

# BROWNING

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NEWSLETTER

A Fraser Management Publication

Vol. 35, No. 4

.....  
 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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## In this issue

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**El Niño** – Two of the major factors that have created a volatile winter have gained more energy. How these will affect this spring and summer?

### 6 Looking Ahead to the Hurricane Season

– Don't get too comfortable over last year's quiet season. A number of factors are shaping a very different season this year.

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## Springtime Renewal – Volcanoes and El Niño

*SUMMARY: Volcanic activity in the Northern Hemisphere remains amazingly active. At the same time, the El Niño was strengthened in February. The cooling impact of one and warming from the other will create more active, random and downright variable spring-time weather.*

Winter is over. Thank Goodness! Spring is beginning. Oh, dear!

The winter of 2009 – 2010 was shaped by three major factors:

#### 1. Heavy volcanic activity – Over the last

3 years we have seen unusually heavy volcanic activity in the Arctic. In 2009, Mt Redoubt in Alaska and Sarychev Peak on Russia's Kuril Island were so large that they penetrated into the stratosphere. In mid-January Russia's Mt. Klyuchevskoy exploded, sending debris from 4.5-8 km (2.8 – 5 miles) high.

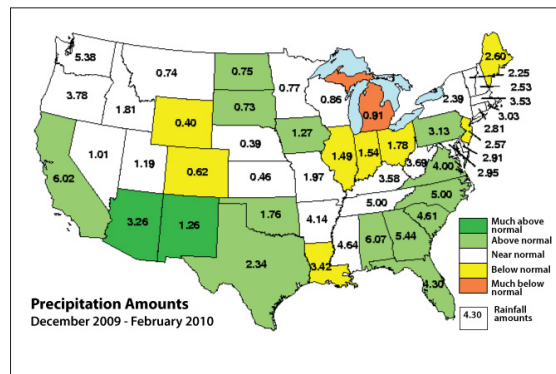
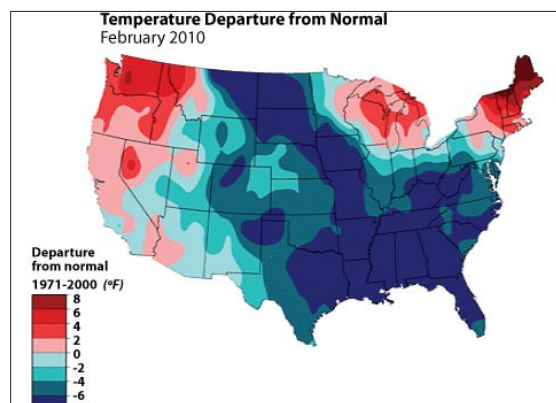
The ash and chemicals in the air blocked out incoming sunlight, cooling the Arctic air mass. This, in turn, changed air pressure patterns, altered the direction of the prevailing winds. Polar winds turned south, penetrating deep into eastern North America, Europe and East Asia.

**2. El Niño** – The waters of the Tropical Pacific have been an average of 1.8°C (3.2°F) warmer than normal. This has heated the air above it, altering weather patterns. The changed ocean and air patterns have brought warmer weather to the West and most of Canada.

**3. The warm phase of the Atlantic Multi-decadal Oscillation** – The Gulf Stream and other Atlantic currents are flowing faster, bringing warmer water to the northern latitudes. This has created a pool of warm air and water that has energized winter storms.

The combination of these factors created an unusually cold winter throughout most of the

*figs. 1-2 US Temperature and Precipitation Winter 2010 December-February*



nations in the Northern Hemisphere. A persistent high-pressure system in Eastern Canada steered Arctic air southeast into the US, across the Plains, Midwest and Southeast. Nor'easters blasted up through the East Coast. The weather broke 18,201 temperature and precipitation records. It was the 10th coldest winter on record for most of the Southeast and the 10th wettest along the Mid-Atlantic and Southeastern coastlines. Huge storms swept through the eastern two-thirds of the continent, stranding Christmas travelers in December. January saw snow in every state but Hawaii and killing frosts in Florida. February pounded the East with a "snowacane".

As winter continued, the global volcanic activity and the moderate El Niño in the Pacific showed signs of ebbing. Now both are strengthening. Renewing the forces that shaped this stormy winter will create a very extreme and stormy spring.

## A Tropical Volcano Too

2009 saw a great deal of arctic volcanic activity in the Northern Pacific. Alaska's Mt. Redoubt exploded into the stratosphere in springtime and Russia's Sarychev Peak had an even bigger eruption in early summer. Both set up a shield of ash and chemicals to block incoming sunlight during Arctic season for warming. Meanwhile Mt. Sheveluch on Russia's Kamchatka Peninsula has been having a series of low eruptions not big enough to enter the stratosphere and orbit the Earth. The debris entered and cooled the passing cold fronts. When the ash and debris finally precipitated out, usually in North America, it broke thousands of precipitation records.

The Northern Pacific grew quieter in 2010. Alaska was completely quiet. A number of Russian volcanoes bubbled and seethed, but only Mt. Klyuchevskoy had an eruption large enough to affect the weather. It erupted in mid January and its debris cooled the next cold front enough that freezing temperatures plunged as far south as Miami, Florida.

Then, on February 11, Soufrière Hills on Montserrat Island in the Caribbean exploded 15 km (9.3 miles) high. This eruption was followed up on March 25



© Mary Jo Penkala

fig. 3 Soufriere Hills on Montserrat erupts

February 11, 2010

by another huge explosion (12 km. or 7.5 miles) that blasted the stratosphere and provided in-flight entertainment for a bunch of Caribbean tourists. Nobody was harmed by these eruptions, since the island inhabitants have evacuated nearby areas since the volcano first woke up in 1995. Following the latest eruption, a few nearby islands had to delay flights because of the wide spread dust. Meanwhile, Mary Jo Penkala, a hairdresser from Calgary, Canada won her 15 minutes of fame by being quick-witted enough to take a spectacular picture when the pilot dryly announced "Ladies and gentlemen, on your left you will see an erupting volcano."

[NOTE: This incident was so much calmer than the notorious 1982 British Airways flight that was blasted by ash from an Indonesian eruption. The pilot rivaled Captain Sully for skill as he saved the airplane after it fell 23,000 feet. But his announcement -- "Ladies and Gentlemen, this is your Captain speaking. We have a small problem. All four engines have stopped. We are doing our damndest to get them under control. I trust you are not in too much distress." -- was classic]

For two years, we had seen volcanic activity concentrated near the poles.

(The Southern Hemisphere had the huge and prolonged eruption of Mt. Chaitén in 2008, which helped destroy so much of the Brazil and Argentine soybean crop.) Now there was a giant eruption in the tropics. This changed global weather.

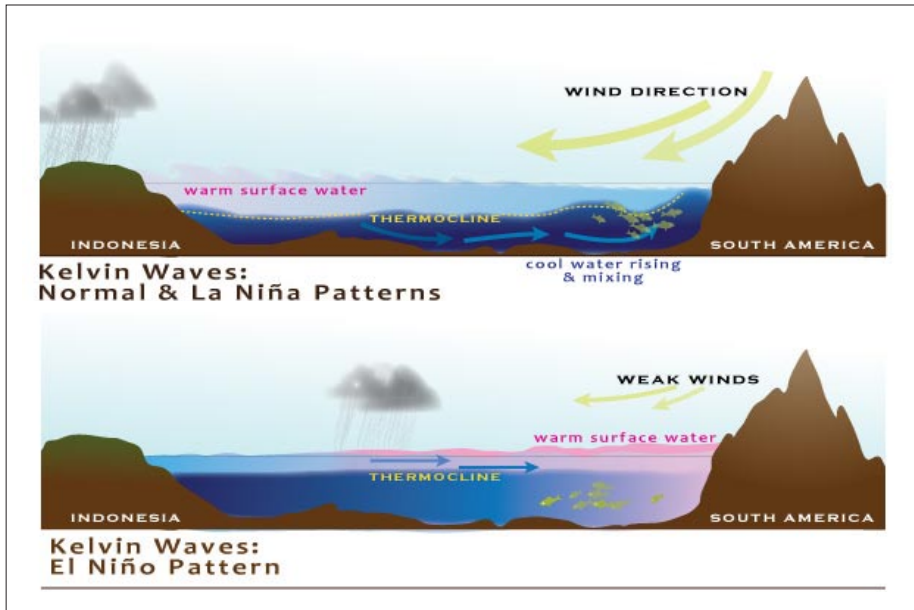
Back in the 1980s research by Dr. Paul Handler, a physicist at the University of Illinois, Urbana, suggested that the atmospheric impact of volcanoes interacts with the El Niño. According to his studies, tropical volcanoes have effects that enhance the weather impact of El Niños and polar (high latitude) eruptions have effects that counter El Niño weather. His work was controversial, but further research in 2003 by Dr. Michael Mann of the University of Virginia has confirmed that tropical eruptions have boosted the strength of El Niño weather events for the past 300 years.

From mid-January through February there were no large or medium-sized polar eruptions or major tropical explosions. According to Handle's research, the El Niño should have grown more intense. What really happened?

## El Niño – Refreshed And Renewed

We are in the middle of a very weird El Niño. Typically, an El Niño is an ocean/atmosphere pattern where the center and eastern tropical Pacific warm up. This warms the air above the thousands of square miles of hotter water. The semi-permanent region of warm air is like a rock in a stream, atmospheric currents flow around it. This alters weather patterns throughout the globe. The combination of warmer water and changing weather is called the El Niño/Southern Oscillation or ENSO. The El Niño then fades and the Tropical Pacific grows cooler and creating a La Niña, which also alters climate. Historically this oscillation from El Niño to La Niña and back again takes between 4 and 7 years.

Last year, the oscillation was more like a rapid jerk. The cool La Niña conditions of early 2009 suddenly boiled. Within 3 months, the Pacific had quickly switched



figs. 4-5

[http://science.nasa.gov/headlines/y2002/05mar\\_kelvinwave.htm](http://science.nasa.gov/headlines/y2002/05mar_kelvinwave.htm)

from La Niña to El Niño. By June, a full-fledged El Niño was warming the Pacific and altering weather patterns around the world. It was not only unusual to have the phenomenon develop that quickly, it was rare to have it begin so early in the year.

The El Niño gradually grew and peaked in early December. Then it began to fade. By the end of January ocean surface temperatures had dropped, according to some measurements, over 0.5°C (0.9°F), from a strong to a weak event.

Then in February, temperatures soared again. El Niño grew from weak to moderate just in time to heat the waters off of Vancouver, where the Winter Olympics were being held. For the past four weeks, the warmth has lingered.

No one knows exactly what causes El Niño to grow in the first place. A number of factors, from solar activity to underwater volcanism correlate with the phenomenon's growth. One of the most accepted theories is that it is created by the strength or weaknesses of the tropical Trade Winds. Typically the

winds blow fairly strongly from east to west. Warm surface waters are blown westward, so that typically the temperatures of the waters in the Western Tropical Pacific are much warmer than the waters off of South America. Indeed the waters in this Indo-Pacific Warm Pool are higher than the waters further east.

When the Trade Winds weaken, this high pool of warm water begins to gently slosh back east. In an El Niño, the winds are so weak that most of the pool slides east, leaving Southeast Asia unusually cool and the West Coasts of the Americas quite warm.

We actually saw this happen with satellites. The photos showed sea surface anomalies, places where the water surface is higher (red) or lower (blue) than average. A higher-than-average sea surface height at a given location indicates that there is a deeper-than-normal layer of warm water. In January, sea surface heights across the central and eastern equatorial Pacific were elevated (red), but not extremely so, a sign that the El Niño was weakening. But in early February, a strong sea level anomaly, a wave of warm water, appeared northeast of Australia. By late February, it had spread eastward into the central Pacific and reinvigorated the current El Niño. This has caused classic El Niño weather throughout the month of March.

Even as the ocean portion of the ENSO was recharged, so was the atmospheric portion. The water temperatures of the El Niño were much warmer in December, yet its impact on climate in the Northern Hemisphere was countered by the impact of volcanic ash in the Arctic air mass. Ocean temperatures in February and early March were several tenths of a degree lower, but with quiet volcanoes in the North Pacific and an active volcano in the tropics, the ENSO impact was as large as a strong El Niño. Notice there is warmth across Canada and the northern tier of states as it does in strong El Niños.

With a stronger El Niño, it will take longer for the tropical warmth to decline. This is important. El Niño summers tend to be good years for US crops. There is

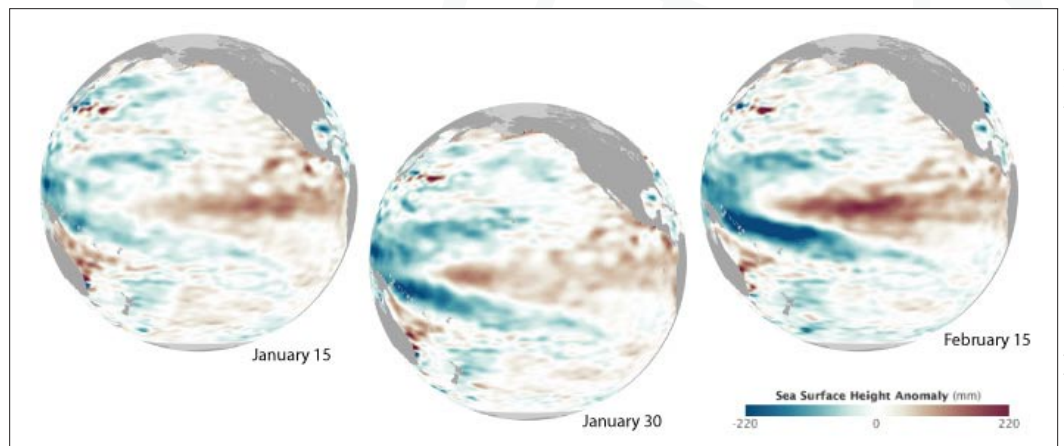
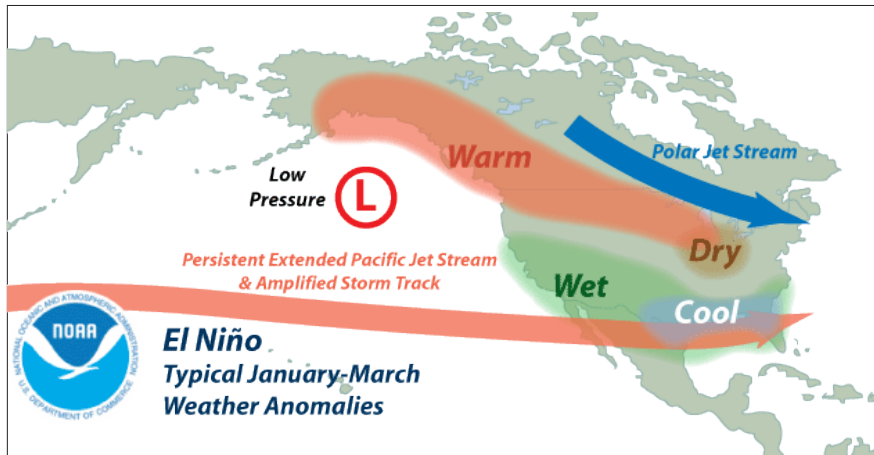
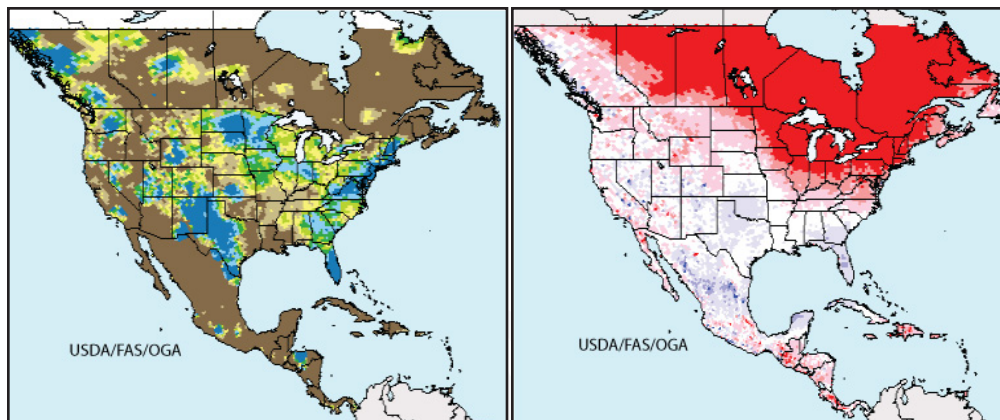


fig.6 - Kelvin wave renews and strengthens El Niño

<http://earthobservatory.nasa.gov/IOTD/view.php?id=43105>



figs 7-9 Typical Moderate El Niño Winter Weather...



...and what we actually saw.

### Precipitation anomalies (left) and Temperature anomalies March 11-20, 2010

<http://www.pecad.fas.usda.gov/cropexplorer/continentView.cfm?ftypeid=2&fattributeid=1&stypeid=2&sattributeid=3&startdate=2010-03-11%20>

usually abundant moisture and moderate temperatures. Years with retreating El Niños usually have heat and droughts (think 2005). If this event is prolonged, it will be good for crops. So far, it looks as if it will last till June. This means that a heat wave would be a late summer event and crops that were planted early or exactly on time might not be as vulnerable.

## A New Round of Arctic Volcanoes?

Just in case the situation wasn't complicated enough, in mid-March, the Arctic volcanoes woke up again.

Ironically, the volcano that made all the news was far too small to affect the weather. On March 20 Eyjafjallajökull volcano in

Iceland began to erupt for the first time in 200 years. The eruption was beautiful – a series of brilliant cascades of lava on an icy glacier. Iceland truly lived up to its Viking name, “The Land of Fire and Ice”. However, this type of activity is similar to the volcanoes of Hawaii, lava leaking out of a crack in the ground rather than shooting out a volcano crater.

There has been some concern, however. The fissure is near Mt. Katla, a giant volcano that historically has had eruptions that have changed the climate. Historical records show that every time Eyjafjallajökull erupts, Katla has also erupted. Large Icelandic eruptions focus their worst effects on Europe. The last eruption of Katla, in 1918, killed crops across war-torn Europe, causing massive food shortages. Large eruptions of Hekla are linked to crop fail-

ure (and potato blight) in the British Isles and Germany. The 1783 eruption of Laki killed thousands across Europe and helped create food shortages that ultimately led to the French Revolution.

Scientists are monitoring Katla carefully. It 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 average discharge of the Amazon, Mississippi, Nile and Yangtze rivers. This year over 600 people were evacuated when the eruption began but authorities have allowed all but 16 to return home.

At about the same time, the Russian volcanoes also awoke again. Mt. Klyuchevskoy on the Kamchatka Peninsula, had 5 km (3.1 miles) high eruptions on March 12 and again on March 15, 16 and 21. Nearby Sheveluch also erupted from March 12 – 16 (5.5 km or 3.4 miles) and followed up with an even larger eruption (7 km or 4.3 miles) on March 24.

These blasts shot their debris in the atmosphere and when the cold front drifted over North America, most of the ash and chemicals rained and snowed out in the end of the month Nor'easter that soaked the East Coast. When the cooling and ash from the north met the warming and ash from Soufreire Hills in the South, it created drenching rains and serious flooding (*see News Notes*).

In short, don't rule the North Pacific volcanoes and the Arctic air mass out of



fig. 10 A fissure eruption in Iceland

[http://www.geostudy.zoomshare.com/my\\_images/laki-fissureeruption.jpg](http://www.geostudy.zoomshare.com/my_images/laki-fissureeruption.jpg)

the picture yet. Whether their impact will be more cold in the Midwest and North-east, more East Coast precipitation, or suppressing the impact of the current El Niño, we don't know yet. They will continue to shape the spring of 2010.

## Looking Ahead

When all of the above is summarized, the following forces are shaping this spring and early summer:

- 1. Heavy volcanic activity** – Volcanic activity in Russia's Kamchatka Peninsula is continuing to be active, with two volcanoes on high (orange) and two others on medium (yellow) alert. South of us, Soufriere Hills is also on high (level 3) alert status. Large and medium sized eruptions from the north bring cool air and increased precipitation and flooding in the Northern Plains and East Coast. Large and medium sized eruptions from the Caribbean bring increased precipitation in the South and East Coast. . The East Coast may continue to be very wet for a while.
- 2. A fading El Niño** – The recent renewal of El Niño merely prolongs the phenomenon's fade. Instead of being gone in early spring, it will linger into early summer. This means it will last long enough to bring a very dry spring for the Northwest, and portions of the Midwest and South Central States.
- 3. The warm Atlantic** – As spring progresses, warm wet air will waft north into the North American interior. When cool dust-filled air masses hit the warm air, it will cause severe

**Years with retreating El Niños usually have heat and droughts (think 2005).**

storms. Additionally, the East Coast, where the cool air hits the Atlantic's marine air, will experience (and currently is experiencing) severe storms.

The result is an extraordinarily complex spring. Several of these impacts are similar and will enhance each other while other impacts will cancel each other out. Overall they form a pattern that is not exactly similar to any recent spring. In the 5 most similar years, warm extremes clashed with cool extremes.

**MID-SPRING** – If the future resembles the past, we are already starting to see the pattern that will dominate April. Warm air masses will surge in from the south and west and where they collide with cold air, there will be heavy precipitation. Meanwhile, cooler air from the north will crash into warm Atlantic air and cause serious flooding. Due to the El Niño, Canada and the northern tier of states will be warmer than usual and the southern tier cooler. While Colorado and the east side of the Rockies should continue to see snow, most of the West will be drier than normal.

**LATE SPRING** – The most common pattern in similar years was for North America to become almost schizophrenic – warm and dry in the West and wet in the

East. Even the years without much volcanic activity tended to have warm and dry conditions through most of the West, warm conditions in most of Canada and plentiful rainfall in the Midwest and East. (The one year that was different had extreme drought in the coastal Southeast.) Two of the years had a strong warm spell and sudden melting that caused heavy mid-western and Ohio Valley flooding. In most of these years, conditions were cool and wet enough that planting was delayed in much of the Corn Belt and many farmers switched from corn to soy.

**SUMMER** – Expect a difficult summer, especially for farmers. The longer that the El Niño lasts, the more benign conditions will be. If, however, the event is over by late June, we can expect some very hot weather in late summer that may damage crops and stress utilities. Every similar year had a very busy hurricane season (*see second article*). In 60% of matching years, California and most of the western continent had dry weather, which created a very active fire season.

Overall, the good news is that the cold miserable winter is finally fading. The bad news is that the conditions that have created the current extremes are still in place and will linger. Expect a memorable spring and summer.

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



Early Spring



Late Spring



Summer

figs. 11-13

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

© Browning maps

# Looking Ahead to the Hurricane Season

It's April – time for spring showers (just what New England needs) income tax and Atlantic hurricane season forecasts.

Two of the best known forecasters have already issued projections. Both Dr. William Gray at Colorado State University and Accuweather's Joe Bastardi projected unusually active hurricane seasons. The Colorado State team, which made its initial forecast in December and will update in April, predicted:

- **11-16 named storms,**
- **6-8 hurricanes and**
- **3-5 of the hurricanes to become major hurricanes with winds of 111 mph (179 kph) or greater.**

The Accuweather team saw an even more active season with:

- **16 – 18 tropical storms of which**
- **5 would be hurricanes and**
- **2 – 3 would be major.**

Compare this to normal years, which average 9.6 tropical storms, 5.9 hurricanes and 2.3 major hurricanes. Dr. Gray is seeing above normal activity in all categories. Accuweather sees more tropical storms but a normal number of hurricanes and intense hurricanes.

Dr. Gray and his colleague Dr. Philip Klotzbach see an almost two-thirds chance (64%) of at least one major hurricane making landfall on the US coastline. They also see a 40 % probability of a major hurricane hitting U.S. East Coast, and a 40% chance of one hitting the Gulf Coast. They also see a 53% chance, ten percent higher than

usual, of a major storm landing in the Caribbean.

The AccuWeather.com Hurricane Center team thinks the season may be even more dangerous. They expect 15 of the storms to be in the western Atlantic or Gulf of Mexico and therefore a threat to land. Bastardi predicted seven storms would hit land, five of them hurricanes and two or three of them “major landfalls.”

What is ironic, is that a few days after the AccuWeather forecast, the UN's World Meteorological Organization warned that the El Niño might linger into the hurricane season. They noted that El Niños disrupt Atlantic hurricane development and produce quieter seasons. They didn't forecast a quieter season, but their intrusion might leave many wondering what to believe.

## The View From The Newsletter

Basically, to have an active hurricane season, it is necessary to have:

1. **Thunderstorms drifting into the Atlantic,**
2. **Warm waters,**
3. **Favorable winds, and**
4. **Clear skies without aerosols**

In an Atlantic hurricane season, thunderstorms drift off the west coast of Africa or off the east coast of North America and enter the tropical Atlantic. The heat of the summertime and early autumn ocean wa-

ters provide enough to heat the storms and make them grow. As the storm grows, high altitude winds torque the storm, making it spin. The storm grows and spins becoming a tropical storm and ultimately a hurricane. If the water is too cool, the storm does not get enough energy. Aerosols can soak up the storm's moisture before its growth even starts. Unfavorable winds can sheer off the top of a storm, limiting its growth.

Last year saw heavy dust in the air combined with an El Niño. Typically El Niños produce sheering winds. What do we see for this year?

Thunderstorms drifting into the Atlantic – These will become frequent with the beginning of the summertime monsoon season in Africa.

**Warm waters** – As mentioned earlier the Atlantic Ocean is in the warm phase of a long-term climate pattern - the Atlantic Multidecadal Oscillation (AMO). The Gulf Stream and other Atlantic currents are flowing faster, bringing warmer water to the northern latitudes. For a tropical storm to develop the waters have to be 26°C or 80°F and some tropical waters are already that warm. The waters are already between 0.5°C (0.9°F) warmer than normal in the Caribbean and 1.5° – 2.5°C (2.7° - 3.5°F) warmer in most of the tropical Atlantic.

Most forecasters are basing part of their projection on these warm temperatures. What most are not including is an even smaller Atlantic cycle, the Tropical Atlantic Variation. This has sometimes been called “The El Niño of the Atlantic.” Instead of warmer and cooler water oscillating east and west, in the Atlantic it shifts north and south in a 2 – 5 year cycle. Last year, as the Browning Newsletter noted, the TAV had the warmth fairly far south. This year it stretches straight from Africa to the Caribbean and is shifting north. It should be noted that in the explosively active year of 2005, the warm water was a red carpet that stretched straight from Africa to the shores of Louisiana. In other words, the Atlantic is not only warmer this year but the warmth is ideally positioned for storm development.

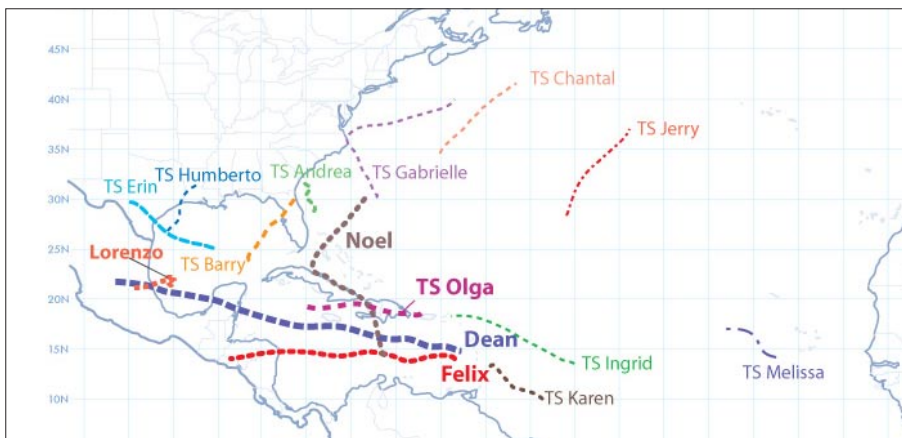


fig. 14 This year is most similar to 2007, which had 15 tropical storms.

**Favorable Winds** – Tropical storms not only need warm water, they need winds that will start a cyclonic spin. Typically the waters in this “spin zone” do not get warm enough until June. The warm phase of the AMO warms the marine air mass which, in turn, changes atmospheric pressures and wind patterns. These changes are more favorable for tropical storms than the normal wind patterns during the AMO cold phase. Again, this is information almost all scientists are using in their forecasts.

However, it is not just the wind patterns in the Atlantic that are shaping the hurricane season. The El Niño in the Pacific affects high altitude winds throughout the tropics. When there is an El Niño during the Atlantic Hurricane season, as there was all last year, it has two effects:

- It tends to create a high altitude wind that sheers off the tops of most developing tropical storms, especially those in the Caribbean and Gulf of Mexico.
- The winds, which blow from west to east, steer the tropical storms that do develop towards the east. That is good news for the East Coast and the Western Gulf Coast, but not for western Florida or the Eastern Gulf Coast. It is also good news for most Gulf oil and gas production.

This year, according to most computer models, the El Niño is cooling off and should be gone sometime in June. This means the impact of this event will only affect the earliest portion of the hurricane season, which tends to be pretty quiet anyway. It also means there will not be any general steering toward the east, as you see in El Niño years or straight towards the west like La Niña years. This will be a year of random tropical storm movements with the storms largely steered by the wandering Bermuda High.

**Clear skies without aerosols** – This year, as the AccuWeather team notes, the winds blowing from Africa show signs of being weaker which means that there will be less dust from the Sahara floating over the Atlantic. Last year the dust heavily affected storm development. However, Soufriere Hills vol-

cano is erupting in the Caribbean. The last time this happened, in 2006, its ash and debris quelled the beginning of the hurricane season. This year, the eruption was early enough that it probably will have little or no influence – but – if it continues to explode, it will subdue storm development in the Caribbean. There will be heavy rains, but the storms’ growth will be limited.

## The Bottom Line

With a warm AMO, receding El Niño and heavy volcanic activity, this hurricane season will probably be most similar to 2007’s activity. Of course, it will not be the same – this current El Niño is stronger and longer-lasting than the 2006 – 2007 event. The current Tropical Atlantic is warmer, but in 2007 the warmth was more widespread. Also, this year the volcanic debris is heavier and Caribbean Soufriere Hills may wake up again. Still, there are enough similarities that planners should look at what happened that year.

In the five most similar years to 2010 we saw the following patterns:

- The current warmth in the Atlantic and the prevailing wind patterns are ideal for hurricane development. Expect a busy tropical storm season with 15 or more named storms.
- There are enough ashes and chemicals in the air that the storm development may be hindered. Probably only 5 or 6 of the storms will grow to hurricane

status and 2 to 3 will be intense.

- At least 3 storms should start as subtropical storms drifting off of North America and being transformed by the warm Atlantic waters. These types of storms tend to have weaker winds and much heavier rains.
- Canada’s Atlantic Provinces should expect at least one hit.
- The Gulf oil and gas regions should expect at least two possibly three landfalls. At least one of these should be in the Mexican oil belt.
- Florida should expect one or more hits. The state is at equal risk of a hit from the Gulf or Atlantic.
- The Islands should expect at least two hits.
- If Soufriere Hills erupts again, its dust should subtract 3 – 5 storms.

The bottom line is that this looks as if it will be an above-average year with a large number of landfalls. Fortunately, most of these landings will be tropical storms or low-level hurricanes. However, as this springtime’s rains are currently showing, you don’t need high winds for a storm to be very damaging.

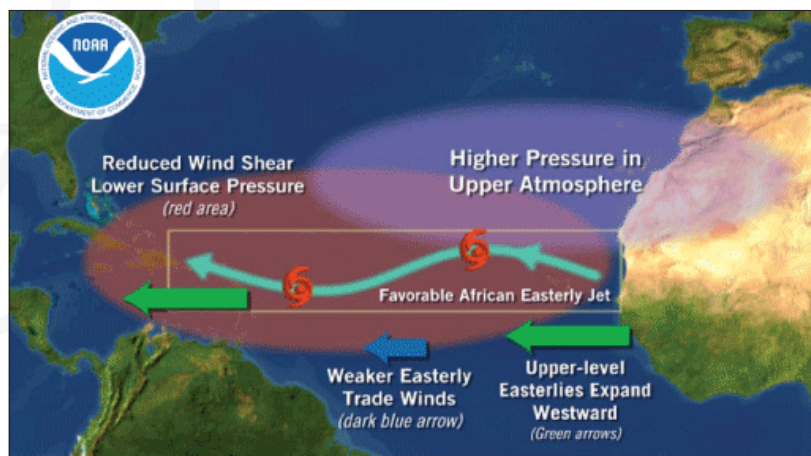


fig. 15 Setting up conditions for hurricane formation

# News Notes



The record breaking rainfall in the Northeast is a terrible example of “volcano weather” at its worst. The ash and chemicals from volcanoes seed clouds, forming dense fogs of micro-droplets that eventually rain out far from the eruption. Unfortunately, this week, clouds seeded from far off Kamchatka and Soufriere Hill in the Caribbean (carried north by a Nor’easter) intersected just as cool continental air met the unusually warm Atlantic.



fig. 16

Between two to eight inches (5 – 20 cm) of rain have poured down on the East Coast from New England through North Carolina. Rhode Island, the smallest state has had the biggest problems, breaking 200 year old records for rain and flooding. Boston, Providence, RI and New York City are recording the wettest March on record.

There has been widespread disruption of power and transportation. The governors of Rhode Island, Massachusetts and Connecticut have declared states of emergency. Unfortunately, for many, the worst is yet to come as many rivers are still rising and the flooding continues. What makes this so tragic is that many of these homes and businesses were already underwater financially and recovery will be difficult to impossible.



The US is not the only place with problems. The strange weather has brought unusually heavy precipitation to normally arid regions in the old Soviet republics. Now, with spring, the rain is combining with snowmelt. In Kazakhstan, the combination of heavy rain and rapid snowmelt caused the failure of the Kyzyl-Agash dam on March 11. At least 43 people were killed, and an additional 300 people were injured. An entire town was washed away. Survivors now get to weather the rest of the Russian winter and tumultuous spring in tents.

The following day another dam was washed away in the nearby Karatalsky district. A village was flooded, but many of the 820 people had already been evacuated.



Further north, in Russia, water is taking a different but equally hazardous form - killer icicles. Russia has had its coldest winter in 30 years and the roofs are lined with icicles. It sounds like a winter wonderland, but with springtime, falling icicles and ice blocks have killed five people and injured 147 in St Petersburg. During the same week, a 55-year-old woman in central Moscow and a pensioner in the southwestern city of Voronezh were also killed by falling icicles. As pedestrians slip and slide over the icy streets of Russia’s cities, they aren’t able to watch out for falling ice from above. Icicles and sky scrapers – it’s a deadly mix.

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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.

*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](http://www.BrowningNewsletter.com/contact.html)*

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