

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.

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 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.

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The Eruption of an Unpronounceable Volcano

SUMMARY: While the eruption of Eyjafjallajökull has had a major impact on air travel, it has had relatively little effect on climate. However, there is a potential for greater explosions in Iceland.

The headlines read “Chaos!”, “No end in sight for havoc of Icelandic volcano” and “Iceland Volcano Eruption – Trauma to Continue Further!” Perhaps the most ironic was “The Day the Earth Stood Still!”

The problem is that the Earth isn’t standing still. In the past few months we have seen four huge and deadly earthquakes, in Haiti, Chile, Mexico and China. Volcanoes have been exploding. Indeed, Mt. Eyjafjallajökull (EYE-a-fyat-la-jo-kuh-duhl) isn’t even the largest eruption this year. The Icelandic volcano is blowing debris from 6 to 11 km. (3.7 – 6.8 miles) above sea level. On February 11, Soufrière Hills, on Montserrat Island in the Caribbean, exploded 15 km (9.3 miles) high.

Just remember, when the Earth is turbulent, so is the weather. The clouds of ash in the atmosphere don’t just interfere with aviation. They block out incoming sunlight, seed clouds, change air pressure and wind patterns and ultimately fall to the earth in the form of acid rain.

In other words, if you thought this winter was strange, wait until you experience spring and summer.

Restless Volcanoes

The cold winter of 2009 – 2010 was supposed to be warm. Models showed an El Niño in the Pacific, which normally brings warm, almost benign weather. Unfortunately the models did not incorporate the impact of the active volcanoes of the North Pacific. The volcanic ash left over from the giant eruptions of Alaska’s Mt. Redoubt and Russia’s Sarychev Peak in 2009 still lingered in the Arctic air mass. Mt. Sheveluch on Russia’s Kamchatka Peninsula had a prolonged series of low and medium-sized explosions that cooled passing



March 25



April 19

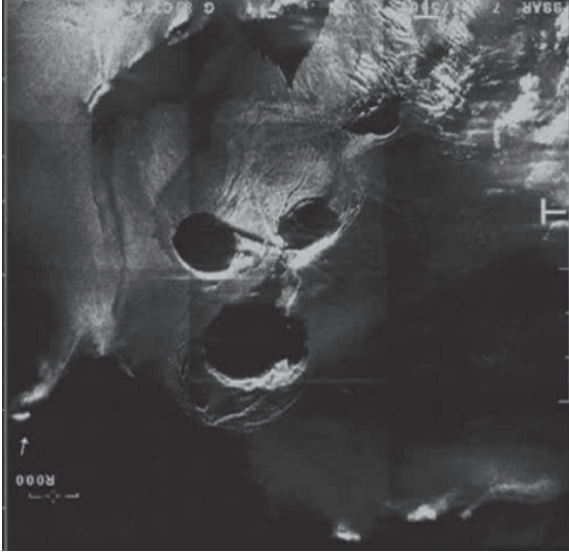


fig. 3 Radar Observations at the Eyjafjallajökull Eruption site April 15

http://www.earthice.hi.is/page/ies_Eyjafjallajokull_eruption?74,23

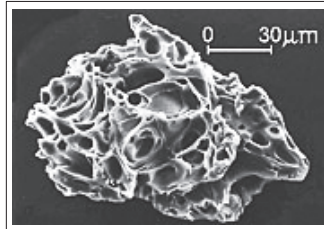


fig. 4 Volcanic ash particles are tiny and glassy

http://en.wikipedia.org/wiki/File:Ashsem_small.jpg

cold fronts. The chemicals and debris from these eruptions cooled the winter weather and finally precipitated out, setting thousands of North American precipitation records.

The Northern Pacific began to quiet down in mid-February. As the Arctic activity quieted, the warm El Niño in the Pacific was allowed to waft its warmth into North America. Most of Canada experienced temperatures +5°C (9°F) while the southern states experienced normal El Niño moisture. Throughout most of March and April, El Niño has shaped and dominated the weather of North America. Even the February 11 and March 25 eruptions of Soufrière Hills on Montserrat Island in the Caribbean did little to disturb this pattern. Indeed, by adding ash to seed clouds off the East Coast, the eruptions may have enhanced the event's impact on the US.

Then in mid-March, the Arctic woke up again. On March 20 Eyjafjallajökull in Iceland began to erupt for the first time in 200 years. The eruption was small, similar to the volcanoes of Hawaii, with lava leaking out of a crack in the ground rather than shooting out from a volcano crater. The lava melted a nearby glacier, forcing five hundred people to evacuate the area for a few days. As the eruption continued, people returned home. Tourists trotted

over to the cracks to take pretty pictures. The glacier ice melted over the hot spots, forming an eerie face when seen from above. Scientists continued to monitor it, concerned that this small eruption could lead to something larger. It did.

On April 14 Eyjafjallajökull opened a new vent. The explosion, at the mountain's top crater was 10 to 20 times greater than the earlier eruptions. Ash and debris were blown 6 to 11 km (3.7 – 6.8 miles) into the sky. Melting ice and mud flowed down the slope of the volcano, causing the water level of nearby rivers to rise by ten feet. Iceland's coastal highway was closed and 800 residents were evacuated, including 70 people who were stranded in a valley.

Ashes and Aircraft

What grabbed international attention, however, was the impact on air travel. The problem is that everything in Europe is so close. Iceland is only 1000 miles (1610 km) from Liverpool, England. That is the same distance from Boston to Chicago and about 200 miles less than the distance between Halifax and Toronto. Even a medium-sized eruption could impact a multitude of nations, each with their own separate aviation policies. The ash soared through the

skies stretching across 24 countries, from Newfoundland, Canada to Russia. Twenty-seven major hub airports were closed for days. **Airlines grounded 100,000 flights, stranding 7 million people and cost 1.7 billion dollars in the process.**

The airport closures affected not only the mobility of people but that of fresh vegetables and fruit, grains and other food, medicine, machinery parts and more. (One of the more pathetic casualties of this has been the Kenyan flower industry, which has had hundreds of tons of flowers rotting in warehouses, unable to go to European markets.) Beyond this regional impact, an April 23 study by Northwestern University professor Dirk Brockmann and associates has shown the effect on the world's transportation. European airports are bridges to the world -- the majority of global air traffic goes through Europe. Distant airports, particularly Singapore, Hong Kong, Beijing and Mumbai depend heavily on European hubs for flights, not only for travel to Europe, but also to Africa, the Middle East and eastern North America. As the study shows – global travel that normally took only two connections took four or five, at greatly increased costs.

Experts now report that while the airline industry has borne the brunt of the financial impact, the wider economy is also estimated to have suffered \$770 million in lost business and disruption.

Problems with volcanic debris are not unprecedented. Airlines have been dealing with volcanic eruptions for decades. They are painfully aware that volcanic ash is composed of acidic chemicals and jagged rock. The debris sandblasts airplanes, clogs engines and, since it is electrically charged, causes massive short-outs. Since 1980 about 5 airports a year have been affected by eruptions. **The largest number of closures has occurred at Catania (Sicily), Anchorage (Alaska), Quito (Ecuador), and Tokua (Papua New Guinea). Despite these precautions, there have been at least 100 incidents involving aircraft and volcanic ash emissions over the past 40 years.**

In short, airlines have great experience dealing with volcanic ash. As recently as last April, Anchorage airport continued to

operate most of the time that Mt. Redoubt was erupting 106 miles (170 km) away.

Airlines may be experienced – but most European officials were not. The last large volcano event in Europe was 1918, before commercial aviation. **Unfortunately, the continent’s safety procedures on volcanic ash date from the 1980s.** After both a British Airways above Indonesia and a KLM jet over Alaska lost power flying through volcanic ash, officials set up a **zero** tolerance policy. Under plans developed under the auspices of the UN’s Civil Aviation Organization, if there is any ash present, airspace is restricted. The presence of ash was determined by VAAC (Volcanic Ash Advisory Centre) models with no backup procedures.

This is very different than the policies in other parts of the world. Under US rules, the airlines have more autonomy and liability in deciding when it was safe to fly. They have procedures for assessing danger. KLM and Air France ran tests that showed that the risk was less than the computer models indicated. Pressure mounted as airlines threatened to sue the governments that were closing the skies. After five days, the flight ban was lifted.

Airlines and affected businesses are still considering suing. The reason – **the models were wrong! The skies were not dangerous.**

Britain’s Civil Aviation Authority spent six days sponsoring a number of scientific and engineering studies that finally deter-

mined a safety threshold – “a concentration of ash of 0.002g per cubic metre of air.” (This is equivalent to .000004 pounds per cubic yard.) Research data indicates that the peak concentration of dust was probably only .0004 grams per cubic meter.

When viewed with the clarity of hindsight, the ban was completely unnecessary. However, prior to this eruption there had been almost no research done into the dangers of volcanic ash. Specifically – there had never been any research into what levels of volcanic ash pose a risk to airplanes. Officials may have been over cautious, but they literally had no idea what was safe. **They were using a twenty five-year-old policy, inaccurate models, no empirical evidence, and a dearth of science for decision making.**

To some extent, the whole issue has become politicized. Critics of current man-made global warming theories are drawing parallels between the faulty ash models and the climate model problems revealed by Climategate. They ask if more billion dollar policies will be made based on flawed models. Meanwhile supporters of a stronger EU point to the confusion as different nations determined policies over their own air space. They claim that the entire experience is an argument for more unified control over all EU airspace.

In other words, even as travel resumes, the impact of Eyjafjallajökull will continue to linger in the pocketbooks and policies of Europe.

If This Goes on . . .

So what is the outlook for Eyjafjallajökull? It remains active but the plume of the eruption is currently 3 km (1.9 miles) high and declining. Will this lovely trend last?

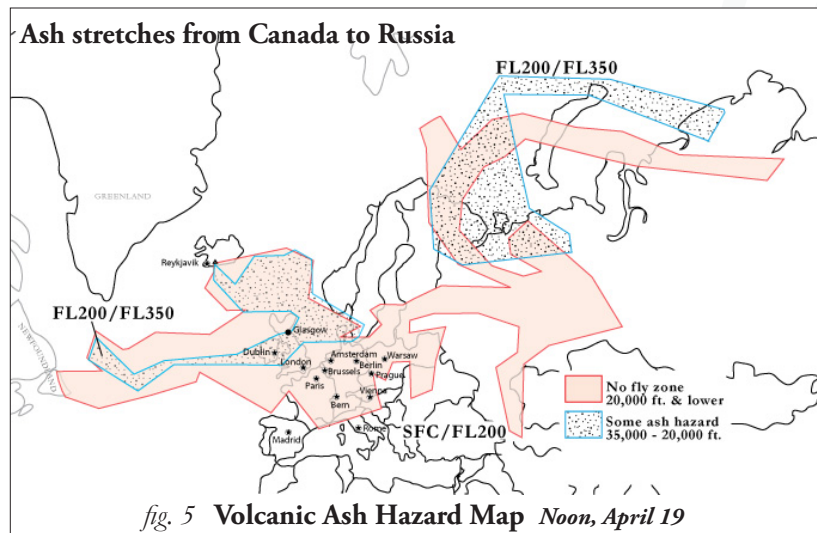
In the words of Arizona’s award winning International Volcano Research Center (IVRC):

“Volcano prediction can be tough going, but volcanologists really have their hands full with the ongoing eruption at Iceland’s Eyjafjallajökull. When will it end? Will there be even more ash? And will Eyjafjallajökull’s bigger and badder neighbor Katla join in? It seems that the very character of Icelandic volcanoes is working against reliable forecasting. If anything, the long-term outlook is bad. Eyjafjallajökull’s orneriness became obvious on the 17th of April, when scientists at the University of Iceland and the Icelandic Meteorological Office announced that the volcano’s chemistry had changed.”

Scientists had been completely surprised when the quiet lava flows of March were suddenly replaced with a plane-grounding ash plume. The latest chemical analyses of ash explain why. Initially the volcano’s lava had been thin and runny. Overnight on the 14th, the contents of the lava switched and there was a huge boost in the silica content of the magma. Silica-rich magma makes for more viscous lava and thus a more explosive volcano. The mountain, which was regularly monitored, gave no chemical warning that the switch was on the way.

Again, in the words of the IVRC:

“Eyjafjallajökull is not divulging its longer-term intentions either. According to geophysicist Páll Einarsson of the University of Iceland, the magma feeding the current eruption seems to be coming from down deep rather than a shallow chamber. So it is impossible to gauge just how much magma could emerge during this episode of activity. The best clues may come from the historical record. That isn’t encouraging, according to volcanologist Lee Siebert,



source: metoffice.gov.uk/aviation/vaac/data/VAG_1271612174.png

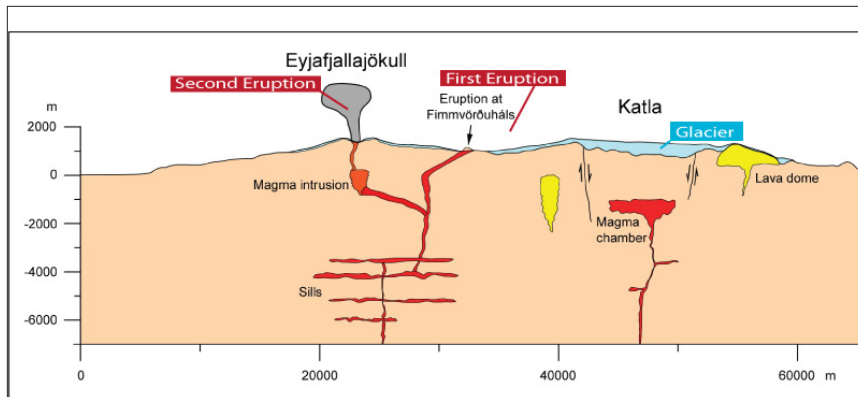


fig. 6 Eyjafjallajökull and Nearby Katla

Páll Einarsson, Institute of Earth Sciences, Nordic Volcanological Center http://www.earthice.hi.is/page/ies_Eyjafjallajokull_eruption?74,23

director of the Global Volcanism Program at the Smithsonian Institution in Washington, D.C. “

It certainly isn't. Eyjafjallajökull has a history of prolonged eruptions. Its last eruption went from 1821 to 1823. The time before that, in 1612, the eruption continued, on and off, for over a year. Even the minimum estimate by scientists is that it will continue exploding for a month and most estimate six more months or more. This means that issues of ash clouds and airplanes can arise again.

Even more ominously, Mt. Katla, a giant volcano that historically has had eruptions that have changed the climate, lies nearby. Each time Eyjafjallajökull has erupted in the past 2,000 years – in 920, in 1612 and between 1821 and 1823 – Katla has exploded within six months. The last eruption of Katla, in 1918, killed crops across war-torn Europe, causing massive food shortages. The precipitation triggered by the ash turned the trenches of World War I into quagmires. The volcano also has a history of melting the nearby glacier, causing serious floods. At the peak of its 1755 eruption, the flood discharge has been estimated to have been the equivalent of the combined discharge of the Amazon, Mississippi, Nile and Yangtze rivers.

Historically, Katla goes off every 90 years, so it is about time for it to erupt again. Iceland's President, Olafur Grímsson, has been quoted by the BBC saying that his nation has been “waiting for that eruption” for some years, and has made preparations for rescue and emergency ser-

vices.” He also added “So I think it is high time for European governments and airline authorities across the globe to start planning for the eventual Katla eruption.”

Currently, Katla shows no immediate signs of erupting, although some scientists say that it has shown more signs of restlessness since the late 1990s.

At the moment, the airline industry is cautiously optimistic that the worst is over. They, like the rest of Europe, are beginning to relax and enjoy the incredible sunsets. The volcanic aerosols (particles) from the eruptions, floating high in the atmosphere, are not dense enough to damage airplanes, but they are blocking out incoming solar radiation. Blue and green visible light is being scattered, making the sunsets appear more red and yellow. Other solar radia-

tion is also being filtered, as well as being reflected back into space by the volcano's sulfur emissions.

Fortunately the eruption is only medium-sized and growing smaller. Its climatic impact was focused on Europe and had only a short-lived impact. The ash cooled off one or two fronts, but this was not enough to counter the prevailing warmth from the Atlantic. The dust clouds did absorb a great deal of marine moisture and ultimately fell out in concentrated rainfalls in Southern Europe from Spain to Eastern Europe. If the eruption continues for months, it can cool repeated fronts, giving Europe, particularly Northern and Central Europe, a cooler spring and early summer. This could give a slow start to Europe's rapeseed (canola oil) crop as well as raise concern for northern grains. At the present level, however, it will only create pretty sunsets.

Eyjafjallajökull was a relatively small eruption, geologically speaking. If it caused big problems, it was because Europe was massively unprepared. When Iceland has another eruption (notice – when, not if), it will be interesting to see if Europe has learned its lesson. Societies that are close to and downwind from a volcanic hotspot need to be prepared or their profits will be buried in a cloud of ash.

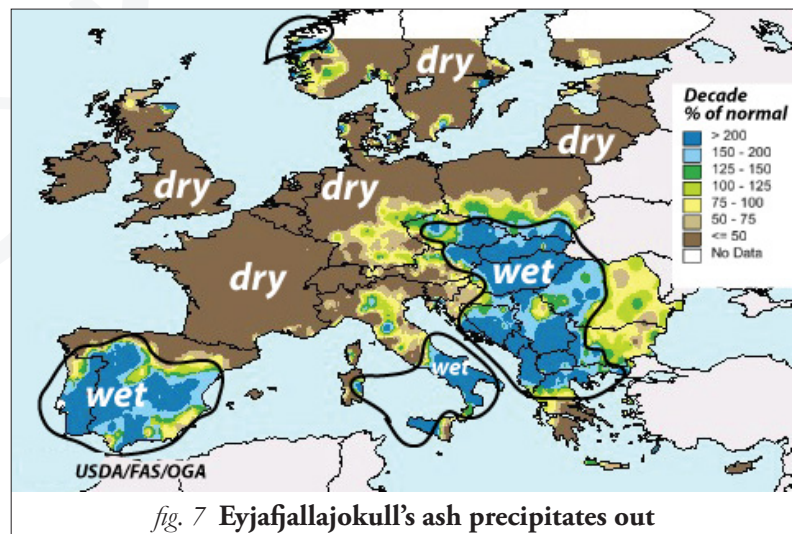


fig. 7 Eyjafjallajökull's ash precipitates out

<http://www.pecad.fas.usda.gov/cropexplorer/imageview.cfm?regionid=europe>

And Now for North America

SUMMARY: With the declining volcanic activity in the North Pacific and the fading El Niño in the Tropical Pacific, we are facing a hot, dry summer.

Ironically, while news events focused on a volcano's impact on Europe, two active volcanoes were affecting North America. There was absolutely no coverage.

About the same time that Eyjafjallajökull first erupted in Iceland, Russia's Mt. Kliuchevskoi and nearby Sheveluch also began to rumble. Since then, they have been almost constantly erupting, but none of these explosions has been very large. The eruptions that actually have been high enough to affect weather have been only 4.8 - 7 km (3 - 4.3 miles) high. This means they have been too low to sweep into eastern portions of North America and instead have precipitated out on the West Coast, from British Columbia to California. This cooling moisture has not been enough to eliminate all drought conditions, particularly in California's agricultural Central Valley, Idaho, Montana or Canada's wheat growing provinces of Saskatchewan or eastern Alberta.

Any precipitation in the drought-stricken is welcome. However, this impact is relatively minor compared to the chilling nationwide effect the volcanic dust in the Arctic had this winter. Back in winter, the volcanoes were the dominant factor affecting North America's climate. Now volcanic activity and impact is fading.

North Pacific volcanic activity, the El Niño and the warm Atlantic were the "Big Three" shaping the climate in the Northern Hemisphere. With the volcanic threat fading, the remaining factors determining the spring weather have been in the Atlantic and Pacific.

The Fading El Niño

As the volcanic activity receded this spring, North America was increasingly dominated by the westerly winds from the Pacific. That means the El Niño has been the main factor shaping spring.

We have seen the influence with the cooler wet weather along the southern tier of states and warmer, drier weather in the North. Both the warm temperatures in Canada and the drought in its Prairie Provinces are typical of El Niño. The worst of the dry weather has been mitigated by the volcanic debris seeding West Coast clouds.

El Niños are short-lived phenomenon, usually lasting only six to nine months. The current El Niño started last June and by last March it was nine months old. Not surprisingly, it began to fade just before the month began.

Once the water temperatures began to drop in the Tropical Pacific, they plunged. By now, the average temperature in the El Niño region is only 0.2°C (0.4°F) above

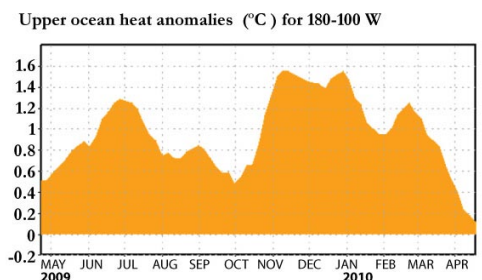
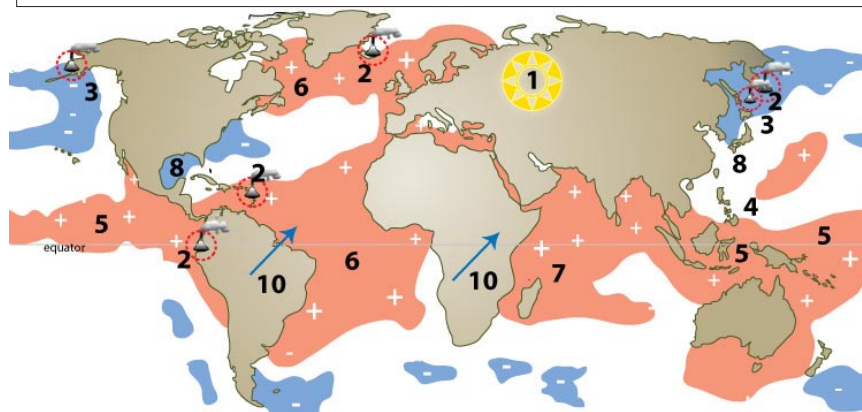


fig. 9 The rapid fade of an El Niño

http://www.cpc.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

normal. To be an El Niño, the area has to be 0.5°C (0.9°F) above normal. Basically, the warm event is over. Officially it is not officially over, there are still a few regions that fit the phenomenon's technical definition. (Indeed, some centers are saying that the phenomenon has shrunk to an El Niño Modoki - a smaller phenomenon that has little to no affect on North American weather.) It probably will not be declared officially over until sometime in May.

Natural Factors Shaping Spring and Summer's Weather



- 1 The sun is beginning a new solar cycle but it is still very quiet.
- 2 Large volcanic eruptions have put climate changing debris in the stratosphere.
- 3 Several volcanoes continue to have small and medium-sized eruptions.
- 4 Warm water off the West Coast.
- 5 The El Niño is starting to fade while Southeast Asia remain unusually warm.
- 6 Most of the Atlantic is unusually warm.
- 7 Most of the Indian Ocean is warmer than average.
- 8 Waters in the Gulf of Mexico and off the Southeast US are unusually cool.
- 9 Waters off of East Asia are unusually cool.
- 10 The high altitude Quasi Biannual Oscillation (QBO) winds are westerly.

fig. 8

A La Niña will probably begin in August. This is not good news. El Niños tend to be benign, especially for US agriculture. La Niñas are not.

The drop in temperatures is startling, but then this particular phenomenon has been strange to begin with. It developed only 3 months after 2008's cool La Niña ended. Most events take a year or more to grow. This El Niño started at the beginning of summer; most start in autumn. It developed rapidly and it is dying just as quickly.

So what's next?

That is the great unknown. There are over twenty models each with its own projection. Over the years, the most accurate have tended to be the USA's NCEP's (National Centers for Environmental Prediction) coupled forecast model and Japan's FRCGC's (Frontier Research Center for Global Change) model. Unfortunately, this time they disagree.

Compare the forecasts of two very good climate research agencies.

NCEP – “The CFS ensemble mean (heavy blue line) predicts the return to ENSO-neutral by Northern Hemisphere summer 2010, and the onset of La Niña during fall 2010.

Expected El Niño impacts during April-

June 2010 include drier-than-average conditions over Indonesia and enhanced convection over the central and eastern equatorial Pacific Ocean. For the contiguous United States, potential El Niño impacts include above-average precipitation for the southeastern states, while above-average temperatures are most likely for the Pacific Northwest.”

FRCGC – “Current Modoki-type El Niño would end soon in the following months. A fairly strong La Niña condition would develop in boreal summer.

Warmer-than-normal climate associated with current El Niño would decay after boreal summer over many parts of the globe, particularly in Northern Hemisphere continents and Australia, due to the influence of La Niña development. In boreal summer and fall, more precipitation would appear in eastern Asia with a strong Meiyu-Baiyu season. Indonesia, Australia, Northeast Brazil, and India would also experience more rains or floods. Current severe drought disaster in southeastern China might be slightly reduced in following months.”

Remember – there are 20+ different opinions on what will happen. After a lot of discussion, the opinion of the Browning Newsletter is that the El Niño will be declared officially over by the end of May. The Central Tropical Pacific will continue to cool. What next? A La Niña will probably begin in August..

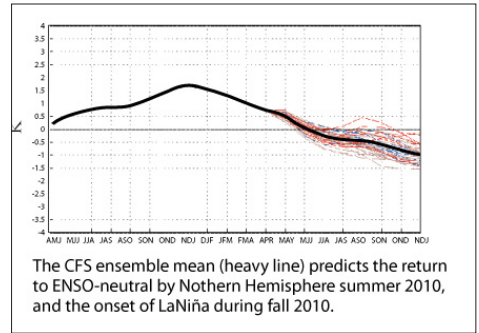


fig. 10 Towards an Autumn La Niña

http://www.cpc.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

This is not good news. El Niños tend to be benign, especially for US agriculture. La Niñas are not. If one occurred in late summer, it would bring heat waves and drought to important agricultural areas.

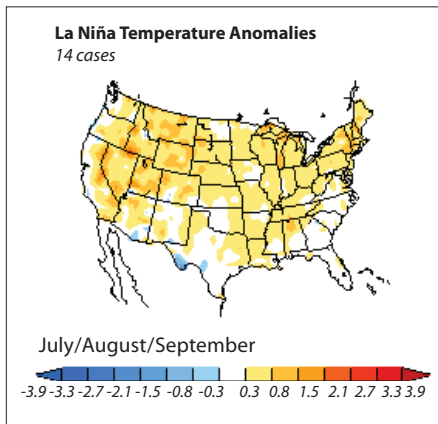
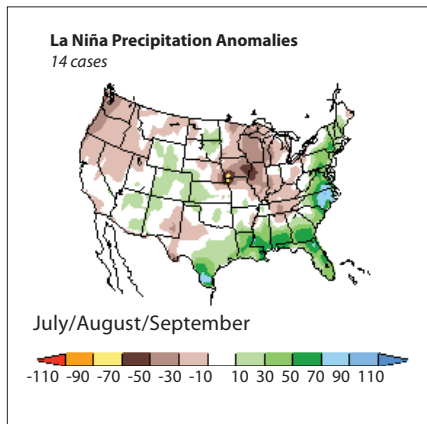
The Dominant Atlantic

Three factors shaped the winter - North Pacific volcanoes, the El Niño and the warm Atlantic. By late May, lasting through July, only one of these factors should be significant – the continuing warmth of the Atlantic Ocean.

We are already seeing the impact of the unusual warmth of the Atlantic. Unusually warm temperatures dominated Eastern Canada and large sections of the Midwest and Northeast through most of March and April. In the US Midwest, April temperatures averaged between 6 - 10°F (3.3 – 5.6°C) above normal. This allowed a bountiful planting season for corn.

Barring a huge volcano eruption, either in the North Pacific or Katla on Iceland, this warmth will continue to be a major factor shaping the weather. If added to the normal heat that a late summer La Niña creates, we could be seeing late summer conditions as uncomfortable as 2003 or 2005.

It remains difficult to find years similar to this, especially if the North Pacific continues to have only small eruptions that enhance Pacific storms. However, based on the five closest years (some of which are in the 1930s and 1950s) the following is the most probable weather pattern.



http://www.cpc.noaa.gov/products/precip/CWlink/ENSO/composites/EC_LNP_index.shtml

figs. 11-12

LATE SPRING – The rapid disappearance of the El Niño warmth has altered the outlook for May. The moisture and cooler weather that a retreating El Niño would have brought will not be present in a springtime with no El Niño and a warm Atlantic. While it still appears that weather will be warm and dry in the West and warm in Canada, expect warmer than average weather in the Midwest and Mid-Atlantic states as well. Indeed, expect temperatures in the Corn Belt to be hot. Wet conditions should continue in the Northern and Southern Plains and there is strong potential for good moisture in the Western Prairies, but not Saskatchewan. In 40% of similar years there was heavy rain in the Midwest and Ohio Valley that led to flooding.

EARLY SUMMER – In 80% of similar years, the main theme of the weather for Canada and the US was warm and dry. Only Texas and Oklahoma have consistently had good rains and moderate temperatures. Expect warmth to dominate Canada and the northern tier of states. California and the West should be warm and the West Coast and Arizona should be dry. Similarly, in 60% of comparable years, much of the Midwest, Great Lakes and Central Plains were dry. In most years, the South-central states had dry conditions as well.

LATE SUMMER – Every similar year had a heat wave, but if there is a La Niña, the conditions will be worse and accompanied by drought in portions of the Midwest,

from Saskatchewan to Iowa and Illinois. In 60% of similar years the South was very hot and muggy with above average moisture from Texas to the Carolinas. Expect a busy beginning to the hurricane season. In 40% of similar years a tropical storm brushed the Carolinas and in 60% of similar years Texas had a landfall of a tropical storm or low category hurricane.

El Niños bring benign weather to the US. Unfortunately, the event is almost over. Expect a hot, uncomfortable summer.

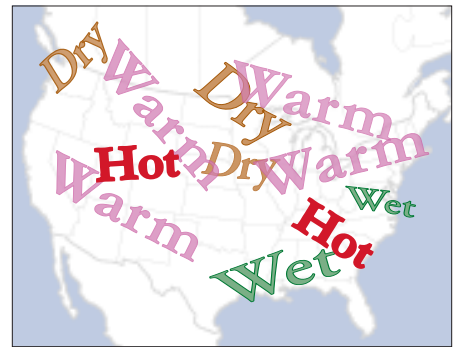
Cool 2°C or more lower than normal temp.	Hot 5°C or more higher than normal temps	Wet 125% or more of normal moisture
Warm 2-4°C or more higher than normal temps.		Dry 75% or less of normal moisture



Late Spring



Early Summer




Late Summer


figs. 13-15

© Browning maps

*If the North Pacific volcanoes continue to be active, these regions will be cooler and wetter.


News Notes


 Apparently airplanes were not the only fliers inconvenienced by the eruption of Eyjafjallajökull. Much to the delight of British birdwatchers, northern birds are seeking shelter from the ash cloud in Scotland and the Western Isles. The acid and particles are bad enough on an airplane: they are hell on the raw skin and eyeballs of a living animal. Most of the arrivals are common, like geese, but they are arriving in much greater numbers than normal. One of the most unusual arrivals has been a gyrfalcon, the world's largest species of falcon. These birds are normally found only along Arctic coasts and this particular bird appears to have come from Greenland. (These birds are so rare in southern climates that only kings were allowed to hunt with them in the Middle Ages.)


 As April ends with a flurry of heavy storms and tornado warnings, it is hard to believe that at the beginning of the month, the news was about how few tornadoes there have been. The 2010 Tornado Season had a very slow start when compared to the average. At the beginning of April, the count was less than 1/2 of the 10 year average, and less than 1/3 of the average since 2005. The turning point of activity finally came with the tornado outbreak from April 22 – 25.


This single outbreak caused 150 reported tornadoes and covered 8 states. The storms began in the Eastern and Central Plains, stormed through Texas and ended in Mississippi and

Alabama. The worst storm was a Mississippi tornado that was 1.75 miles (2.8 km) wide and tracked for 149 miles (240 km). It killed 10 people, three of them children.

 As horrible as the Midwest outbreak was, it is put into perspective by a single giant tornado that left over a million people homeless in India. The 40 minute storm ravaged West Bengal, killing 137 people and destroying more than 200,000 homes. In the US, we have a weather warning system, but the Bengalis were hit without any warning by 75 mph winds. A week later, there are still no health centers in the area. Local water sources have been contaminated by dead livestock, causing widespread infections. Charities that are trying to help are reporting a major upturn of traffickers who are in the region buying children that will become slaves and prostitutes. The region has been plagued by child trafficking in the past and hundreds of families are selling their children, rather than watch them starve.

 On Friday, April 24, weathermen gave the most eagerly awaited forecast in the world – the outlook for Asia's monsoon. This year's rainfall is critically important following last year's severe drought. More than 70% of Indians depend on farm incomes, and about 65% of the nation's farms are not irrigated. The rains of 2009 were 30% weaker than normal, leaving millions impoverished and food prices much higher than normal. Fortunately this year the Indian Meteorological Department forecast normal rains within the range of 96%-104% of their long-term average. "Monsoon rainfall rarely fails for two consecutive years." Historically, out of the roughly 20 droughts India has suffered since 1901, 17 were followed by near-normal rainfall. The possible La Niña in late summer makes the outlook even stronger.

 It is springtime in the Arctic and there is good news for people concerned about polar bears and the melting polar icecap. On Earth Day, the Arctic ice was at its greatest amount on this day in eight years. As temperatures rose to a balmy -15°C (5°F) north of latitude 80°N, the region was drenched with sunshine 24 hours a day. The ice has begun to melt, losing about one million km² (386,102 square miles) – around the edges. At the same time, however, wind patterns are continuing to make the sea ice thicker closer to the poles. By the end of April, the total amount was actually above the 1976 – 2006 average. Given the fact that the Arctic Oscillation winds are still negative, this year should be a good year for the growing sea ice.

 Rescue by . . . ladybug? It's pleasant to run into a success story. The isolated Galapagos Islands with their exotic species have been fascinating ever since the days of Darwin. Unfortunately the success was turning lethal. Invading species have been arriving on the island and killing the vulnerable native species. Indeed, alien or exotic insects today constitute 23% of the Galapagos insect population. One of the worst of these insect invaders is the cottony cushion scale, a sap sucking bug native to Australia. The infestation was becoming an epidemic and the native wildlife had no natural defenses.

A similar problem had happened to the California citrus crop back in the late 1800s and back then, farmers learned that ladybugs love to munch of the scale insects. Scientists gingerly introduced the ladybugs to one island and discovered that the spotted little critters destroyed 99% of the pests. Even better, they did not eat the native species. They have now introduced the bug to all of the islands. So – when you are out enjoying springtime and May flowers and you see a ladybug – remember – in some parts of the world it's a hero.

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