

A FRASER MANAGEMENT PUBLICATION EL NIÑO TO THE RESCUE?

INTHIS ISSUE

- El Niño is developing rapidly and will probably start in August. Parts of the Tropical Pacific are already as warm as an event with moderate strength.
- The event is too late to save the corn crop but may soon add needed moisture for the soybean crop.
- The El Niño arriving this early will help suppress the Atlantic Hurricane Season and steer most storms away from the western Gulf of Mexico oil patch.
- The impact of this summer's heatwave and drought is hitting a number of economic sectors besides agriculture and food prices. Electrical production, ethanol, hydrofracking, river transportation, infrastructure and even retail sales are affected.
- The developing El Niño is having a negative impact on India and northern Brazil. It is also affecting Northern China and Indonesia, but the negative Indian Ocean Dipole mutes the impacts.

- SUMMARY

It is probable that the El Niño will develop in August. This will be too late to rescue the US corn crop, but it will soon provide some relief for soybeans. It also is probable that this development will strongly reduce the risk of tropical storms in the Gulf of Mexico oil patch.

North America is baking. Soaring temperatures broke more than 7,495 US high temperature records this summer. The results of this heat wave have been paradoxical –severe drought and recordbreaking storms.

Drought and Storms

As temperatures rise, so do evaporation rates. The United States is currently suffering its worst drought since 1956. By the last week of July, more than 80% of the continental US was dry or officially in drought. This was a twenty percent increase over the drought conditions three months ago, when the two-year La Niña finally faded. An estimated 63.9% of the continental US was officially suffering drought conditions and 20.6% was in extreme drought.

Unfortunately, the worst of the drought



is concentrated in the US agricultural heartland, the Midwest and the Great Plains. By mid-July, the USDA announced that 88% of the nation's corn and 87% of soybeans were in drought-stricken areas, and that conditions were the worst for farmers since 1988. By July 26, 1,369 counties in 31 states, 44% of those in the entire country, were declared natural-disaster areas. This makes them

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





http://www4.agr.gc.ca/DW-GS/current-actuelles.jspx?lang=eng&jsEnabled=true

eligible to receive low-interest loans and other assistance from the federal government.

It is already too late for corn and we are seeing this reflected by the commodity's rising prices. The US corn crop was planted early, thanks to an unusually warm spring, and entered its most vulnerable stage, silking and pollination, during the peak of the heat. In the eastern portions of the Corn Belt there were substantial areas abandoned. As for the remaining fields, stress during the pollination and silking stage results in shorter ears, increased tip back and fewer kernels per ear. This can reduce the yield potential by 40 – 50%. Even if good rains return and plump out the kernels, there are fewer kernels per cob. By July 10, the USDA dropped its once record-breaking estimates of US corn crop yield by 35%. Two weeks later, Newedge USA LLC, the third-largest U.S. futures brokerage, cut its estimate for the nation's corn production to 13% below the USDA estimate. Only 26 percent of the crop was in good-to-excellent condition as of July 22, the worst rating for this time of the year since 1988 when output plunged 31%.

At the same time that farms are devastated by drought, urban areas are blasted by storms. Over the four weeks since June 29, 2012, the US has been swept a series of severe wind events associated with powerful thunderstorms, known as derechos, (Spanish: straight), or "land hurricanes".

Extreme heat provides extreme energy for developing storms. When cool air hits this superheated air mass, it is like a car crash! The collision generates severe storms that can sweep hundreds of miles in mere hours while generating hurricane force winds. Worse yet, unlike real hurricanes, there is little to no warning, so there is almost no preparation. As a result,

these storms can inflict more damage than actual tropical storms, especially on vulnerable electrical grids. So far, the summer has had four derechos.

- The series began on June 29, when a volcanically cooled air mass hit the upper edge of the Midwestern heatwave. The resulting derecho ripped from Iowa, through the Midwest and finally blasted the Mid-Atlantic from Pennsylvania to North Carolina, sweeping roughly 700 miles in twelve hours. Its 91 mph (146 kph) winds and severe storms killed 22 and cut power to nearly 5 million people.
- On July 2, a much less long-lived derecho tracked due south from Kentucky through Tennessee over about a 300 Mile track. The derecho was about as wide as its track was long.
- After a three-week quiet spell, a very

US Corn Areas Experiencing Drought July 10, 2012



fig. 3 http://blogs.usda.gov/2012/07/12/agricultural-weather-and-drought-update-%E2%80%93-71212/

small derecho tracked from Chicago through Indiana, western Ohio, and down into Kentucky on July 24.

• Just two days later, a fourth derecho struck much of the eastern US on July 26. The derecho started over Lake Erie and made landfall near Cleveland. It then expanded rapidly across the northeast and Midwest, affecting west-central Ohio for the third and final time in the 4 weeks following June 29.

Both the heatwave and the frequency of severe storms were unusual. Will this unusual weather continue?

Will El Niño Rescue August?

Part of the reason that this weather is so unusual is that we are transitioning from a two-year-long La Niña to an El Niño. Normally, it takes a more than a year to make the transition. Currently we are shifting from one global weather extreme to another in a mere four to five months. It is the equivalent of weather whiplash. There has been no time for North America to recover from the droughts created by La Niña before we see more drought created by El Niño.

At this point, the majority of international climate services agree that an El Niño will develop this year and most expect the event to begin in the July-August-September period. Satellite measurements show that the entire Tropical Pacific, from 150° W to the coast of South America is experiencing temperatures warm enough for an El Niño. The areas east of 135°W are warm enough to be a moderate event. Only

a shrinking area around the International Dateline is not yet hot enough to qualify as El Niño. What this means is that while the event has not yet officially started, there is already a huge amount of hot water distorting normal weather patterns.

To understand how El Niños develop, it is necessary



fig. 4 Records show that 4 derechos in four weeks is very rare http://www.spc.noaa.gov/misc/AbtDerechos/derechofacts.htm

to understand that the tropical trade winds vary in strength. When they are stronger, they ruffle the surface of the ocean and the surface grows colder. When they are weaker, the surface stills and is warmed by the sun. This pattern is called the Madden Julian Oscillation (MJO). This pulse of first stronger, then weaker winds shifts eastward around the equator. Typically, the pattern lingers in area between four to eight weeks. We saw the winds weaken in March and April and the cool tropical La Niña vanished. Starting in late July, we saw even weaker winds and the tropical waters are warming. Given that this type of pattern typically lingers for weeks, it is very probable that the warming will continue and El Niño conditions should dominate the tropics by mid-August. Officially, there is only a 50 - 60% probability of this happening, but the models that are most accurate expect the event to start next month.

Here at the Browning Newsletter, we estimate an 80% chance of El Niño conditions in August. The conditions will officially be a weak El Niño at that time because the overall area will be between 0.5° -1.0°C (0.9° - 1.8°F) above normal, but the waters in the Eastern Pacific, which have the greatest impact on North American weather, will be as hot as a moderate El Niño, which will increase their impact.

Typically, El Niños that start in August create cooler temperatures in the most of the Midwest. At the same time, they increase warmth in the southern tier of states and portions of the Pacific Northwest. The High Plains and most of the East get good rains, but unfortunately, they bring drier conditions for the Upper Midwest and Texas. (The one good bit of news is that most of the Texas dry weather is later in autumn and is the result of tropical storms being steered away from the Western Gulf.)

This is good but not great news for soybeans. The crucial month for soybean development is August, and conditions will be better in the southern and western Midwest growing regions, as well as the Eastern Canadian croplands. The northern areas may still encounter some problems. The earlier these northern soybeans are planted, the more likely they will be to get timely rain relief.

What is bad for farmers is excellent for the Gulf of Mexico gas and oil industry. The El Niño tends to steer tropical winds, and moisture, toward the Northeast. We saw this trend as the phenomenon developed. It steered Gulf moisture away from the Midwest, toward the Mid-Atlantic. It also, historically, suppressed Atlantic hurricane development and tended to guide most tropical storms away from the Western and Central Gulf oil and gas region. To have an El Niño develop in August, before the peak of the Atlantic Hurricane season, would reduce the number of hurricanes and give the Gulf energy industry a much quieter season.

From Summer to Fall

An El Niño, with over a million kilometers of warmer waters, is the single largest force shaping the remaining weeks of summer in the Northern Hemisphere. It is not, unfortunately for the Midwest, the only factor. The steamy Atlantic Ocean will also influence the weather.

El Niño Temperature Anomalies (°C) 19 cases





- 1 The sun is entering the active phase of the solar cycle.
- 2 The large eruption of Grímsvôtn has distorted Arctic winds.
- 3 Large volcanic eruptions put climate-changing debris in the stratosphere in 2009 and 2011.
- 4 The Pacific volcanoes have been very active with many small and medium-sized eruptions.
- 5 The neutral Pacific is rapidly evolving towards El Niño conditions.
- 6 The Gulf Stream is flowing fast and the North Atlantic is very warm.
- 7 The Indian Ocean Dipole is weakly negative.
- 8 Cool water off the West Coast, warmer off of East Asia.

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9 Warm Arctic water.



figs 6-7 August, September and October El Niño effects

top http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/ composites/elnino.aso.precip.gif bottom http://www.cpc.ncep.noaa.gov/ products/precip/CWlink/ENSO/composites/elnino.aso.temp.gif

Departure from Normal Precipitation (in) July 1-29, 2012



http://www.hprcc.unl.edu/products/maps/acis/MonthPDeptUS.png

The Atlantic is in a long-term warming trend, scientifically known as the warm phase of the Atlantic Multidecadal Oscillation. This means the Gulf Stream and other tropical currents are unusually strong and fast as they carry hot equatorial waters north. The the flow was so rapid that the waters surrounding North America in May 2012 were as warm as they normally are in July. However, this rapid flow also brought some of the cooler waters from the South Atlantic north, so that waters directly off the US coasts from Texas to North Carolina are near normal. Further north and in the Great Lakes, however, the waters are between 0.5° to 4.5°C (0.9° – 8.1°F) above normal. Much of the heat generated by these waters is continuing to heat the US and Eastern Canada. Expect this warming effect to continue for another month or two.

Meanwhile, the Arctic air masses (still carrying volcanic debris) that will arrive with increasing frequency from the northwest as autumn settles in, will continue to generate strong storms.

It has been a very long time since we have seen similar weather. For a number of years, I warned clients that the last time we saw some of the current conditions was in the 1940s and 50s. Indeed, the present heatwave is the hottest since 1956. When we examine the most similar years to this year, we saw the following weather patterns 60 - 80% of the time – see figures 9 - 11.

Remember, large volcano eruptions are the wild card in any forecast. After almost 5 weeks of relative quiet, Mt. Sheveluch on Russia's Kamchatka Peninsula appears to have erupted with an ash plume that rose 10 km (6.2 miles) high. This was not strong enough to alter climate but it is strong enough to affect the next passing cold front, adding more aerosols to collect moisture. Typically, we see a hard rain in the Midwest 10 - 14 days after an eruption this size. This would be very timely for soybeans.

Overall, it has been a terrible, horrible, no-good, very bad summer. The good news is that it is almost over and, with an El Niño, the worst of the heat and drought should ease.

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



figs. 9-11 *, Moderate eruptions in the North Pacific will bring more moisture to the west. © Browning Newsletter

THE ECONOMIC IMPACT OF DROUGHT

SUMMARY

The impact of this summer's heat wave and drought is hitting a number of economic sectors besides agriculture and food prices. Electrical production, ethanol, hydrofracking, river transportation, infrastructure and even retail sales are affected.

The US and global economy will feel the impact of this summer's drought for the rest of 2012. While most articles focus on how the current climate affects food prices, the effects will be widely felt in a range of economic sectors. Here in the US economy, we can expect the following: **FOOD PRICES** – The drought caused a roughly 42% rise in the price of corn since June. These price increases are already hitting the livestock industry. Overall the USDA predicts that the price of food for US consumers is expected to rise 2.5 - 3.5% this year and milk, egg and meat prices to increase by 3% - 4%in 2013. Beef prices are projected to rise 5%. Observers noted that inflation fears tend to raise prices and federal officials may be trying to keep these expectations contained.

FEDERALLY BACKED CROP IN-SURANCE WILL MAKE RECORD

PAYMENTS – According to Agriculture Secretary Tom Vilsack, an estimated 85% of farmers have crop insurance. With 88% of the US corn crop and 87% of the soybean crop in drought-stricken areas, there will be massive payouts this year. The insurance payments are linked to the price of crops at harvest time, and indications are that commodity prices will be high. This means that, despite drought losses, most US corn and soybean farmers will be in business next year. It also means that, as the publically/privately financed program



fig. 2 **The Derecho of June 29** http://www.spc.noaa.gov/misc/AbtDerechos/casepages/jun292012page.htm

intended, the insurance is replacing the need for government disaster payments.

INCREASED ENERGY DEMAND FOR COOLING – The Midwest, Northeast and Eastern Canada saw temperatures in the 90° – 100°F (32° – 37°C) range, rising to 5° to 8°F above normal. The area includes most of North America's major cities, including Chicago, Toronto, New York and Washington. In the words of David Salmon, owner of Weather Derivatives in Belton, Missouri, these temperatures made "...people use 30 – 60% more energy to cool down from Colorado to the Atlantic."

This electrical demand causes spot energy prices to rise as utilities try to meet demand. It also affects the prices for natural gas, which accounts for about 32% of the fuel used to make power in the U.S. A further problem from high demand occurred during the 2006 heatwave when the stress from increased demand damaged and destroyed several power transformers, causing widespread power outages.

HIGHER ETHANOL PRICES - The ethanol sector consumes about 40% of U.S. corn output. The Renewable Fuel Standard, a congressional mandate, requires more than 13bn gallons of cornbased ethanol be used in transport this year, regardless of the corn price. Not surprisingly, by July 11, ethanol increased to its highest price in more than seven months as corn losses boosted costs for distillers. At the same time, ethanol production is waning as skyrocketing corn prices, as weak gasoline demand and the expiry of subsidies hurt margins. So far, petitioners seeking EPA waivers have been uniformly denied. Currently there is a great deal of ethanol in storage and a number of regulatory technicalities that oil companies may be able to use. Nevertheless, in upcoming months, the price of ethanol is expected to rise with the potential to adversely affect the price of gasoline.

STORM DAM-AGE TO POWER GRIDS – As noted in the first article, we saw four derechos, which seldom occur more than once a year, hit in a single

four-week period. The first storm in the series, on June 29, did more damage than last year's Hurricane Irene, leaving thousands without power for up to a week. Unlike tropical storms, utilities receive little to no warning. Expect utilities to continue to incur increased expenses as demand and storms strain their systems.

LESS WATER FOR ELECTRICAL

PRODUCTION – Thermoelectric power plants account for 80% of electric generating capacity in the United States. Thermoelectric plants use heat from raw materials, including coal, oil, natural gas, nuclear, and biomass, to convert purified water into steam. This steam then spins a turbine connected to a generator to produce electricity. These facilities are the second largest water user in the United States, accounting for 39% of all freshwater withdrawals, just behind irrigation, which accounts for 41%.

History shows us that limited water supplies and heat waves have curtailed thermoelectric power production in many regions. As noted by the New York Times, "During the 2008 drought in the Southeast, power plants were within days or weeks of shutting down because of limited water supplies. The multiyear drought in the West lowered the snowpack and water levels behind dams, reducing their power output. The United States Energy Information Administration recently issued an alert that the drought was likely to exacerbate challenges to California's electric power market this summer, with higher risks

of reliability problems and scarcity-driven price increases."

Another 7.1% of US electrical production comes from hydroelectricity, which is even more dependent on water supplies. These facilities are especially vulnerable to drought and generators outside of the Pacific Northwest are facing reduced water reserves.. Studies by the US Department of Energy show that during severe droughts, the electrical generation from hydroelectric can drop by almost 30%.

LESS WATER FOR GAS DRILLING -

It worth noting that hydraulic fracturing is yielding new reserves of gas, but the process is water intensive. Many of the most promising sites are in regions that are currently plagued with drought.

In Texas today, some cities are forbidding the use of municipal water for hydraulic fracturing. Further, east, the Susquehanna River Basin Commission suspended permits to siphon water from the river's streams in the highest number of areas than at any time since it began issuing permits. This action affects 30 companies, including natural gas drillers, that rely on some 64 water withdrawal areas in 13 Pennsylvania counties and one New York county.

LESS WATER FOR RIVER TRANS-

PORTATION – As Figure 13 shows, the 2012 drought is affecting water levels on the Mississippi River. Shippers are forced to break up tows as levels drop, raising rates in some areas up 55% of tariff. Mostly these price hikes affect grain, but some areas, such as Kentucky, heavily



fig. 13 Low stream flows are hampering river transportation and hydroelectricity http://waterwatch.usgs.gov/?id=ww_current

depend on river transportation for coal. Similarly, coal slurry operations are vulnerable to water shortages. Both forms of transportation are affected by the current drought.

HEATWAVE DAMAGE TO LOCAL

INFRASTRUCTURE – As the heatwave of 2006 demonstrated, heatwaves cause ruptured water lines and buckled roads. This year we saw roads from Fargo, N.D., to Chicago and Cary, N.C., heat up under triple-digit temperatures. This draws moisture from underneath to the surface and creating what's called a "heave." This heave process is equally damaging to the roads and the pipes under the surface. Counties and municipalities are facing increased infrastructure costs at a time when their lower tax revenues are making such repairs difficult to impossible.

WILDFIRE RISK – The drought not only created a spectacular wildfire season, but it weakened entire forests, leaving them open to massive insect infestations. According to Robert Zubrin, a senior fellow at the Center for Security Policy, the prolonged outbreak of Western Pine Beetles left "60 million acres of formerly evergreen pine forests into dead red tinder, dry ammunition" for future fires.

RETAIL – – Historically, increased spending for food and electricity reduces discretionary spending. Additionally abnormal heat alters buying patterns, usually helping spring sales and hurting summer sales. (There are no US studies, but a Chinese study indicates a rise in on-line shopping during heatwaves.) Only a few businesses historically bucked the trend, particularly take-out food, water parks and beachside/lakeside recreation.



fig. 14 Heavily water dependent hydraulic fracking will be adversely affected by the recent drought. http://www.slb.com/services/industry_challenges/--/media/Files/industry_challenges/unconv tional_gas/other/shale_plays_lower_48.ashx



fig. 15 Wildfire brings both economic and ecological risk. http://www.fs.fed.us/land/wfas/fd_class.png

INTERNATIONAL OVERVIEW

were creating some equally global extreme

🛏 SUMMARY

The developing El Niño is having a negative effect on India, Northern Brazil and, to a lesser extent, quality issues in the Chinese crop. It will have a positive effect on replenishing China's rivers and the upcoming Southern Brazilian and Argentinean crops. Meanwhile, the currents of the Mediterranean did carry heat to the east, affecting Balkan temperatures and Ukrainian and Russian crops

Last month the Browning Newsletter expressed concern for crop production throughout key agricultural regions throughout the Northern Hemisphere. The extreme heating of all three major oceans, the Pacific, the Atlantic and the Indian

Let's review some of the conditions affecting developing key crop areas.

heat and precipitation patterns.

India -- two major factors largely shape Asian weather by, the changes in the Pacific and the Indian Ocean. Currently the Tropical Pacific is whipping from La Niña to El Niño in four to five months. Meanwhile, in the Indian Ocean, a pattern called the Indian Ocean Dipole (IOD) is switching the warmer water to the east. The July Newsletter warned,

"The impact of the El Niño conditions are particularly severe on India, because the El Niño precipitation patterns are being reinforced by the wind patterns in the Indian Ocean caused by the current negative Indian Ocean Dipole. While the IOD might mitigate the impact of the El Niño drought in Northern China, they reinforce drought in India. The last time a line-up of a Negative IOD and an El Niño current was in 2009, a terrible year for India's monsoon."

Unfortunately, India's crucial June-September monsoon rains were 29 percent below average in the first month of the season, while the rains were about 15 percent below average in July. The combination produced, according to Farm Secretary Ashish Bahuguna, a probably 21 – 22% monsoon shortfall by the end of July. Reservoirs in eastern regions of the nation are down to 24% of their capacity. Expect lower grain, sugar cane, oilseed and pulse (bean) production. The government has launched contingency plans that are prioritizing drinking water from low-level reservoirs.

As noted in the second article, not all effects of drought are confined to the agricultural sector. On July 30th India suffered a massive power outage in its northern power grid. The blackout left 370 million people without power, as many people as the combined population of the US and Canada. The following day, a second blackout hit both the northern and northeastern grids and left 670 people powerless. The failed monsoon had a triple effect – higher temperatures due to less cooling rainfall, more demand for irrigation and cooling, and less water for hydroelectricity and thermoelectricity.

Indian officials are concerned about the potential impact of the drought on the national economy. Fortunately, India has an adequate stockpile of grain stocks, but there are inflationary concerns for pulses, oilseeds and perishables. Problems with high rural unemployment and reliable power are adding to the nation's concerns. Regrettably, with the El Niño strengthening and the IOD remaining negative, India's monsoon will continue to be weak, causing severe problems to western and northwestern India as well as Pakistan.

As noted above, "the IOD has mitigated the impact of the El Niño drought in Northern China." Additionally July's Newsletters wrote, "...the El Niño conditions have strengthened the South China Sea monsoon." We saw this monsoon produce very strong winds and penetrate deeply through the countryside. The good news is that the three-year drought in Southwest China, including the headwa-



 ${\rm fig}\ 16$ The Indian monsoon arrived late and weak in the West and Northwest

http://www.imd.gov.in/section/nhac/dynamic/Monsoon_frame.htm

ters for the nation's central and southern rivers, was partially alleviated by a number of flooding rainfalls. The bad news for Chinese farmers is that the high temperatures and heavy rains hurt production and significantly increased disease for much of the nation's corn crop.

Skilled China watchers observe that the current return of previous grain purchases and the official pronouncements of China's "eighth consecutive year" of "record" production are moves that are probably aimed at lowering future purchase prices. The flooding to northern areas should ebb, but southern areas will continue to see above average summer rainfall. Expect the abnormal weather to increase crop concerns, especially disease and quality concerns.

Similarly, the negative IOD limited the impact of the developing El Niño. The El Niño normally brings drought, but this year's dry season began later than normal. By the end of July, however, the effects of the drought are visible through rice-producing East Java.

Moving to the fast-flowing Atlantic waters, they affect crops in Europe. Last month, the Newsletter warned that the flow "means two things for Europe – Saharan heat will surge over Mediterranean countries this summer and the prevailing wind patterns will shift the majority of this heat eastward toward the Balkans, and the important grain production lands of Southern Russia and the Ukraine." We saw the heat and, it shifted to the east.

When Russia's hot, dry early summer was added to last year's planting problems, the results have been bad for agriculture. The Russian Agriculture Ministry announced that grain yields this year are 34% lower than a year ago. This includes lower winter and spring wheat yields as well as barley crops. Similarly, sunflower production, Russia's main oilseed crop, is expected to see a 20& drop in the Volga region and a 5% drop nationwide.

The Ukraine has also had a hot summer but the heat was timelier. The corn crop is still, according to the USDA, in excellent shape and should yield a million more tons than last year. Fortunately, for the Ukraine, they did not plant early, so the worst heat came and went before the crucial pollination and silking stage. On the other hand, the overall dry conditions during the winter rapeseed (canola) planting interfered with germination and large portions of the Ukrainian canola crop were abandoned.

Historically, the impact of developing El Niños is muted in Europe. This is not so in South America or Australia. Both continents are smaller, Pacific Rim continents and El Niños can dominate their weather. Indeed, since El Niños usually peak in December and January, the phenomenon tends to have a bigger impact on their economies than it does in most Northern Hemisphere countries.

In Australia, the El Niño normally brings hot, dry weather. The negative Indian Ocean Dipole usually buffers the continent from feeling the full impact, so expect dry, not "Big Dry" weather. One of the biggest risks is wildfires, since the previous two years of La Niña were wet and the abundant brush will dry out and become fuel. Eucalyptus trees and wildfires – it's not a pretty combination.

For South America, El Niños have mixed effects. The events typically cause drought in the northern part of the continent and abundant rain in southern regions. This is



fig. 18 **China's precipitation anomalies** July 11-21 http://www.pecad.fas.usda.gov/cropexplorer/imageview.cfm?regionid=che

bad news for Brazilian sugar cane but great planting during the southern spring months news for Brazilian and Argentinean corn and soybeans. Expect the southern farming areas to have normal to above average moisture for

of September, October and November.

The overall outlook is for continued stress for Northern Hemisphere crops but an improved position for South American crops.

The heavy rains that drenched North China have flooded North Korea. Flooding has left large swathes of land submerged, leaving 88 dead, injured 134, almost 63,000 people homeless and destroying more than 30,000 hectares (74,131 acres) of crops. This is following prolonged drought. This presents a formidable challenge to a nation that was estimated to need food for three million people before the drought and flood. It is also a challenge for the nation's young leader who is still establishing his control over the bellicose nation.

Just in case this summer has not brought enough problems, scientists are reporting a massive increase in insects. Thanks to a warm winter that didn't kill the bugs and a warm March that allowed them to begin to breed early, the insect population is literally swarming. In the rural Heartland, this means more crop damaging insects and, in some cases, less familiar infestations as insects move farther north or move from severely drought damaged crops, like corn, to heartier crops like alfalfa. In cities - it means more vermin. According to a survey by Orkin, Cincinnati, Ohio had the worst bed bug problem with Chicago living up to its name as "Second City". Meanwhile, New York City is reporting a soaring black widow spider population. Ick!

It's not often that Greenland can make the news, but it blasted the news this month. NASA has announced a surprising finding – 97% of the surface of the Greenland glacier melted! This is the greatest area ever recorded in the 33 years of satellite imagery. The surface normally has some melting each summer and on July 8, satellite imagery showed about 40% of Greenland's top ice layer had thawed. Just four days later, 97 percent of the ice had thawed. During the same general period, Petermann Glacier lost a major chunk of ice creating an iceberg twice the size of Manhattan.

Like many climate occurrences, the events immediately set up a

News Notes

climate debate. Some have credited man-made global warming. Goddard glaciologist Lora Koenig noted that we have thousands of years of Greenland glacier records and this type of melt routinely occurs, on average, every 150 years. The last time it happened was 1889, so we are on schedule. (The event was called "unprecedented" referring to the observation of such an event, not the actual melt.) The Browning Newsletter has been observing the remarkably fast flow of the Atlantic Thermohalene Current, which carried waters north and their remarkable warming impact. Given the history of Greenland glaciers, the widespread melt is a cyclical event, but as Koenig added, "If we continue to observe melting events like this in upcoming years, it will be worrisome."

As readers of the Newsletter have frequently been told, the sun is now moving into a peak period of solar storm activity, which generally occurs every 11 years. These solar storms and the ionized gas they expel, (CMEs) threaten the electrical system on Earth in addition to some astronauts and fliers. An article from Space Weather, by the American Geophysical Union, announced that researchers from the U.S. and South Korea have developed a warning system capable of forecasting the radiation from these violent solar storms by nearly three hours (166 minutes) in advance. This gives astronauts, as well as aircrews flying over Earth's polar regions, time to take protective action.

Prof. John Bieber, University of Delaware, and Su Yeon Oh, Chungnam National University in South Korea, have found a way to measure the small first blast from a solar storm. Protons arrive in just 10 minutes and followed 3 hours later by electrons. If the first blast in strong, then the second, much larger, blast will be huge and menacing. A three-hour warning would give astronauts on deep space flights time to seek out an armored area in their spacecraft, and pilots flying in Earth's polar regions, where the planet's protective magnetic field is weaker, time to reduce their altitude.

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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.

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