska is that the surrounding sea ice is growing at record rates – good news for polar bears but lousy for fishing fleets.

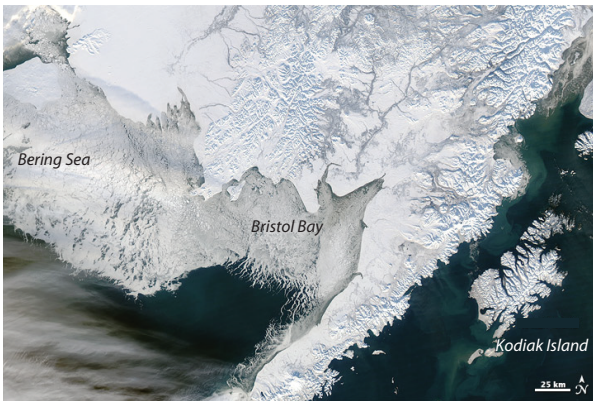


fig. 7 **It's Back! The Sea Ice is growing at record rates around Alaska.**
source: http://earthobservatory.nasa.gov/IOTD/view.php?id=76989

Meanwhile further south, the US and Canada had extraordinarily warm winters. Parts of Canada and the northern USA that normally would have winter storms basked in temperatures more than 5˚C (9˚F) above normal.

Droughts

The continued sunny skies have brought drought. Currently 58.20% of the contiguous US is dry and 36.21% is in drought. The second La Niña winter in a row increased the national drought by 18% over this time last year. The good news is the temperatures have been enjoyable, especially for consumers who have saved on their heating bills.

The area of greatest concern is the increasing drought in the West, particularly in California. In most Western states, snowpack provides 60–80% of all water. This year, largely as a result of the La Niña and the long-term Pacific Decadal Oscillation, the Western snowpack is 73-81% below normal. It is particularly lacking in the Colorado River Basin, the source of water for much of Southern California. California as a whole has experienced its second driest December on record and the drought continued until a short, freezing mid-winter storm.

Fortunately, most Western reservoirs are still filled water from last year's bountiful snow. There will be water, but unfortunately, politics sometimes intrude into portioning out the shares. As Californians say, "Water flows towards the money." Typically, hydroelectricity ranks last and a Beverly Hills golf course trumps everything.

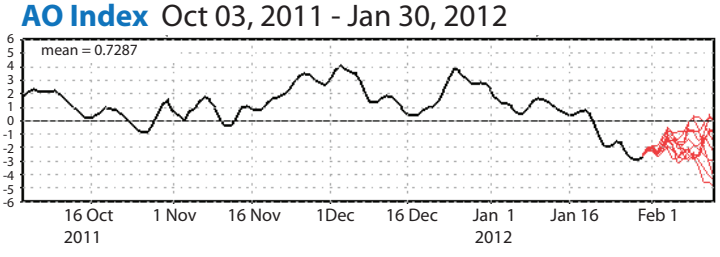


fig. 8 A positive NAO means warm weather in middle & eastern North America *http://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/nao.sprd2.gif*

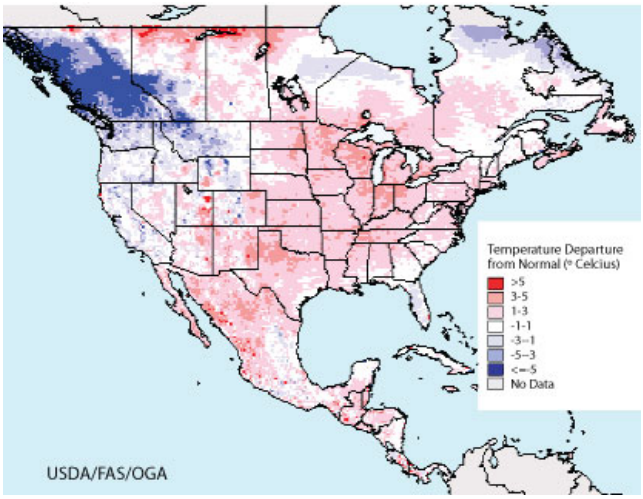


fig. 9 **North American temperature anomalies** *Jan 1-10*
http://www.pecad.fas.usda.gov/cropexplorer/continentView.cfm?ftypeid=24&fattributeid=5&stypeid=24&sattributeid=16&regionid=namerica&startdate=01%2F01%2F12&imenddate=01%2F10%2F12

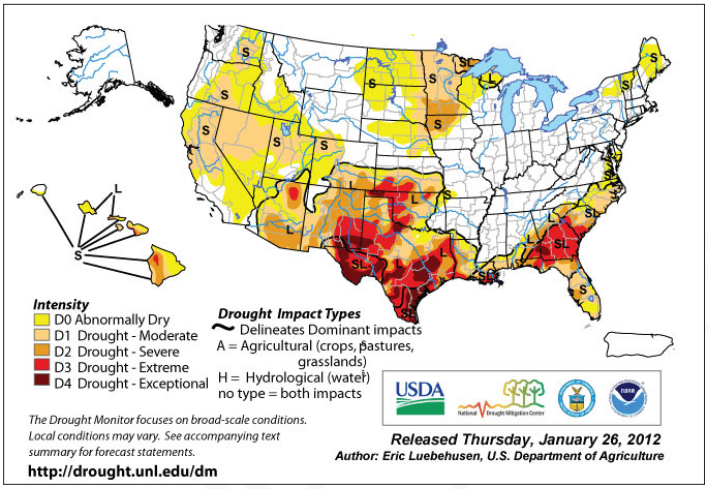


fig.10 **US Drought Monitor** *Jan 24* **58% of the contiguous US is in drought**

http://droughtmonitor.unl.edu/

One bit of good weather news is that large portions of the Southern Plains had between 150 – 300% of their normal precipitation. It is telling that even with all this moisture, Texas only changed from having 100% of its territory in drought to 99.4% dry and 95.1% remaining in drought.

Canada is also facing water concerns. During December, El Paso, Texas on the Mexican border had more snow than Toronto, Ontario. Since then, most of the Eastern Provinces have received near normal precipitation but the Prairie Provinces have not. Large portions of Alberta, Saskatchewan and Manitoba have received less than 40% of their normal precipitation and most of the West has received less than 60%. While these areas have months before planting time, the dry autumn and the continued dry weather this winter means that, without heavy snow or rain before April and May, spring planting conditions will be dry.

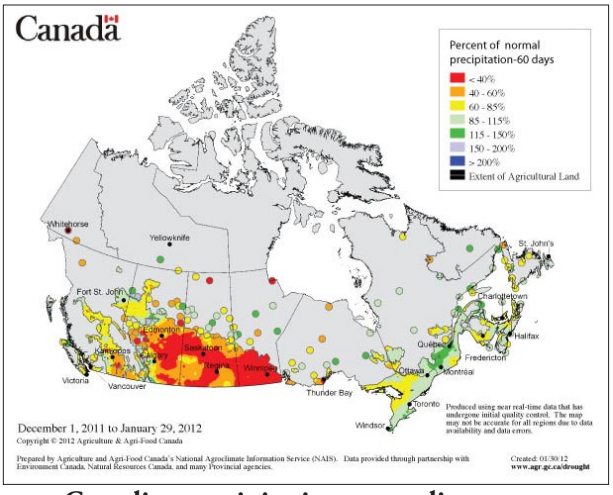


fig. 11 **Canadian precipitation anomalies** *Dec 1-Jan29*

http://www4.agr.gc.ca/resources/prod/doc/pfra/maps/nrt/nl_60_av_s_e.pdf

Looking Ahead

As a historic climatologist, I found it is impossible to find a record of a year that has exactly the same factors shaping the climate as currently exist. Sometimes we have entire decades without a volcano eruptions large enough to enter the stratosphere. Since 2009, we have had five eruptions, all in polar regions. Even if one assumes that the two eruptions in 2009 have precipitated out and the eruption in Chile will not affect the Northern Hemisphere, we are still left with very unusual conditions. As noted earlier, the last time large volcanoes erupted in both the North Pacific and North Atlantic was 1783/84, during the Little Ice Age.

The La Niña, which weakened in December, strengthened in January. It seemed to have peaked around January 20 and remained moderate. Currently the cooled pool of water in the central Tropical Pacific is moderate (1.2˚C or 2.2˚F below normal) and weak (0.7˚C or 1.3˚F) in the east. Most models around the world expect the phenomenon to fade through late winter and early spring. The Pacific is expected to be neutral by mid to late spring. The experts are then divided on whether the ocean will warm, remain neutral or cool again in autumn.

Meanwhile both the Arctic Oscillation and the North Atlantic Oscillation will continue to be pressured to return to neutral and/or positive values. This should speed the retreat of winter weather. At the same time, the rapidly flowing Atlantic current will rapidly heat up the Gulf and East Coast.

When the weakening La Niña is combined with the complex conditions in the Atlantic, we have seen the following conditions.

LATE WINTER – In 80% of similar years, warmth from the Gulf of Mexico and the Tropical Atlantic wells up through the South and East Coast as well as the Atlantic Provinces. The only portion of the continent at risk for cooler weather is in the Pacific Northwest. The West, particularly the Southwest, normally has problems with dry weather, while the Great Lakes

Cool	Cold	Warm	Dry	Wet
2˚C or more lower than normal temps.	5˚C or more lower 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.12-14 * Moderate eruptions in the Pacific Northwest will bring more moisture to the west.

and portions of the Mid-Atlantic and Northeast have a high probability of above average moisture.

EARLY SPRING – In 80% of similar years, the Midwest and portions of the Pacific Northwest experienced cooler than average conditions. Large portions of the Southwest and the Northern Plains/Prairie Provinces normally have dry conditions, while most of the East experiences above average rainfall.

MID SPRING – Typically, the western Canadian/US border region has drier, cooler weather that interferes with spring planting. In most years, the Great Lakes and Midwest also experience above average moisture that also causes delayed planting. (In 60% of these years, there is flooding in portions of Manitoba and Minnesota.) The heavy rains are spread from the Central Plains to the Upper South. Meanwhile, the Southwest, particularly the Southern California and the Colorado River, has low snowpack and continued drought.

In short, the same factors that have shaped an unusual winter will create a pleasant spring. However, the weather will present problems for spring planting and challenges for Western water supplies. Enjoy the pleasant weather; there is a real risk of heat and water problems in summer. Summer, like the upcoming spring and the strange winter of 2011/2012, will be shaped by the results of Iceland's Grimsvötn and the Icelandic Low.

THE WEATHER DOWN UNDER

SUMMARY

The La Niña in the Pacific has peaked and is being fully felt in the Southern Hemisphere. This has created drought in South American croplands, extreme heat in Australia and decent conditions for Southern Africa.

The impact of the Grimsvötn eruption may have been powerful, but its impact is limited. Global winds tend to keep polar air masses confined to their own hemisphere. If you are basking in the warm Australian summer sunshine, you really do not have to worry about the Icelandic Low.

You do have to be concerned about the La Niña. The tropical event typically cools the Eastern Pacific and warms the western waters. This has a profound effect on precipitation on both sides of the ocean.

In South America, the results have been extremely negative for rainfall. The cooler waters off the West Coast of the continent cool the air and colder air holds less moisture. When the prevailing winds carry the drier air inland, large parts of the continent, particularly Chile, Argentina and parts of the Andes experience season long droughts.

This effect has been enhanced by larger and longer-lasting trends in the Pacific. Originally called the Pacific Decadal Oscillation and now called the Interdecadal Pacific Oscillation, (the Pacific Decadal Oscillation is now commonly used only for the North Pacific), this trend is moving more of the cooler water to the Eastern Pacific. When this is added to the La Niña, which is doing the same thing, it is strengthening the events impact. A moderate La Niña, with the larger trend, is having the impact of a strong event in South America.

Normally a La Niña would bring drier conditions to the Andes. They would receive less snowpack, which would affect the flow of rivers, such as the Amazon and La Plata, with headwaters in the mountains. In a strong La Niña, the dry weather would extend into Argentina and even portions of Southern Brazil.

Despite the fact that this year's La Niña is only moderate, it is hitting South America strongly. To make it worse, this is the second event in a row; so many areas are already feeling shortfalls. We are seeing moisture shortfalls throughout Argentina, parts of Southern Brazil and the Amazon River Basin. Satellite photos of the continents plant growth indicate how severely this has affected the summer growing season. By mid-January, Brazil and Argentina had already lost 11 million metric tons of corn due to irreversible drought damage.

While the drought is not as intense as last year, it is more wide spread and may have already inflicted more crop damage. With La Niña expected to fade in late February and probably be neutral by late April, the late growing season for Brazil and Argentina should see more rainfall. Unfortunately, some of this rain may be during harvest season. Expect concerns over these corn and soybean crops to last the entire season.

Further west, Australia is also being hit with a larger than normal impact for a moderate La Niña. For Oz, however, the La Niña brings rain, not drought. (Remember last year's floods?) One of the characteristics of the phenomenon is that it creates stronger east-to-west trade winds. The winds ruffle the surface of the Pacific, pushing the sun-warmed surface waters westward. More and more warm waters pile up in the western side of the ocean, resulting in measurably higher ocean levels and higher temperatures around Southeast Asia and parts of Australia.

Most English speaking parents have

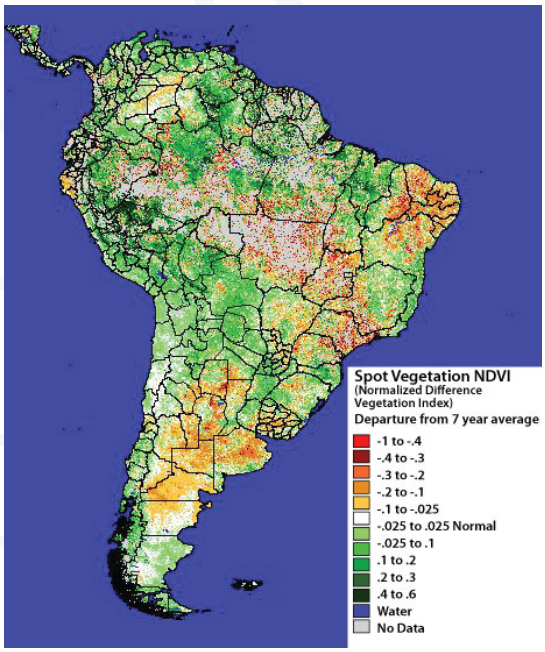


fig. 15 **South American short term vegetation index**

Jan 11-20 http://www.pecad.fas.usda.gov/cropexplorer/continentView.cfm?ftypeid=4&fattributeid=1&stypeid=4&sattributeid=3&regionid=samerica&startdate=01%2F11%2F12&imenddate=01%2F20%2F12

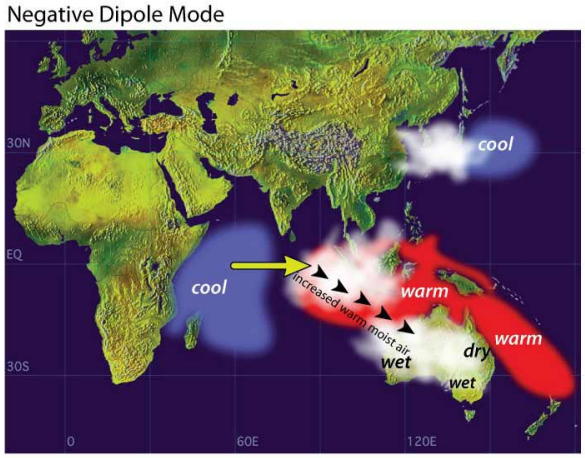


fig. 16 **The Indian Ocean Dipole is neutral but is expected to become mildly negative in springtime.** *www.jamstec.go.jp/frsgc/research/d1/iod/*

had to watch "Finding Nemo" with their kids, and are familiar with the East Australia Current, the warm tropical current that flows along the east coast of the continent (and has really cool turtles). This current warms the Eastern Australia and there is some research that suggests the flow is heavier during La Niñas.

The result is predictable. Australia had a record-breaking heat waves this January, with temperatures rising to 40˚C (104˚F) in much of the country and a second, even hotter heat wave in Perth and the western portions of the continent towards the end of the month. It has set a huge number of wildfires.

Australia's climate, like North America, is shaped by two oceans. In the case of the southern continent, the oceans are the Pacific and the Indian Ocean. Like the Atlantic and Pacific, the Indian Ocean has an oscillation that swings the warmer water to different areas. This swing is the Indian Ocean Dipole (IOD), which moves the best monsoons from the east to the west and back again.

Currently, the IOD is neutral. It is expected to become slightly negative sometime around March to May, (according to the Japan Agency for Marine-Earth Science and Technology) which will strengthen the rains during the last stages of the monsoon.

While the IOD is not affecting the rainfall at the moment, the La Niña certainly is. Monsoon winds flow from cool to warm, which in summer means from cooler waters into warmer landmasses. With the scorching summer heat, the current summer monsoon is very strong. It is penetrating deep inland, across from the Northeast to the Southwest. It has caused flooding from Perth in the West to Queensland and New South Wales in the East. Some areas, like Sydney, have had so much rain that, while most of Australia was hot, they were cool.

The situation is not as severe this year as it was last year, but it is still having an impact. This has already affected coal prices. Australia accounts for almost two-thirds of the global coking coal trade. The flooding is having a heavier impact on the eastern regions, where much of the infrastructure, including railroads necessary for coal transport, was built during the prolonged "Big Dry." The impact is not as severe in the western state's iron production, but that area has different problems. On January 12, Tropical cyclone Heidi lashed the west Australian coast on Thursday packing winds up to 120 km per hour (75 mph), forcing seaside residents to flee rising tidewaters and closing the world's biggest iron ore export terminals.

The Aussie farmers are tough. They made a good crop last year, despite the terrible floods and will probably be just as successful this year.

Across the Indian Ocean are the farmlands of Southern Africa. Like Australia, Southern African lands are shaped by the Indian Ocean and the Pacific but they are also are at the mercy of the Atlantic. The La Niña typically brings bountiful rain to most of southern and eastern Africa, with the exception of frequent droughts in the heavily populated lands around Lake Victoria. The fast flowing waters of the Atlantic usually brings more rainfall to Southern Africa. Meanwhile the Indian Ocean is neutral. All of this is good news for Southern African crops. There may be some drier weather in a couple of months, when the Indian Ocean Dipole will turn slightly negative and the La Niña fades, but that will be during the harvest.

Overall, the La Niña will have a strong impact on Southern Hemisphere food and coal production, but not as severe as last year. The eruption of a volcano in Iceland may have blunted the impact of the event in the Northern Hemisphere, but south of the equator – La Niña rules!

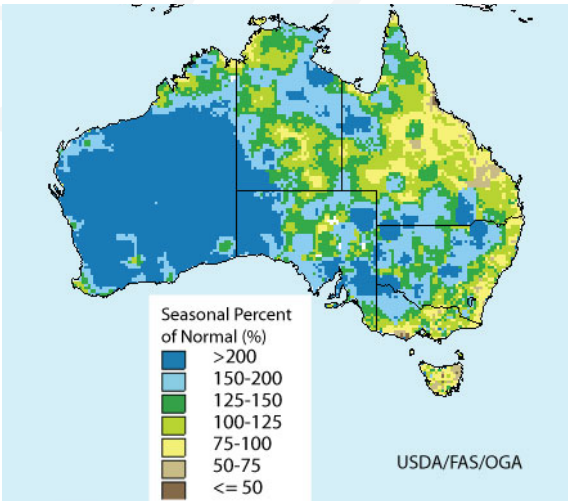


fig. 17 **Australia's seasonal precipitation anomalies** *Oct 10-Jan 20*
http://www.pecad.fas.usda.gov/cropexplorer/imageview2.cfm?ftypeid=23&fattributeid=8&stypeid=&sattributeid=&startdate=2012-01-11%2000%3A00%3A00.0&imenddate=2012-01-20%2000%3A00%3A00.0&regionid=as

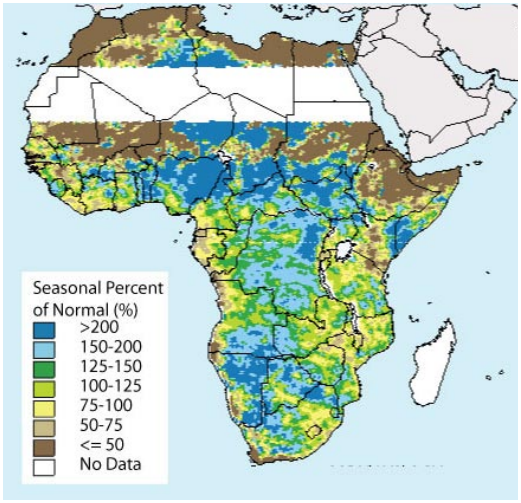


fig. 18 **Africa's precipitation anomalies** *Jan 11-20* *http://www.pecad.fas.usda.gov/cropexplorer/continentView.cfm?ftypeid=12&fattributeid=8&stypeid=&sattributeid=&startdate=2012-01-11%2000%3A00%3A00.0&imenddate=2012-01-20%2000%3A00%3A00.0&regionid=africa*

News Notes

Beware the "Beast from the East", the huge wave of freezing weather hitting Europe. When the Arctic Oscillation finally became negative during the second half of January, it allowed freezing air to surge south. The neutral NAO meant the air plunged south in Russia and Eastern Europe, rather than Western Europe. At least 44 people have died from the cold in Poland, Ukraine and the Balkans. Tens of thousands have had to move to shelters as temperatures plunged. The Ukraine is experiencing its coldest winter in six years and Poland has seen nights drop to -30°C (-22°F). The cold spread east and now Great Britain, with nighttime temperatures at -11°C (-12°F) is colder than Iceland.

What has made this cold spell so severe is that the first half of winter, when the NAO was positive, was unusually mild. This has allowed winter crops, like winter wheat in Russia, to become more advanced than normal. The lack of snow cover and the advanced state of the wheat has allowed crops to sustain frost damage. While economists note that the cold snap will have a limited impact on the heating oil market, it is bullish for natural gas. Wheat prices have risen and Russia is considering a protective grain export duty.

Like the United States, China's biggest weather problem this winter was dry conditions in its southern tier. The North had a prolonged wet season monsoon, with good rain through November. For the South, however, the weak South China Sea monsoon meant a shortage of rain. A weak monsoon does not penetrate as deeply into the continent, and this year it left Southwest China very dry. This is a problem, since this region feeds the headwaters of the Yangtze, Pearl, Mekong, Irrawaddy and Brahmaputra Rivers.

The drought continued during the monsoon's dry season as well. By mid-January, Poyang Lake, China's largest freshwater lake and home to a rare finless porpoise, has shrunk to half its size. Articles mentioned that areas had drought from last July to this January.

Now the official word is that no part of China has drought. Some areas still look quite dry when viewing satellite pictures, but it's official – no drought. Nothing to see here. Move right along.

The drought in Texas has spread deep into northern Mexico. This has not only hurt corn, the normally well-tended crops of marijuana and opium. (This is amazing – the opium poppy is extremely drought resistant.) However, it has not dried up demand and now cartels are ramping up their production of synthetic drugs. Authorities report an explosive growth of meth labs.

We may be getting off lightly. A new article by Gifford Miller et. al. in the 31 January in issue of ***Geophysical Research Letters,*** reports that an episode of volcano eruptions may have caused the "Little Ice Age." The new study by scientists from Colorado, California, Iceland and Scotland suggests that the onset of the little Ice Age was caused by an unusual, 50-year-long episode of four massive tropical volcanic eruptions that started in 1273.

Scientists found indications of tremendous growth of Arctic sea ice at the time these volcanoes exploded. Climate models suggest the sea ice expanded along the east coast of Greenland and out into the Atlantic. As it melted, it freshened the northern waters until they were unable to mix with deeper North Atlantic water. This dramatically slowed the flow of the Gulf Stream, stopping the northern flow of tropical weather. This in turn, cooled the northern climate even further. It became a self-sustaining feedback loop long after the effects of the volcanic aerosols subsided What started as a series of volcano eruptions evolved into a long-time impact on ocean currents that took centuries to correct.

The scientists suggest that this cooling took place independent of solar cooling. If they are right, then Alaska may be lucky to be getting only 27 feet of snow this year!

It has to be one of the strangest weather phenomena of the decade. A Bournemouth, England resident was rained on by marble-sized balls of blue jelly. When he gingerly collected the slime, the Bournemouth University reported that they appeared to be fish eggs. Unfortunately, it was slimy blue mystery eggs, not caviar.

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

The **Browning Newsletter** is published monthly at an annual subscription rate of $250 for print OR email version, $270 for both formats. Subscriptions should be directed to:

The Browning Newsletter
PO Box 1777
Burlington, VT 05402

1-802-658-0322
alex@fraser.com