June 2010

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

BROWNING

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A Fraser Management Publication Vol. 35, No.6

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.

In this issue

El Niño – Going . . . Going. . . Gone

SUMMARY: The El Niño that has shaped the last 12 months of weather has vanished. How will the rapid plunge of temperatures in the Pacific shape this summer and the upcoming hurricane season. And – why are climatologists warning that we might have a cool La Niña in the next few months?

Amazing. It was the vanishing act that completely changes this year's climate. The El Niño disappeared!

More Amazing. Last winter's El Niño has already been one for the record books. It usually takes a year or more for the Tropical Pacific to gradually warm up from a cool La Niña to a balmy El Niño. Instead, last year the ocean flipped from one to the other in only three months. By June, the trade winds had weakened, the ocean waters had warmed and the globe began to experience typical El Niño weather.

Amazing continues. Now, against all expectations, the Pacific waters have cooled equally rapidly.

To say that this development is a surprise is an understatement. It was completely unexpected. Until mid-March, most oceanologists were expecting the Pacific to cool and the El Niño to fade out by June. Most models then predicted that the Pacific would remain neutral for the rest of the year. Instead, the temperatures plummeted and the El Niño was gone by the end of March. By the end of April, the temperatures had dropped from above average to below average. By now, the temperatures are -0.9°C (-1.6°F) below normal – technically cold enough to be classified as a La Niña if the cool temperatures continue.

So far, none of this is official. Because there are short-term variations in the Pacific, conditions have to continue for 3 months for climatologists to pronounce the change to be an official El Niño or La Niña. Temperatures dropped to below normal in April, but the official report will be the 3 month running mean.

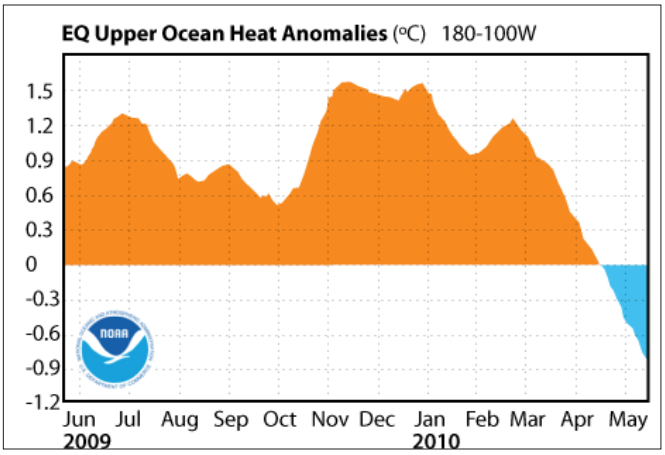


fig. 1 **From El Niño to La Niña in Two Months?**

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

This means that we will be experiencing La Niña-type weather a month or two before it is officially declared a La Niña.

A rise and drop in Pacific temperatures this rapid is rare and has left many scientists baffled. No one knows why the ocean is making such enormous temperature swings so quickly. It also leaves scientific models scattered all over the place. How do you predict future behavior when you don't understand what happened? Most models, reflecting past Pacific behavior, now say that the ocean will be neutral, ±0.5°C (±0.9°F) of normal for the rest of the year. However, temperatures continue to drop faster than most models projected and increasingly models are forecasting a cool La Niña to develop during this summer or fall.

Looking through the past, the only time we saw an El Niño rise and fall so quickly was in the (literally) Swinging Seventies. At the time, the ocean-wide, long-term Pacific Decadal Oscillation **(PDO)** was in its cool phase. Most of the data that current climate models are based on are from more recent data, when the PDO was warm. In 2006, scientists claimed the long-term trend of the PDO turned cool again. It could be that ocean behavior during in the warm and cool phases are very different and using models largely based on the past 25 – 30 years could be very deceptive. **It is noticeable that during the end of the last cool phase of the PDO – from 1968 – 1977 – every year had at least five months of El Niño or La Niña weather. We have seen the same pattern since the PDO cooled again in 2006. It may be that with the cool phase of th PDO, Pacific climate extremes and rapi swings become more common.**

If this is true, it will have profound e fects on the agriculture and, ultimately, th economies of the Pacific Rim.

The Impact on the Upcoming Weather

If, as looks increasingly likely, we hav a La Niña, we are facing so problems. I Niños tend to be benign, especially for U agriculture. La Niñas are not. If one o curred in late summer, it would bring he waves and drought to important agricultural areas.

With the elimination of any storm-suppressing El Niño winds, the probability of hurricanes and intense hurricanes increases.

However, no single factor shapes all the weather. Last month's Late Spring map predicted that the West would be warm and dry – but noted ***"*If the North Pacific volcanoes continue to be active, these regions will be cooler and wetter."*** The volcanoes in Kamchatka continued to erupt at low levels, throwing ash and chemicals between 3 – 5 miles (4.8 – 8.0 km) high.

Typically these smaller eruptions do not affect global weather, but they do affect the weather downwind. In this case, the weather downwind was in Western Canada and the Pacific Northwest. The Inland Northwest has had a cool spring including a record low of 32°F (0°C) at Spokane and the latest spring snow ever recorded at Salt Lake City on May 24. As long as the volcanoes continue this level of activity, this region of North America will continue to be cooler wetter than usual for a La Niña.

The other factor that will be affecting North American weather is the growing warmth of the Atlantic. The Atlantic is undergoing normal spring and summer warming. While the temperatures off the East Coast are still below normal, the Gulf of Mexico is finally becoming warmer than normal. Gulf temperatures are now between 79° – 84°F (26° - 29°C).

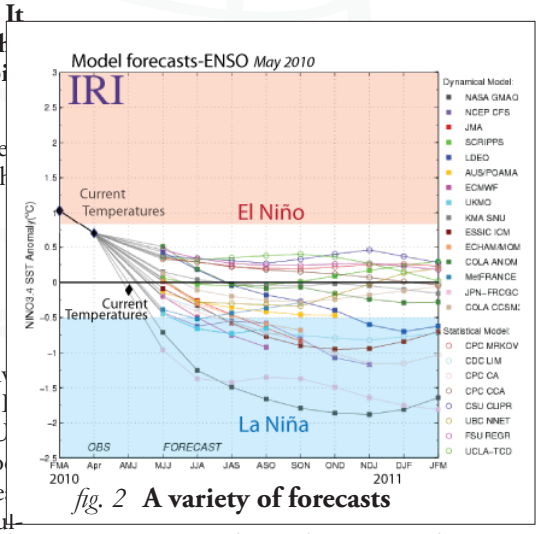


fig. 2 **A variety of forecasts**

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

We are already seeing the results of this warming. This year, as a whole, has had a relatively low level of tornado activity, but it is now ramping up. In order to have tornados, you need a collision between warm moist air (which, in the US, usually wafts north from the Gulf) and a dry cold front. The two create strong thunderstorms and, with the right wind conditions, tornados.

Normally the US has tornados all year long. In winter, they typically occur along the Gulf Coast, since that is as far as the warm Gulf air penetrates. This year, the cold Arctic air surged so far south that is almost eliminated. For example, the average number of tornados in February is 78. This year, there was only one February tornado, and it was a 3 minute event in California!

It was not until mid-April that the Gulf began to warm up enough to be favorable for tornados and they developed with a vengeance. April had at least 197 tornados and May saw 1000-year levels of flooding in Tennessee, Kentucky and Northern Mississippi.

Additionally, the warm Gulf temperatures are creating ideal conditions for tropical storm and hurricane development. The rapid disappearance of the El Niño and strong probability of a La Niña during September, the hurricane season's busiest month, increases:

- The probability of Gulf Coast landfalls – Expect at least 3 landfalls in the Gulf oil and gas regions. Unfortunately this means a good probability of a storm hitting the oil spill region. So far, opinions are divided over what would happen if a hit occurs, but the combination of oil saturation and violent storms in the wetlands would not be good. Expect at least one of those storms in the Mexican oil region.

The probability of East Coast landfalls - Expect at least 2 landfalls in Florida and the East Coast. Typically, during La Niñas, North Carolina gets a hit or near collision.

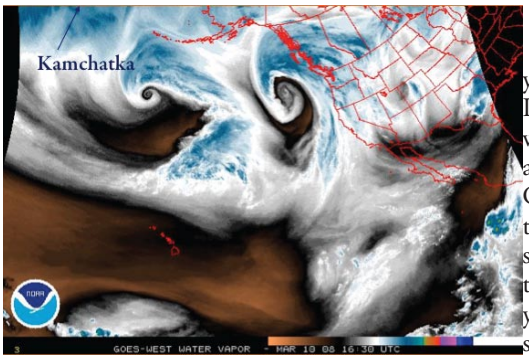


fig. 3 **Even moderate eruptions can enhance Pacific storms**
courtesy NOAA/GOES

- The intensity of storms – With the elimination of any storm-suppressing El Niño winds, the probability of hurricanes and intense hurricanes increases. Expect at least 9 or more hurricanes and 4 intense ones.

When the warming Atlantic, cooling Pacific and erupting North Pacific volcanoes are combined, they have the potential to create some very stormy weather.

EARLY SUMMER – In 80% of similar years, Canada and the US w ere, with the exception of the Southern Plains, warm and dry. 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. Notice, if the volcanoes continue at their current low level, the Pacific Northwest and Central Rockies will be cooler and wetter.

LATE SUMMER – Every similar year with a La Niña had a heat wave. 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 80% 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.

AUTUMN – Early autumn should bring more rainfall, but not necessarily any relief from the heat. In similar years, the Southwestern US and most of North America east of the Rockies are usually several degrees warmer than normal. At the same time, in 80% of similar years, the rainy Southwestern monsoon lingers longer and penetrates deeper into the Rockies and Central Plains. The hurricane season should be busier than normal, bringing increased moisture to the Gulf and Southeastern coasts. In 60% of similar years, Eastern Canada, the Northeast, the Midwest and Mid-Atlantic states have been dry.

Remember, volcanoes are the wild card in this picture. A large eruption in the North Pacific (10 miles or 15 km high) will bring cooler, wetter weather to the East and Midwest. If the eruption is mid-sized (over 3 miles or 4.8 km) it normally focuses its impact on the Pacific Northwest. Otherwise, we are facing a very hot and stormy summer.

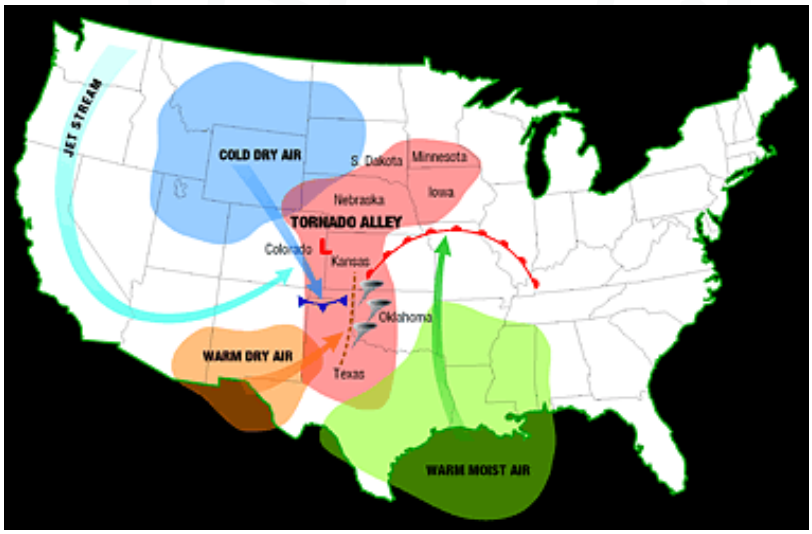
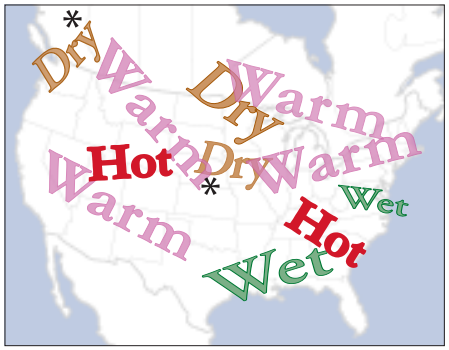


fig. 4 **What drives Tornado Alley storms**
http://www.nssl.noaa.gov/primer/tornado/tor_climatology.html

Early Summer



Late Summer

Autumn

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

figs. 5-7

Cool 2°C or more lower than normal temp.

Hot 5ºC 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

Changing Climate – Changing Societies

SUMMARY: The Atlantic Multidecadal Oscillation (AMO) has changed weather patterns on both sides of the ocean. In both the Middle East and Mexico this has led to droughts, hardship, urbanization and violence.

"There is a tide in the affairs of men.
Which, taken at the flood,
leads on to fortune
Omitted, all the voyage of their life
Is bound in shallows and in miseries."

Julius Caesar Act 4, scene 3, 218–224

Sorry, Shakespeare, it's an oscillation, not a tide.

If you have read the *Newsletter*, you have read seemingly endless discussions of oscillations. Dozens of these atmospheric (or combined ocean-atmospheric) patterns shift temperatures, winds and rainfall around the globe. From the short-lived North Atlantic Oscillation to the decades-long Pacific Decadal Oscillation, these patterns swing weather from one extreme to another.

Flora and fauna shift with the weather. Birds migrate. Herds of animals travel from water hole to water hole. When temperatures warm, belts of vegetation expand north and into higher altitudes.

Climate oscillations are predictable. So are the movements of people in vulnerable areas. Two seasons of drought and nomads must move their flocks. Two years of drought and peasants begin to abandon their lands and seek food elsewhere. There is a tide – an ebb and flow of people in and out of weather-stricken lands.

It is hard for Westerners, with their cities and air conditioning, to recognize these tides. Most of the world, however, is populated by societies far more vulnerable to changing weather. Climatic oscillations shift growing conditions and ultimately people ebb and flow in response to these conditions. Human tides are moving and they are lapping on the shores of Western lands.

The AMO and the Middle East

Some of the most dramatic movements have been around the Atlantic Ocean. For thousands of years, the shifting oscillations have dramatically altered the climate and societies of Europe, Africa, the Middle East and the Americas.

The impact has been particularly dramatic in the Middle East because only 10% of that region's water supply is permanent. The rest decreases periodically, leaving people the choice of coping with drought or moving.

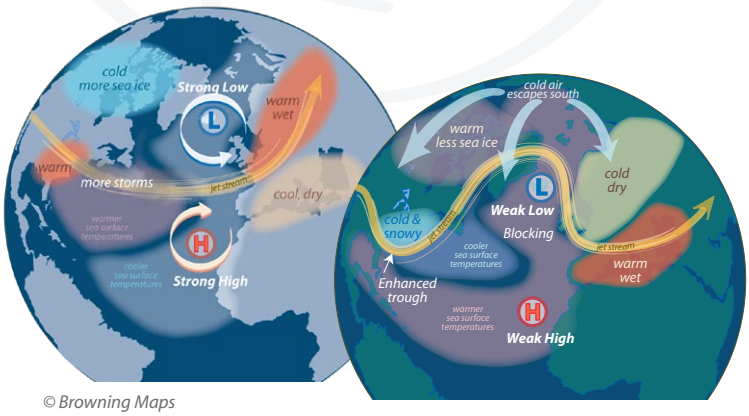
The two Atlantic oscillations responsible for these increases and decreases of rainfall are the North Atlantic Oscillation **(NAO)** and the Atlantic Multidecadal Oscillation **(AMO)**.

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. There is a permanent low air-pressure system over Iceland **(the Icelandic Low)** and a permanent high air-pressure system over 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.
- **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 surge 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.

Normally the NAO switches several times a year, even several times a season. This past year, there have far more days with negative NAOs than positive. Climatologists, like Dr. William Gray of Colorado State University, have discovered a long-term pattern. Typically there seem to be about 40 - 50 years with positive NAOs, followed by 25 - 30 years of mostly negative NAOs. Then the pattern flips back to positive again.

This 70± year cycle, the Atlantic Multidecadal Oscillation **(AMO)**, is tied to the northward flow of the Atlantic's tropical waters. Ocean currents, like rivers, have periods of rapid flow and times when the current slows down. For a number of decades the waters flow rapidly and the Atlantic is



figs. 8-9
Positive NAO *(left)* more common before 1995
Negative NAO *(right)* more common after 1995
These have vastly different effects on the weather of North America & Europe.

very warm. (The Gulf Stream is one of these currents.) Then gradually the waters slow down and the ocean cools.

As the NAO graphic shows, the different air pressures are related to the temperature of the Atlantic Ocean's waters. During most of the 1970s, the 1980s and until 1995, the current was slow, the ocean was cool and conditions were ideal for the positive NAO pattern. In 1995, the Gulf Stream began to flow faster, temperatures warmed and the negative NAO became the norm.

In the US and Europe, the most noticeable impact was the temperature extremes. Cold stormy winters, like last winter, became more common. Then when summer came, tropical temperatures soared north, baking both regions.

What people in more arid regions noticed, however, was the shift in rain patterns. Repeating, the Middle East, where only 10% of the regional water supply is stable, proved particularly vulnerable.

Notice - when the Atlantic is warm and negative NAOs are more common - the rainfall in most of the Middle East retreats to the historical "Fertile Crescent". The impact is particularly hard on Iran. As pointed out in the January ***Browning Newsletter,*** in Iran:

"Only the coastal plains along the Caspian Sea and the valleys in the Zagros Mountains, a range that stretches along the nation's western border, have good precipitation. . . Due to poor soil and widespread problems with water availability, only

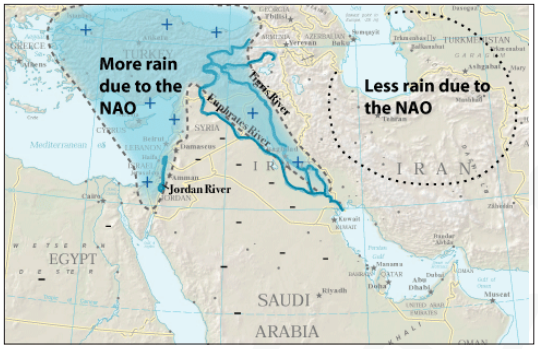


fig. 11 **Middle East rainfall patterns shift when the NAO turns positive.**

12% of the land is under cultivation**. . . with 70 million people and only a relatively small area producing food, Iran is very vulnerable to even minor changes in precipitation."**

Of course, the AMO is not the only oscillation affecting the region. The Pacific's El Niño tends to bring increased precipitation throughout the entire Middle East. La Niñas bring drought. But in general, no matter what phase the Pacific is in, the warm AMO brings increased dry weather throughout the region. If history repeats itself, we can expect this precipitation pattern to continue for the next 15 to 20 years.

Historically, during the cool phase of the AMO, when the Middle East has more precipitation, populations expand. As numbers grow, farmers and nomads move out into the more marginal lands. This lasts for around 25 – 30 years, over a generation. Then the Atlantic warms and there is less rainfall. The enlarged population is forced to retreat to regions with more reliable water supplies. There are large movements of Shiite Muslims of Iran towards the Tigris in Iraq and western Arabs towards the coastal regions of the East Mediterranean.

This pattern has existed for millennium. It is happening now. Fortunately, for the first 15 years since the cycle changed in 1995, drought-stricken farmers and nomads retreated to cities, rather than crossing national borders. (Iran now has one of the world's highest urban growth

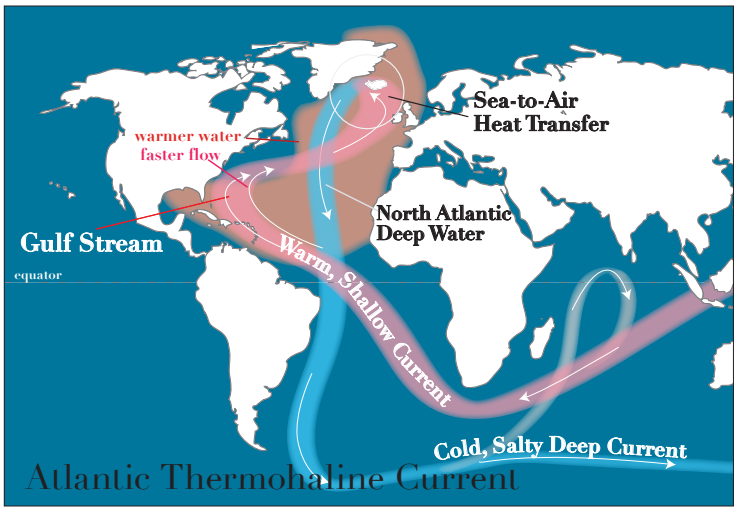


fig. 10 **The speed of the tropical currents shapes the warm and cool phases of the AMO.**

Recent Precipitation Anomalies in the Middle East

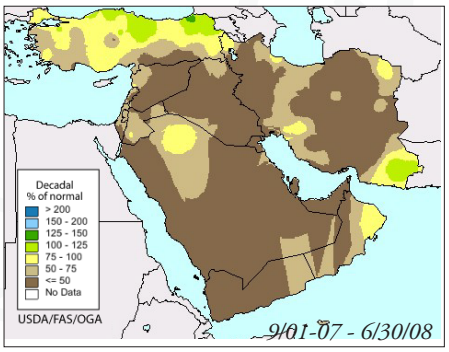


fig. 12 **During La Niña: Winter Growing Season**

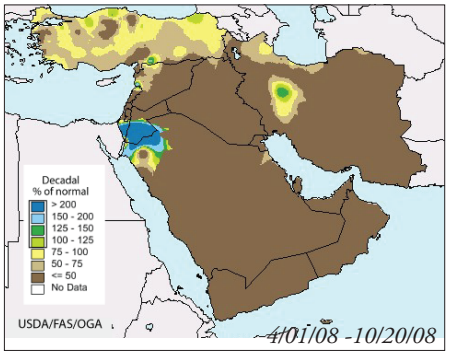


fig. 13 **During a neutral Pacific: Summer Growing Season**

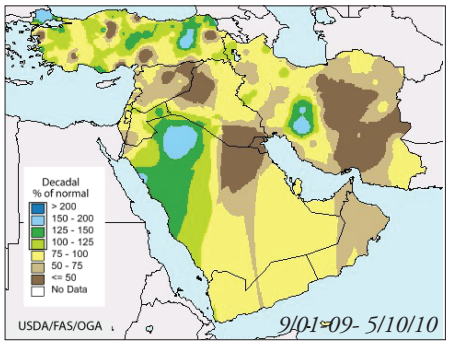


fig. 14 **During an El Niño: Winter Growing Season**

rates. Over 68% of Iranians live in cities and experts expect the numbers to grow to 80% over the next 20 years.) However, as the recent Iraq bombings and Iranian demonstrations have shown – these growing cities can be very volatile.

Last year had a strong El Niño, with comparatively good rain. Regional crops and pastures were good and food was affordable. We are facing a neutral Pacific, even a possible La Niña. Rainfall and crops will be reduced. Expect both food prices and Middle Eastern unrest to escalate.

The AMO and the American Southwest

Across the Atlantic, another dry region is facing increasing tension from the changing climate. As recent controversy over Arizona and its new law has shown, the Mexican/US border is facing increased unrest.

Like the Middle East, the borderlands between Mexico and the USA are mostly desert and mountains. Unlike the Asian lands, the amount of rainfall the AMO brings to the region is largely determined by tropical easterly winds rather than subtropical westerlies. Also, the cycles of the Pacific shape the Americas more directly than they shape the weather in the Middle East.

In wintertime, tropical warmth retreats and the borderlands get their moisture from the Pacific. In summertime, the region receives its rain from the Pacific monsoon in the West and the tropical winds blowing moisture inland from the Gulf of Mexico. Years with precipitation from all of these sources are green. Years when none are contributing, can turn the region to a barren wasteland.

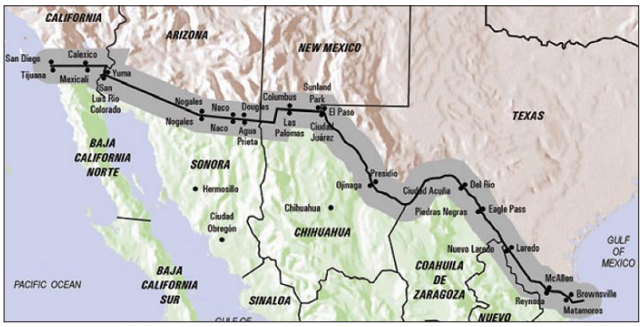


fig. 17 **The US- Mexican Border: A land of deserts & mountains.**
http://konexinfo.files.wordpress.com/2010/01/mexico-us-border.jpg

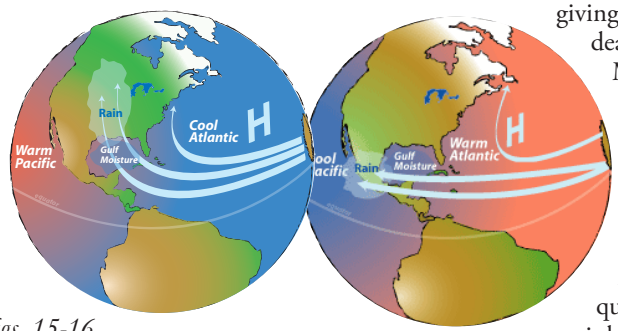
The El Niño cycle controls the moisture from the Pacific. The AMO shapes where the moisture from the Gulf of Mexico flows. If the AMO is in its cool phase, the east-to-west tropical trade winds are weak. The corolis force of the rotating Earth deflects the winds to the north. Typically, when the Pacific is warm, the winds are weakest and the torque to the north is strongest. The moisture from the Gulf of Mexico is carried due north, deep into the US Great Plains and Canada. Huge regions of north and central Mexico are left relatively dry. This can be disastrous for Mexico's largely agricultural population.

Now the opposite is occurring. Since 1995, the AMO has grown warmer and the trade winds are stronger. This means there is less diversion of the winds and they are more prone to flow horizontally from east to west. Less Gulf moisture is being diverted into the US and more is flowing directly into Mexico. The cooler the Pacific waters are off the West Coast, the stronger the trade winds and the less moisture reaches the US. For example, during the 1998 La Niña that lasted until June of 2001, the Southwestern US experienced (according to paleoclimatologists) the worst drought in 500 years. Massive wild fires swept the West and the grasslands of Texas and Oklahoma.

These dramatic fluctuations of life-giving rainfall have led to a great deal of mobility between Mexico and the Southwestern US. Indeed, it is a widely accepted theory that the Aztecs originated around the Lake Powell area (the border of Arizona and Utah) before they migrated south and conquered Central Mexico. Certainly archaeologists have found the Southwestern tribes have many cultural similarities to Mexican tribes including parrot clans and calendars. The Southwestern ruins show Mexican style architecture, ball courts, astrology towers and colonnades as well as Mexican artifacts.

This flow north and south continued after the region was conquered by the Spanish and during its relatively brief period as part of Mexico. It was only when the Southwest became US territory that the historical flow became an international issue. During the cool AMO of 1902 – 1925, Mexico experienced widespread peasant revolts, culminating in the Mexican Revolution. The violence continued into the 1920s. The US military eventually became involved, seizing Veracruz, Mexico in 1914 and forcing President Huerta, to resign. Two years later President Wilson sent General Pershing with 10,000 American soldiers into Mexican territory in retaliation for General Pancho Villa's raid on Columbus, New Mexico. After 11 months, Pershing was forced to return to the U.S. without ever catching sight of Villa.

This is also the time that the first significant wave of Mexican workers began to flow into the United States. The United States curtailed Chinese and Japanese immigration and the pool of cheap Asian labor dried up. Mexicans were recruited by the railroads and mines to fill the vacuum. Recruiting increased sharply when the Unites States entered World War I. After the war, nativist sentiment led to the creation of the U.S. Border Patrol, aimed at cutting back the flow of Mexicans. But economic demand for unskilled migrant workers continued throughout the Roaring Twenties, encouraging Mexican immigrants to cross the border—legally or not.



figs. 15-16
Cool AMO *1995 & earlier*
Warm AMO *1999-present*

The situation in Mexico and US/Mexican border relations eased in the late 1920s and 1930s. While Mexico did experience some droughts, the AMO was warm and Mexico received more rainfall. (Indeed – some of the horrible droughts the US experienced in the 1930s and 1950s occurred when most of the Gulf moisture was directed into Mexico.)

Then, in 1964, the AMO cooled again. By the 1970s, Mexico once again experienced severe drought. Census records showing 22% of the nation's croplands lost to drought, with as much as 67 – 70% losses in Mexico's border states. In desperation, Mexicans turned north. They found jobs waiting for them and the flow has not stopped since.

Phases of the AMO last for decades. From 1983 – 1988 Mexican inflation increased 100% while the economy stagnated. Mexican unrest and violence increased. Rural populations poured into both Mexico City and across the US border. The economy slowly began to recover, only to crash again in 1994 when the government devalued the peso. The value of the currency halved, inflation soared and the nation faced another brutal recession. The Mexican middle class lost their savings and joined the rural poor in the migration to the US.

In 1995, the AMO switched. Once again the tropical trade winds began to direct Gulf moisture into Mexico, but it was a very different nation. Mexico's rural districts had emptied and by now over 74% of the nation lives in cities. Mexico City exploded into the second largest city in the world, containing one fifth of the nation's entire population. By 2000, over 9% of Mexico's population had moved to the US.

Moreover, as the Mexican economy crashed again and again over three decades, a new type of economy rose to take its place. Immigrants here send $20 billion home to their families in Mexico – the nation's second largest source of external finance, just behind oil exports. (Indeed, in 2003, President Fox noted that the roughly 20 million Mexican-origin workers in America create a larger gross product than Mexico itself.) Impoverished states were transformed into narco-states, replacing the crashing economies of agriculture and pesos with trafficking and US dollars.

Even a shift in the AMO and more benign growing conditions will not restore Mexico to what it was. Networks now connect certain communities in Mexico to specific cities in the U.S.— Puebla to New York, Michoacán to Chicago, Jalisco to Boston. As migration has grown, these networks have proliferated. In some towns, leaving home to work in the United States has become a rite of passage for young men. (When my son spent a summer in Guanajuato, doing public health work, he found that every home but one in his village had a member of their family working in the US.)

Indeed, much of the current violence that is tearing Mexico apart can be seen as a clash between the old and new economies - the legitimate economy and the illegal economies that sustained the nation through the desperate times of the 1970s 1980s and 1990s. President Felipe Calderon declared war on the cartels in late 2006 and deployed 45,000 soldiers to fight organized crime. As the government has weakened some gangs, others moved in to fill the power vacuum. As a result, the murder rate has soared. The three sided battle between government forces, the Juarez cartel and the Sinaloa cartel has left Ciudad Juarez, in the words of journalist Tim Johnson, "Murder City, probably the most dangerous city in the world outside a declared war zone." As it has in the past, the civil violence in Mexico has poured across the border.

Conclusion

When climates shift, so do populations. On both sides of the Atlantic, changes in the AMO have led to dramatic population movements. On both sides of the ocean, the authority of international borders is at risk. Both Mexico and the Middle East suffered enormously during the droughts caused by the AMO.

What Mexico is showing, however, is that even when the drought is alleviated, the violent institutions that were created by hard times remain. The cities created by refugees remain tumultuous. The borders violated in hard times will continue to be violated in good times.

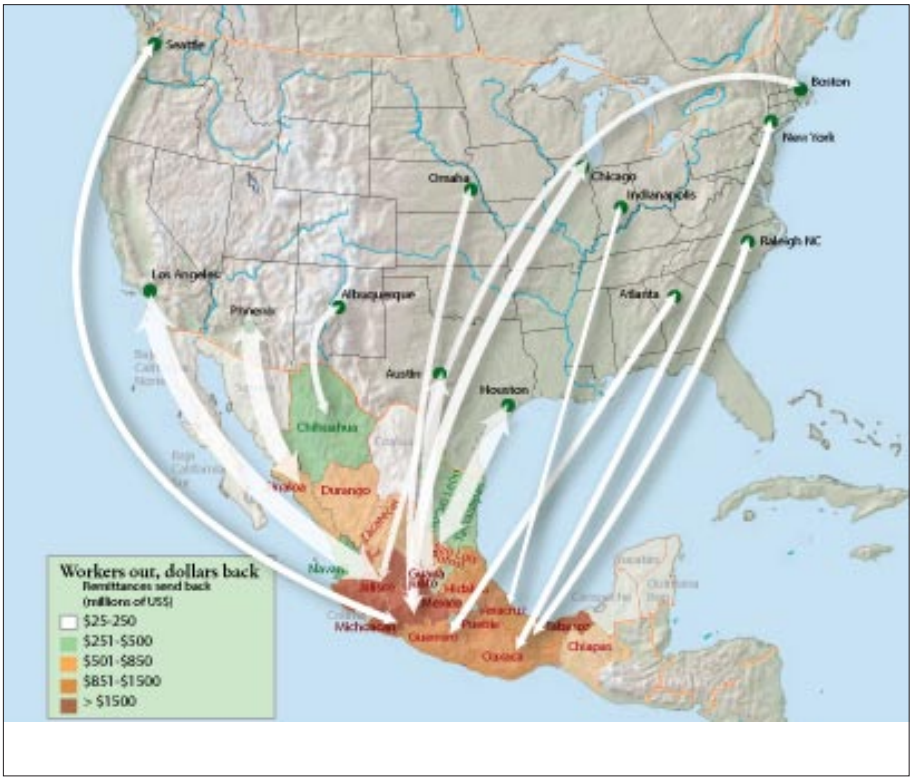


fig. 18 **Emigration affects Mexican & US states unequally**

data: US census, Banco de Mexico, World Bank, based on research by Matthew Quirk/Atlantic and Raúl Hernández-Coss

News Notes

There is good news and bad news coming from Iceland.

Good News - As of the 26th of May, the Institute of Earth Sciences reported that it seems that the eruption of Eyafjallajökull volcano has finally ended. While there is still a considerable steam plume rising from the crater, no fresh ash or lava emissions have been observed since the 23rd of May. However, the volcano has a history of stopping and starting, so we may be seeing more activity from the volcano with the world's most unpronounceable name.

Bad News - Scientists are warning that many more of Iceland's volcanoes seem to be stirring and Europe may be facing decades of ash clouds. A team led by Thor Thordarson, a volcanologist at Edinburgh University has reconstructed a 1,100 year timeline of Iceland's volcanoes and found that the eruptions occur in regular cycles. According to an interview with Thordarson by the Times On Line, "The frequency of Icelandic eruptions seems to rise and fall in a cycle lasting around 140 years. In the latter part of the 20th century we were in a low period, but now there is evidence that we could be approaching a peak." Two of Iceland's largest volcanoes, Katla and Hekla are showing signs of reawakening.

Beware the zud! That innocent sounding word is the Mongolian name for a winter with a prolonged period of heavy snows and paralyzing cold. This year's zud has followed a punishing summer drought that baked much of Central Asia. Now, according to the United Nation, Mongolia, a nation that treasures its nomadic heritage from the days of Genghis Khan, has lost 17% of its livestock. This has left the nation in financial and social turmoil.

Once in a while a story is beautiful enough that it should be reported. Last February 11, NASA launched a satellite that is designed to study the sun. This new vessel, the Solar Dynamics Observatory studies solar activity using several different instruments simultaneously. It is not only giving us insights into how the sun works, but hopefully will give us new information about the storms and flares that can cause so much damage to Earth's satellites and power grids. Meanwhile it produces incredible pictures, like this one which observes the seemingly quiet sun on three different wavelengths and shows the seething heart of our star.

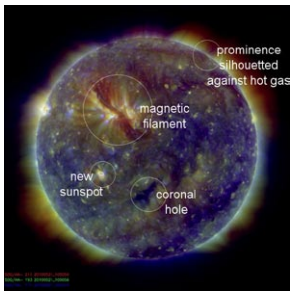


fig. 19 courtesy NASA

What has been the biggest, most profitable investment in the past two years? Gold? Oil?

No – garlic! Garlic prices in China have increased 605% to $1,200 per ton from March 2009 through February 2010. They settled briefly in April but are on their way up again.

Basically, it all began in 2008 when there was a glut of garlic. Prices plummeted, so China, which is the world's No. 1 supplier, cut its output by half in 2009. Then the swine flu struck. Garlic cloves are a Chinese folk medicine, so, suddenly everyone was buying the spice. China was sold out by May. It made the US shortage of flu shots look like a picnic.

Since then speculators have made their fortunes speculating on garlic prices. Since there is no futures markets, speculation means going out and actually buying lots and lots of cloves and hoarding them. Of course eventually all bubbles burst. The new crop will be harvested and prices will drop. Someone will literally be left holding the bag. And in this case – the bag is going to stink.

The **Browning Newsletter**
is published by

Fraser Management Associates

a Registered Investment Advisor.
For more information or an informational brochure
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The opinions expressed are those of the writer, and although they are based on extensive studies of physical data and phenomena, many statements published here are not entitled to be regarded as rigorously proved in a scientific sense. Some decades must pass before these issues are resolved. Meanwhile, decisions must be based on the best available information and estimates.

This newsletter will **not** contain:

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

VOLCANO UPDATES

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

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