

BROWNING

©Evelyn Browning Garriss

NEWSLETTER

A FRASER MANAGEMENT PUBLICATION

Battleground States

IN THIS ISSUE

- The tropical Pacific is now neutral, filled with disruptive Madden-Julian Oscillations that will act like mini-El Niños and La Niñas throughout the winter.
- The current climate patterns historically have been good for South American crops, and bring moisture to the coasts of North America but do not deliver enough precipitation to the interior of the US to relieve the long-term drought.
- The long-term changes in the Atlantic and Pacific changed the reliability of several major natural disaster alerts, including those for Atlantic Hurricanes and El Niños.
- According to NASA, new drought warning system, based on satellite readings of plant stress can predict droughts a month ahead of time.
- The coral reefs in the South China Sea shrank by 80% in the last 30 years.

CONTENTS

1 Battleground States

Middle latitude nations like the US are battleground for conflicting Arctic and tropical oscillation cycles. How are these shaping this winter's weather?

3 The New Normal - Warnings

Changing science and long-term ocean phases have changed the reliability of several disaster warning systems. Which ones have improved and which are less reliable?

8 NEWS NOTES

→ SUMMARY

Between the volatile tropical Pacific, with disruptive Madden Julian Oscillations, a hot Atlantic and a lop-sided Arctic airflow, the winter is shaping up to be stormy along the North American coasts but not have enough moisture to break the drought in the continental interior. Temperatures in the Midwest and East will be volatile but average normal to slightly above normal.

It is not safe to be in the middle of a battleground. This winter, the US is suspended between unusually hot tropical and unusually cold Arctic weather patterns. As they clash, Americans find themselves dealing with the extremes of drought and travel-disrupting storms. And it's only the beginning of winter. What in the world is next?

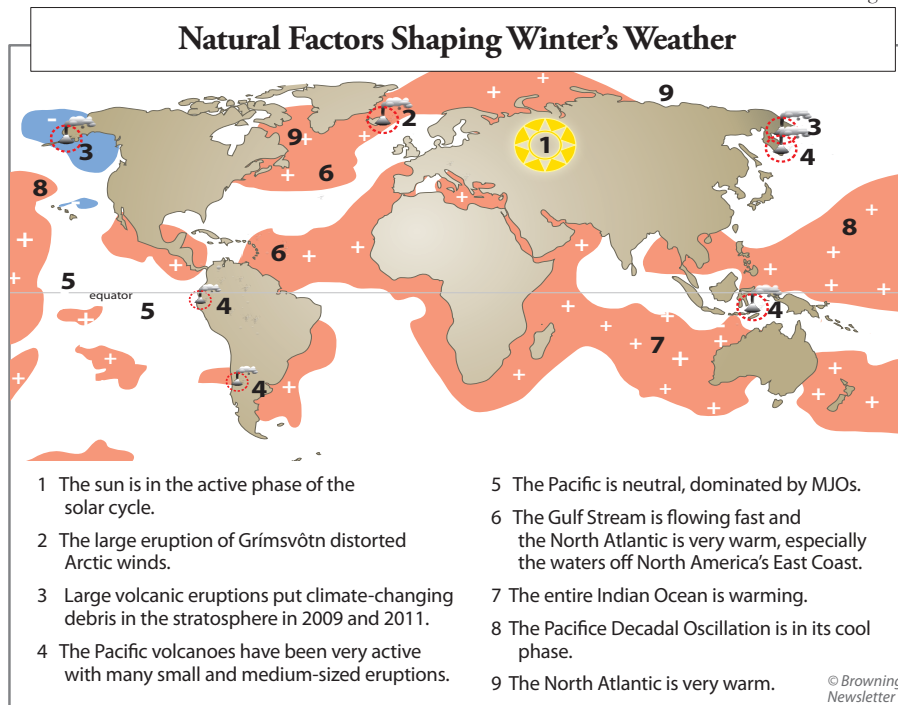
The answer is being shaped by climate patterns forming thousands of miles away.

Tropical Heat

For eleven months, the US weather was dominated by the tropics – from the rapid flow of the Gulf Stream in the Atlantic to the wavering temperatures in the tropical Pacific.

THE ATLANTIC – The impact of the Atlantic was straight forward. The Gulf Stream and other streams of the massive Atlantic Thermohaline Current carry water from the South Atlantic to the north before sinking deep into the ocean south of Iceland. This means hot tropical waters are carried

fig. 1



This newsletter contains articles, observations and facts to support our contention that man is significantly influenced by the climate in which he exists.

Our calculations show the climate, over the next term, will cause dramatic changes in our social and economic patterns. We feel that the reader, attuned to the changes that are occurring, may develop a competitive edge; and, by understanding his now and future environment, can use the momentum of change to his advantage.

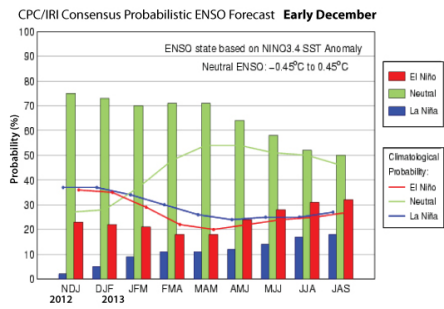


fig. 2 Warm, cool, or neutral? International scientists are divided on likely Pacific conditions http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

across the tropics, along the North American shoreline, then across the Atlantic towards Europe. This year the flow of these streams was unusually rapid and both the US and Southern Europe were blasted with unusually warm temperatures.

The Atlantic has cooled but it is still unusually warm in portions of the Gulf and off the East Coast north of the Carolinas. This allowed unusually warm temperatures to flow into the continental interior in early and mid-December. It also means that there is plentiful moist marine air for storms in the eastern US. This will fuel tornados along the Gulf and heavy snow in portions of the Northeast and Midwest.

At the same time, the northernmost portions of the Atlantic are also warm. This typically means that when the Arctic chill finally expands south in the Western Hemisphere, it will plunge deep into the cooler continental land mass. It increased storminess, wrecking Christmas travel, and it looks as if the first week or two of January may be as stormy.

THE PACIFIC – While the Atlantic has had a steady flow of warmer than average temperatures, the Pacific temperatures have been wavering. The year started with the tropical Pacific in a cool La Niña pattern. It began warming and by March the La Niña had ended. By August, the waters were experiencing warm El Niño conditions. Experts around the world were predicting the conditions would linger through winter. Then, in late September, a small Madden Julian Oscillation (MJO), a localized region of windier weather and cooler water began to drift eastward through the El Niños warm waters, scrambling and cooling the region. While western portions of

the El Niño are warming again, the eastern regions are cool. Experts around the world seem confused about the future development of the area, as the latest summary published by Columbia’s International Research Institute for Climate and Society and the US Climate Prediction Center shows. When surveying the major climate and weather services of the world, roughly 37% predict a wintertime return to cool La Niña conditions, almost as many expect a warm El Niño and 27% expect a neutral ocean. Confusion reigns!

What this indicates is that while the tropical Pacific is officially neutral, it is very unstable. The surface churns warm, then cool. Instead of the large tropical El Niño that would have helped bring increased moisture throughout the winter, the conditions in the Pacific will be like a series of alternating mini-El Niños and La Niñas. As the cool MJO dominated the conditions in the tropics, we experienced a return of severely dry weather in the mid-continent. The warm MJO will

bring more moisture but it’s impact will be relatively short-lived, not long enough to repair the drought conditions wrought by the two year La Niña of 2010 – 2012.

These MJOs brought the flooding rains that drenched the West Coast in early December. These floods were part of a phenomenon called a “Pineapple Express” The moist plume of a tropical MJO is caught in the Pacific jetstream and pours, like a river, into the West Coast. The rainfall drenched the coast, and was driven north, raining on Canada and finally bringing moisture to portions of the Midwest and East Coast. Meanwhile, areas further south remained warm and, mostly dry.

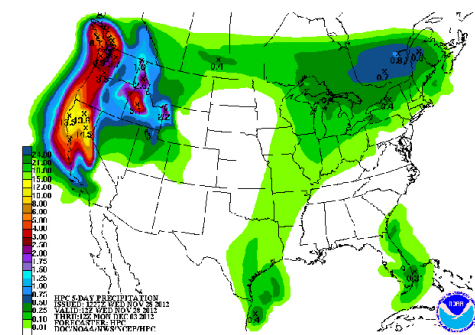
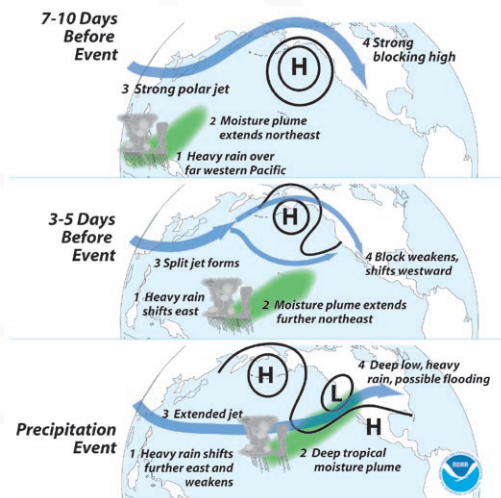
As the MJO flowed east, precipitation began to enter more easterly portions of the nation. Tornados pounded the Gulf Coast, record snowfall buried Arkansas and storms paralyzed Christmas travel. Portions of the Midwest and East received over an inch (+2.5 cm.) of precipitation. Unfortunately, while this provided some relief, this was not enough to reduce most of the long-term drought that has parched the nation.

MJOs take weeks to finish their circuit. Expect the pulse to continue to bring rain until it has passed. It will be followed by a drier pulse, then another wet MJO. In short, the tropics will provide some moisture, much more than last winter, but not enough to end widespread drought conditions. The interior of North America, particularly regions west of the Mississippi will begin spring in drought conditions. This means the outlook for the US winter wheat crop is bad.

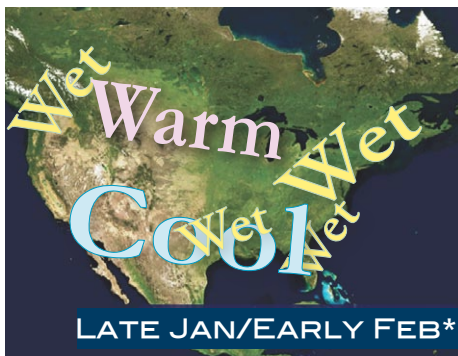
The Arctic

So far this winter, most of the action has been in Russia.

One of the factors that can shape the Arctic weather patterns are high latitude volcano eruptions. In 2011, large volcano eruptions in the North Atlantic (Iceland’s Grimsvötn and Russia’s Sheveluch) poured ash and chemical debris into the polar stratosphere. This screened out sunlight, changing temperatures, air pressure and wind patterns. The winter of 2011 – 2012 produced weather patterns we haven’t seen since the polar eruptions of 1783/1784. The strong Arctic winds trapped cold air north, letting North America bask in a warm winter.



figs. 3-4 The Pineapple Express setup (top) and the result: 5 day rainfall totals: Nov 28-Dec 3, 2012 (bottom) top: © Browning Newsletter, data: NOAA bottom: courtesy: NOAA



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

figs. 5-7*. Moderate eruptions in the North Pacific will bring more moisture to the west.
© Browning Newsletter

Don't expect that type of winter again for another couple of centuries.

In 2012, Iceland's volcanoes were quiet while Russian volcanoes had only moderate to small explosions. Currently eastern Russia's Kamchatka Peninsula is very active but the only large eruption, Plosky Tolbachik, has been spewing 1,200 metric tons of lava every second – a record amount – not exploding into the stratosphere. Indeed, the eruption has been a major tourist attraction. Many Russians interpreted its activity as an ill omen for the end of the world.

It certainly felt like the end of the world for them. While the Arctic winds kept the cold away from the US in early December, they plunged the polar cold deep into Russia. Russia endured its harshest winter in more than 70 years, with temperatures as low as -50°C (-58°F) in Siberia and -25°C (-13°F) in Moscow. The temperatures were 10° to 15° C (18° – 27° F) cooler than normal, the coldest weather since 1938. The plunging temperatures broke pipelines throughout the nation, leaving thousands without heat or water. Heavy blizzards swept the nation, paralyzing traffic.

The lopsided flow of Arctic air finally moved away from Russia. Unfortunately, there is a strong probability that it will stream into the Midwest and/or Northeast in early January. The probability of this happening is increased due to the unusual warmth of the North Atlantic.

Conclusions

The US and Canadian weather is being shaped by a neutral tropical Pacific with wide temperature swings, a cool PDO and a volatile Arctic. The result, historically, has been years with wide weather swings that bring precipitation, but not enough to break the drought conditions in much of the Central and the Southwest. Meanwhile, the two coasts and central and eastern portions of the Midwest, between Pineapple Expresses and Nor'easters should receive plentiful moisture. Temperatures should plunge in early January but warm again in mid-to-late January and early February. Overall, temperatures in the prime Eastern and Midwestern markets for heating should be average to slightly higher than average, with wide swings.

Looking at the patterns that have occurred this winter, compared to previous expectations, the surges between cold and warm weather, occurred about 3 weeks later than predicted.

At this time, spring is still hazy. In 60% of similar years, spring, particularly early springtime, was warmer than average throughout most of the nation and had plentiful rainfall in the Great Plains and Canada's Prairie Provinces. However, it will be important to see if the tropical Pacific remains neutral, warms again, or as 37% of models suggest, returns temporarily to drought producing La Niña conditions. At this point, it appears that it will be neutral with volatile swings, which combined with a hot Atlantic, promises an extremely stormy season.

The New Normal – Warnings

— SUMMARY

Insurance companies and individuals are facing more climate-related disasters. At the same time, the reliability of several climate disaster-warning systems have changed, due to changing large-scale ocean oscillations. Drought warning have improved, but tropical storm and El Niño warnings have become less reliable.

2012 was a bad year for the US insurance industry. From crop-destroying droughts to Hurricane Sandy, derechos and tornados, 11 billion dollar disasters slammed the nation last year. These cost

an estimated 349 lives and over \$60 billion in payouts according to initial estimates by the National Oceanic and Atmospheric Administration (NOAA). Appallingly, this is less than 2011, when the nation had 14 billion dollar disasters, or 2005 when the US was pounded by multiple hurricanes.

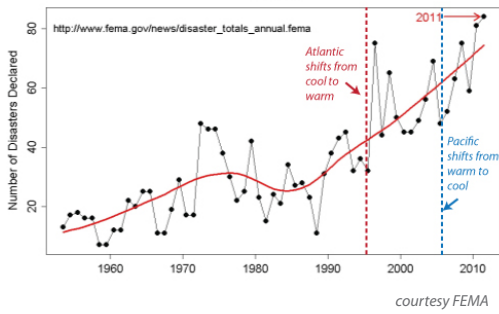
According to Swiss Re, a leading catastrophe reinsurance company, this year's global insurance payouts for disasters, totaled \$140 billion. This was less than 2011's total of \$380 billion — the highest in history — or 2010's \$218 billion.

As a new study in *Science* pointed out, weather and climate related insurance

losses today average \$50 billion a year. According to the study's author Evan Mills, a scientist in Lawrence Berkeley National Laboratory, "These losses have more than doubled each decade since the 1980s, adjusted for inflation."

Experts warn the insurance industry, the world's largest business with \$4.6 trillion in revenues, that things will get worse, with climate change likely bringing more (and more extreme) heat waves, droughts, floods and possibly hurricanes. According to Munich Re, North America saw the greatest increase in weather disasters compared

fig.8 The number of declared natural disasters in the US has risen sharply over the decades.



with other continents, with five times more since 1980. Asia ranked No. 2, with a four-fold increase, and South America ranked last with a 50% increase.

It is increasingly important that nations and individuals heed the warnings for upcoming disasters and make preparations. **Unfortunately, recent large-scale changes in the oceans have weakened these weather-warning systems.**

The Problem With Natural Disaster Warning Systems

Long-term patterns in both the Atlantic and Pacific Oceans have been reversed. The oceans comprise 71% of the Earth's surface. When they change – global climate changes. In 1995, the 60 – 70 year Atlantic Multidecadal Oscillation (AMO) became positive, warming the North Atlantic. Starting in 1999 and tipping in 2006 the 50 – 60 year Pacific Decadal Oscillation (PDO) reversed, warming the seas around Asia and Australia while cooling the American coastlines.

This not only shifted temperatures, but also altered precipitation. Since 1995 we have seen more Atlantic hurricanes and since 2006, more crop killing heat waves and droughts. Many of the patterns that we depended on have changed. Worse yet, the patterns that allowed governments to warn their citizens have changed.

During the five decades when the patterns were different, millions of people moved into regions that are now high-risk areas. (For example – over 50% of Americans moved to within 50 miles of the coasts – putting themselves and valuable infrastructure at increased risk from hurricanes.) Secondly, many of the protective structures, such as seawalls and levees, were not needed during the more benign 70s, 80s and early 90s and were allowed to deteriorate. Now these regions are at increased risk, with higher populations and inadequately maintained protection.

Remember – a “natural disaster” is usually the combination of a change in weather and inappropriate human action. We don't declare a disaster if a wetland is inundated in a hurricane but drain the wetland, throw up expensive houses, wait for the next storm and now you get a ‘disaster’.

As for those managing and insuring risk, it is vitally important for them to understand which disaster warnings have become less reliable and what the new levels of risk are.

Drought

One of the consequences of the hotter Atlantic waters is that it created hotter summers in North America. In the process, it created a greater risk of drought. Part of this is due to the hotter ocean temperatures

strengthening the equatorial trade winds, so that more tropical moisture blows into Mexico and less into the US interior. The other great cause of drought, however, is “flash droughts” such as we experienced in the summer of 2012.

A **flash drought** is when the main cause of drought is heat. The rainfall levels may be near normal or slightly below but the evaporation level is very high when the temperatures become very high. This summer the US experienced record-breaking heat in June and July and the evaporation rate in some portions of the Midwest was over half-an-inch per day. By August 60% of all US farms were in areas experiencing drought,

In the past, the main indication of drought was rainfall measurements. However, this has proven inadequate for warning societies in time to save their crops from flash droughts. By the time rainfall readings indicate a drought, the crops are dying.

However, scientists at the U.S. Department of Agriculture developed a way to harvest numbers from NASA and NOAA satellites and turn them into a map of plant stress. A **month** before rainfall measurements or other drought indicators picked it up, some satellite data maps showed what was coming for the American South and Midwest: hot, water-stressed crops that eventually died under a prolonged drought.

In a December 5 NASA press release scientists announced that these plant stress maps could help the U.S. predict and prepare for drought sooner. They serve as an early warning, alerting scientists just as the crops start to run out of water. According to a recently released NASA statement, these earlier predic-

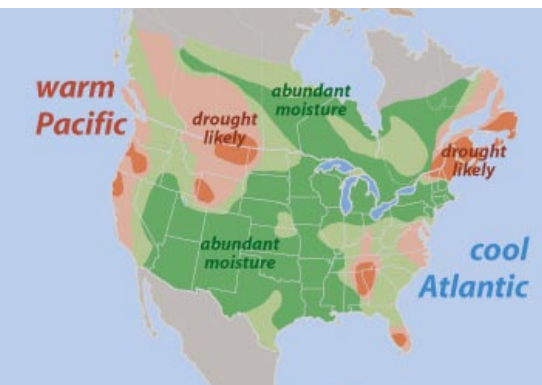
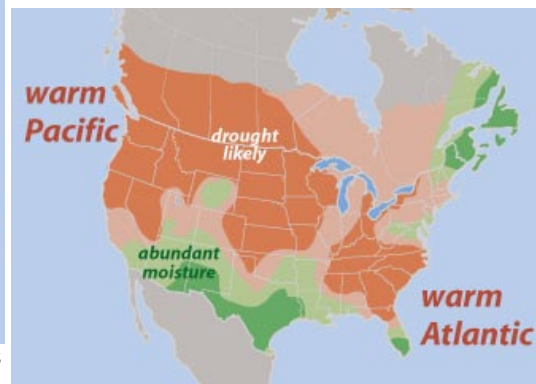
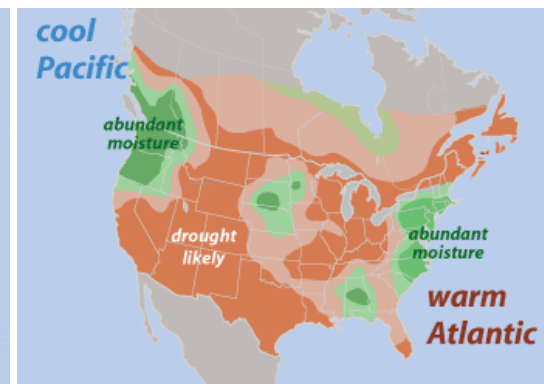


fig. 9 A From the mid 1970s to the late 1990s the US & Canada enjoyed the most benign combination of the PDO and AMO.



figs 9 B-C Since the Atlantic warmed in 1995, North America faces a greater risk of drought. US data: USGS ©Browning Newletter



Hidden Hurricanes

tions can allow farmers to buy extra feed for their animals or adjust any contracts they sign. Similarly, businesses that utilize or insure commodities make appropriate adjustments for reduced crop productivity.

These satellite maps have another advantage. They expand the coverage of areas where there are fewer water gauges. One of the developing problems was reduced repair and replacement for US water gauges over the past two decades, reducing the amount of data for large areas of the nation. By contrast, satellites are able to record the conditions of individual fields anywhere in the U.S.

It is important to realize that this is not just a US problem. The current negative phase of the PDO has pushed cooler waters off the west coast of South America and warmer waters around East Asia and Australia. The gradually heating Indian Ocean and its own Indian Ocean Dipole cycle have increased the risk of flash droughts for the Eastern Hemisphere. However, these areas are also viewed with plant stress satellites recorders. Using the current technology, available on the internet, agricultural concerns throughout the world can have access to early drought warnings.

The warmer waters of the Atlantic have also altered the nature of the Atlantic hurricane season. Hurricanes are heat engines, fueled by the energy of the hot ocean surface. The warmer Atlantic has provided more energy that:

- According to NOAA – doubled the number of tropical storms,
- Allowed the storms to drift further north, retaining more moisture and strength. Some storms have even remained tropical long enough to cross the Atlantic and hit Europe.
- **Energized the surface of storms near the ocean water, giving them tropical characteristics. This has produced “hidden hurricanes.”**

This last point has created a problem for the National Hurricane Center (NHC), the agency in charge of warning Americans of approaching tropical storms.

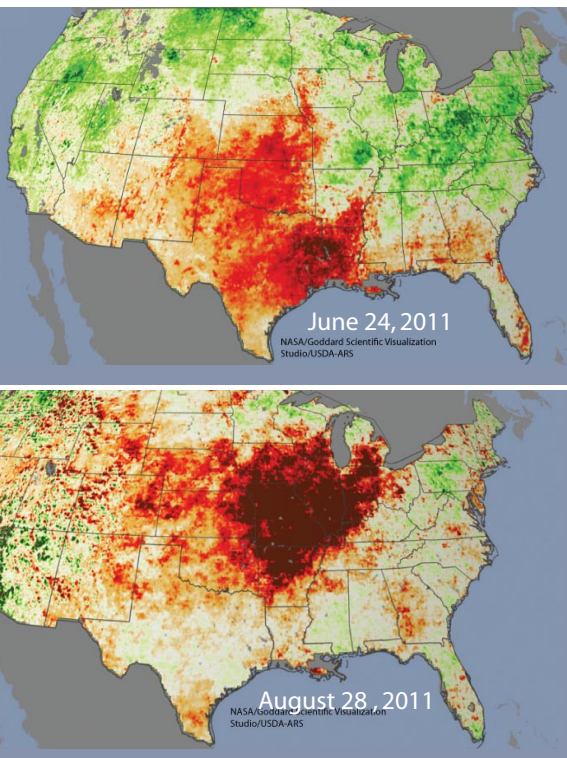
Tracking tropical cyclones is a constantly evolving science, and many of the accepted methods used in the cooler era of the Atlantic have to be modified in today’s stormier era. The agency has used satellite data since the launching of TIROS in 1960. However, the warmer waters now energize the bottom of some storms, giving them tropical characteristics, while the top areas observed by satellites appear non-tropical. These “hidden hurricanes” created some real problems.

The first problem was the increase of subtropical storms. Initially these storms, which form when an extratropical storm drifts over hot water and starts to become tropical from the bottom-up, were relatively uncommon. By 1972, the National Hurricane Center began to recognize them, since they sometimes evolved all the way into completely tropical storms or hurricanes. During the cool AMO era, subtropical storms were rare but as the Atlantic became warmer, they became

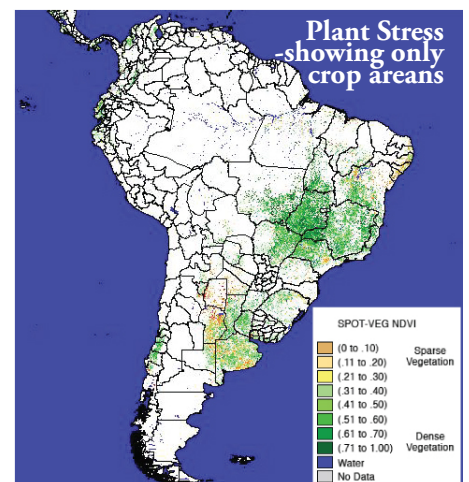
relatively common during the beginning and end of the yearly hurricane seasons.

Initially, since they were different types of storms, subtropical storms were named and/or numbered differently from tropical storms. Unfortunately, if one of these storms hit you, it felt like a tropical storm. People hit by these storms were not prepared for their intensity or damage. Finally, in 2002 – seven years after the Atlantic had warmed – the NHC began giving names to subtropical storms from the same sequence as tropical cyclones. This alerted people to the potential danger of the storm and increased preparation, saving lives and property.

A second problem remained and we saw it in the coverage of Hurricane Sandy. Hurricanes have a life cycle. They start as a tropical or subtropical depression, and



figs. 10 A-B Plant stress maps June 24, 2011 (top) and August 28, 2012
NASA/Goddard Scientific Visualization Studio/USDA-ARS
http://www.nasa.gov/topics/earth/features/plant-stress_prt.htm



figs.11 A-B Most South American crop areas have good moisture but soybeans in Northeast Brazil are struggling with drought
<http://www.pecad.fas.usda.gov/cropexplorer/continentView.cfm?fy=peid=4&fattributeid=1&stypei>

then as water warms and wind conditions improve they become tropical storms or hurricanes. When they drift over land and/or cooler waters, they lose their tropical characteristics and become extratropical storms. Sometimes, however, a tropical storm like 1991's "Perfect Storm" or Hurricane Sandy, is engulfed by a passing cold front. From a satellite's point of view, they become extratropical. However, if you are a hapless fishing boat or the Jersey Shore, they retain some of the dangerous characteristics of a tropical storm. Once again, a "Hidden Hurricane" hits populations without warning.

The NHC has always had the job of tracking tropical storms and hurricanes. Once the storms became extratropical, reporting became the responsibility of other agencies. As Hurricane Sandy became absorbed by a strong cold front, a huge debate arose within NOAA over which agency should handle the storm and warn local officials. In the end, the NHC handed over operations to the local National Weather Service agencies. It is felt by many that the failure to issue official NHC Hurricane Warnings north of North Carolina resulted in confusion prior to Sandy's arrival among the average public as to what sort of storm was heading their way. They were not prepared for hurricane force winds and life-threatening storm surges. The result was devastating.

Research by Florida State University Associate Professor Bob Hart reveals that Sandy remained a tropical system at landfall and through central Pennsylvania, in short – a "hidden hurricane." While the National Weather Service, as late as December 13 was announcing that "Sandy warnings were clear and effective", the agency has come under massive criticism. NOAA Administrator Jane Lubchenco announced that she will step down at the end of February 2013 (because she wants more family and academic time).

At this point, it appears that the NHC will modify or, in its own words "allow more flexibility" in reporting the track and warnings for post tropical storms in 2013. However, between the unknown impact of the potential Fiscal Cliff on NOAA's operating budget and controversy within the agency, it is not known what sort of new policies will be designed.

Meanwhile, as long as the Atlantic remains in its warm phase, hurricanes, hidden or otherwise, will remain a major threat to North American property and lives. As Hurricanes Katrina and Sandy have shown, current warning and protection systems are inadequate for current realities.

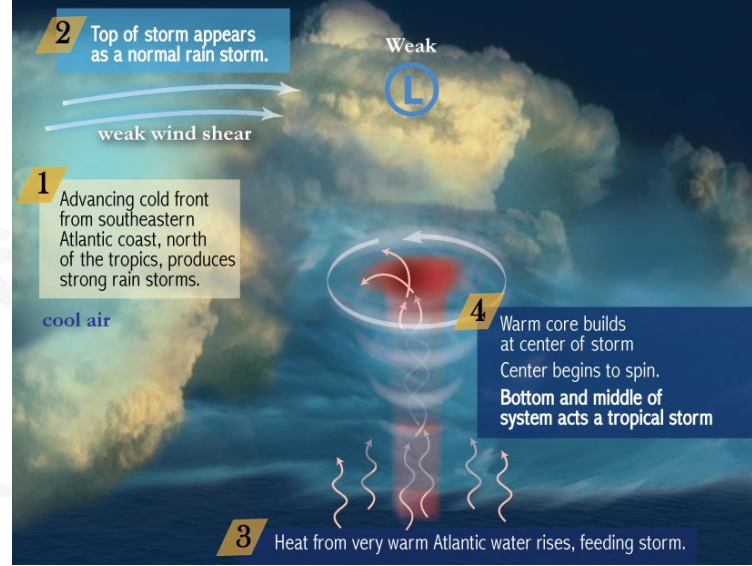
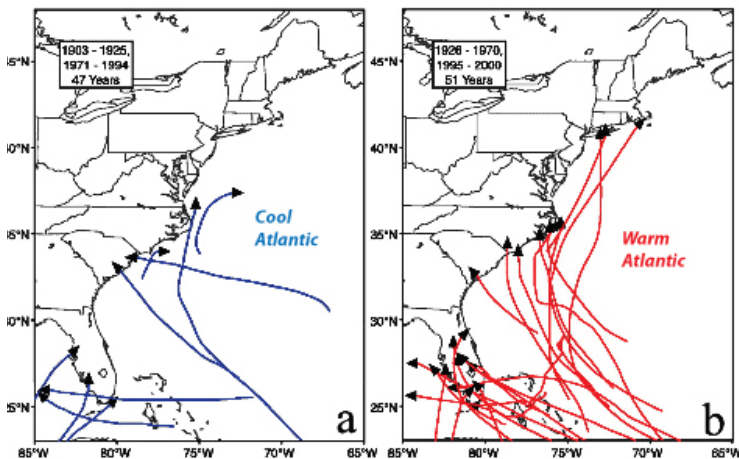


fig.12 A subtropical storm, with features of a hurricane lurking within © Browning Newsletter

El Niños and La Niñas

The impacts of droughts and hurricanes are local. The impacts of El Niños and La Niñas, the warming and cooling of giant areas of the tropical Pacific, are global. When millions of square miles in the Pacific are superheated during El Niños, the tropical atmosphere is heated. This alters moisture contents, air pressures and wind patterns. The impact of this alteration is felt globally. Similarly, the impact of La Niñas changes weather throughout the world.

These widespread patterns have been studied for centuries. The Inca and Spanish Conquistadors noted the impact of the events on South America and in the



figs.13 A-B Variation in landfalls of major hurricanes on the eastern United States during times of a) cold and b) warm phases of the Atlantic Multidecadal Oscillation.

http://ngom.usgs.gov/task3_1/index.php

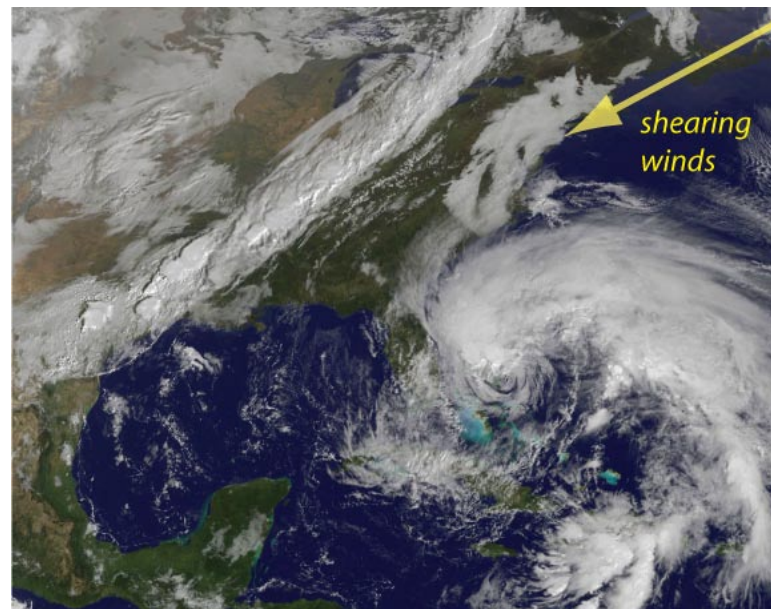


fig. 14 Sandy was absorbed by a cold front but remained a partly tropical system through New Jersey and central Pennsylvania

http://www1.nasa.gov/images/content/700874main_20121026_Sandy-GOES_full.jpg

nineteenth century the British discovered the impact on India. By the 1980s, scientists knew the global impact and began compiling sophisticated tracking systems that were excellent at projecting when the events would arrive. They had some difficulties when the ocean was neutral but were very good at trend spotting.

Unfortunately, El Niños and La Niños (the whole cycle of water and weather is called the El Niño/Southern Oscillation or ENSO) are not the only pattern in the vast Pacific. The PDO dominates the northern Pacific and modifies the impact of the ENSO on global weather. When the PDO is in its positive or warm phase, it enhances the impact of warm El Niños and minimizes the effects of a cool La Niña. Now the PDO is in its negative or cool phase and it is strengthening the extreme weather impacts of cool La Niñas. Warm El Niños have greater difficulty developing, are more frequently interrupted or shortened, and usually have a weakened impact on global weather, especially in the northern latitudes.

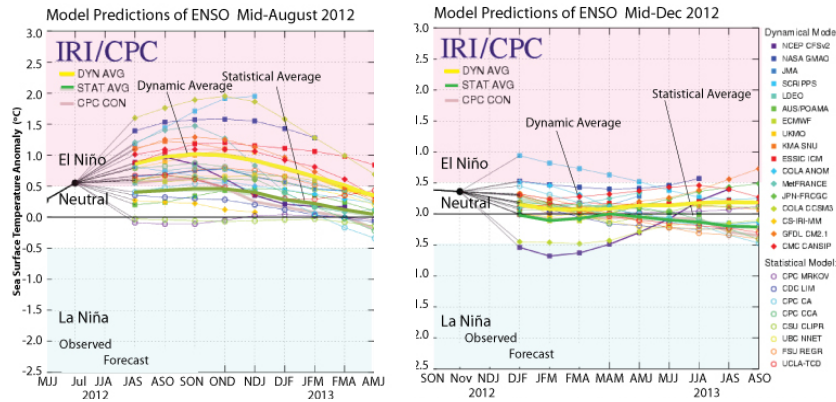
Just compare the range of predictions from the major scientific centers in mid-August (fig. 15A) with the current predictions (fig. 15B). Back in August, the tropical Pacific was actually experiencing weak El Niño conditions and weather, which helped bring enough August rainfall to salvage some of the US soybean crop. The consensus of dynamic models, which recently had the best tracking record, projected a moderate El Niño this winter. Now the majority of both dynamic and statistical models are equally divided on what the tropical Pacific conditions will be this winter (indeed the largest number expect a cool La Niña!) and the majority expect neutral conditions for spring and summer.

In short, a warning system that was designed in the era of a warm PDO is having problems coping with the new conditions of a cool PDO. What I have observed is that the system tends to be better at projecting cool La Niñas and has more problems anticipating warm El Niños. However, it is

La Niñas like we had in 2007 – 2008 and 2010 – early 2012 that have the most negative impact on global crops, particularly crops in the US, Argentina, and southern China. The system, in other words, can be a useful warning for the most dangerous portion of the ENSO for US crops but is currently not terribly reliable for forecasting the benign El Niño.

These warning systems, which incorporate recent trends in their statistics, are still adjusting to the change in the Pacific and its effect on ENSO weather patterns. Since we are early in the cool PDO phase, the adjustments are not yet completely accurate. When one looks at predicted weather in the US and Canada, the impacts of La Niñas, particularly the severity of the droughts they bring, tend to be underestimated. Meanwhile the effects of El Niños are frequently overestimated, particularly the warming impact on northern states.

As noted in the first article, the El Niño conditions of last summer never lasted long enough to be classified as an official event. They did affect weather conditions, but then their impact receded and the US never received enough rainfall to reduce the drought. The current rainfall for the southern tier of states is more determined by the transitory MJOs, which vary in strength and the number of weeks they affect an area.



figs. 15 A-B
El Niño projections are less reliable. The El Niño event projected in August never occurred.
August (left) and December 2012
courtesy: IRI

Fortunately, one can keep track of MJOs. Their current position is breaking any dry spell in Indonesia and creating dry weather in Northeast Brazil. They are bringing moisture to southern Brazil and Argentina and encouraging storms in the southern US.

Conclusions

With the changes in both the Atlantic and Pacific Oceans, there has been a change in the reliability of the global warning systems. The warnings for ENSO changes and hurricane damage have become less reliable, although agencies are responding and may show some improvements, particularly with tropical storm impacts, in the next two years. Meanwhile the warnings for droughts and their potential for crop damage have shown remarkable improvements.

This does not mean that insurance companies, risk managers and societies in general will be facing a near future of less extreme weather. However, there are warnings and knowing which warnings are reliable is the first step to intelligent management.

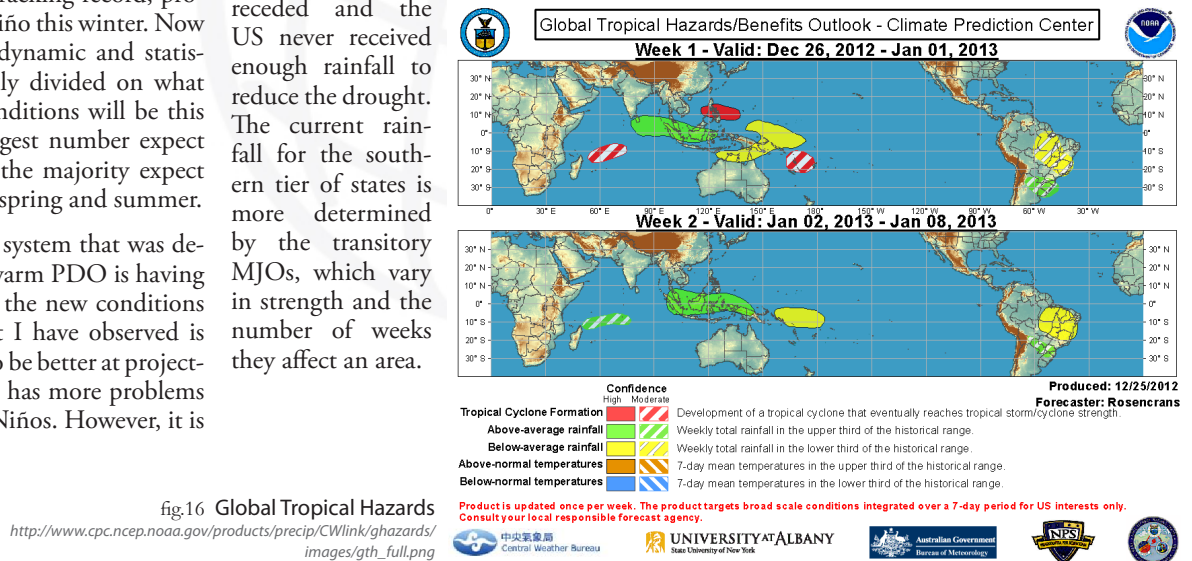


fig.16 Global Tropical Hazards
http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ghazards/images/gth_full.png

News Notes



Shipping conditions in the Mississippi River are in danger of stopping. Ice on the northern Mississippi River is reducing the flow to the middle part of the river, which is already at the lowest level in decades due to drought. Officials with two trade groups -- the American Waterways Operators and Waterways Council Inc. -- warned that river commerce could essentially come to a halt as early as the first week in January in an area south of St. Louis. The Coast Guard remains confident that the nation's largest waterway will remain open. However, the long-range forecast from the National Weather Service calls for the river to keep falling, to a depth of only 2 feet in some areas by Jan. 23.

Experts say that if barges stop moving, the potential impact on shipments of essentials such as corn, grain, coal and petroleum could reach into the billions of dollars. The problem could be averted if the Army Corps of Engineers moves to increase the flow of water from the equally drought-stricken Missouri River to the Mississippi, but at the moment that appears very unlikely.



It may be dry in the US but conditions are very different across the Atlantic. The United Kingdom started 2012 with a drought and heat wave in March, but since April they have experienced record-breaking rains and floods. At press time, there were 88 warnings and about 225 alerts in force in England and Wales, with 21 alerts and warnings in Scotland. Experts say that it is probable that 2012 will be the wettest year in the UK since records began in 1910. Current estimates are that the insurance losses from flooding for the year could reach £1.33 billion (\$US2.15).

The timing of the floods have been awkward, coming in the wake of the government's 2010 cuts to flood protection. Additionally the Government and the UK insurance industry are re-negotiating a deal to provide affordable insurance to flood prone homes. The current subsidy is due to expire in 2013.



The hurricane season is over in the Atlantic, but typhoons and cyclones are still active in other portions of the world. More than 20 serious tropical storms hit the Philippines every year, but on December 4, it was hit by an unusually late storm, Typhoon Bopha. The storm took an unusual path, striking remote inland communities not accustomed to such strong storms. The residents ignored storm warnings, since they had never been hit by a typhoon

in living memory. The result was catastrophic. Widespread floods and landslides wiped out entire villages.

At least 890 people are missing while 714 were confirmed killed and more 1900 were injured. More than 5.4 million people were affected by the typhoon. Bopha damaged infrastructure and agriculture worth more than 7.11 billion pesos (about \$172 million), including more than 70,000 homes. Areas in the path of the typhoon that heeded the warnings moved to high ground and not a single life was lost.



A team of Australian and Chinese researchers has made an alarming discovery in the waters near China – the giant coral reefs once found off shore have shrunk by an astonishing 80% over the last 30 years. Biological surveys in the South China Sea and off mainland China by the Australian Research Council Centre of Excellence for Coral Reef Studies and the South China Sea Institute of Oceanology revealed a massive die-off in the region that has accelerated in the past 10 to 15 years. The reef once stretched roughly 12,000 square miles (31,000 square kilometers) but has fallen victim to temperature change, pollution, overfishing and coastal development. In addition to environmental causes, regional politics also plays a part in the reefs' destruction, the AFP reports. Several countries in the area, including Malaysia, the Philippines and Vietnam, have competing claims on territorial waters in South Asia, making management of the area's resources difficult.



According to most solar scientists, the peak of the solar cycle should be next year. But is it? Barely-increasing sunspot counts and anemic solar activity suggest an interesting possibility: perhaps the cycle already peaked. Scientists expected this cycle, Solar Cycle 24 to be the quietest in forty to fifty years, but so far, it is underperforming even compared to the panel's low expectations.

There is still a strong chance that Cycle 24 will rebound and peak in 2013 as expected. It might even be a double-peaked cycle like the cycle before it. As 2013 nears only one thing is certain: we don't know what will happen.

The solar radiation is part of the system determining global temperatures. One low cycle would not stop global warming but if it is followed, as most scientists expect, by an even quieter Solar Cycle 25, it could have a measurable impact.

The **BROWNING**
NEWSLETTER

is published by

Fraser
Management
Associates

a Registered Investment Advisor

For more information or an
informational brochure

call 1.802.658.0322

or e-mail us at alex@fraser.com

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.

PREMIER EDITION

Need more in-depth information and analysis? We offer a Premier Edition.

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

www.BrowningNewsletter.com

Browning Newsletter
January 2013
page 8

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

The BROWNING NEWSLETTER
PO Box 1777
Burlington, VT 05402

1-802-658-0322
kelly@browningnewsletter.com