

SPPI News Search 12-26-08

Solar Activity and Tropical Cyclones

<http://cozscience.org/articles/V11/N52/EDIT.php>



In an intriguing new paper, Elsner and Jagger (2008) speculate that "an increase in solar ultraviolet radiation during periods of strong solar activity will have a negative influence on tropical cyclone intensity, as the temperature near the tropopause will warm through absorption of radiation by ozone," which phenomenon, when modulated by dynamic effects in the stratosphere, "will decrease the convective available potential energy limiting the intensity of the cyclone." And they further suggest that "this effect will be most pronounced in regions of sufficient oceanic heat content and for stronger tropical cyclones."

The idea sounds logical enough; but are there any real-world data to support the concept? In an attempt designed to search for such evidence, the two Florida State University researchers conducted a number of different analyses.

First, and noting that high ocean heat content, low values of wind shear, and westerly steering currents increase the risk of Atlantic hurricanes hitting the United States, they developed a *seasonal* model of hurricane activity that employs sea-surface temperature (SST) as an indicator of ocean heat content, the Southern Oscillation Index (SOI) as a remote indicator of shear, and the North Atlantic Oscillation index (NAO) as an indicator of steering currents. Then, using the monthly sunspot number (SSN) for September -- which is the peak month of the hurricane season -- as a fourth covariate, they determined that the goodness-of-fit of the new four-parameter model was better than that of the three-parameter model, which implied a role of the type they had envisioned for solar activity, since they found that the probability of Atlantic hurricanes hitting the U.S. decreases with increasing solar activity after accounting for the NAO, SOI, and SST.

Elsner and Jagger then went on to develop a *daily* model of tropical cyclone activity for the region of the Atlantic with the greatest oceanic heat content during the hurricane season, so that "the limiting thermodynamic variable is upper atmosphere temperature rather than SST," and this model revealed an inverse relationship between solar activity and storm *intensity*, which is consistent with the results they obtained from their seasonal model of U.S. hurricane *numbers*.

Last of all, the two researchers compared seasonally-averaged (August-October) upper atmospheric temperatures with SSN over the peak hurricane season (August-September), finding "a relationship between solar activity and upper tropospheric/lower stratospheric temperatures consistent with [their] speculation that a cooler sun (fewer sunspots) results in a cooler outflow level surrounding the storm and thus greater cyclone intensity," and, of course, *vice versa*.

In light of these several findings, it would appear that the hypothesis of Elsner and Jagger is indeed correct, i.e., that there are "fewer intense tropical cyclones over the Caribbean and Gulf of Mexico when sunspot numbers are high," which appears to be due to "a reduction in the maximum potential intensity with a warming in the layer near the top of the hurricane."

Clearly, more such studies should be conducted over other parts of the world to assess the generality of this concept, which is particularly intriguing, since it indicates that changes in solar activity -- even over periods as short as a few months -- can measurably alter the nature of one of the most dramatic weather phenomena on earth. And if short-term *run-of-the-mill* variations in solar activity can do *that*, who knows what *longer-term* and potentially *greater* changes in solar activity might do for the *climate* of the world.

Sherwood, Keith and Craig Idso

Reference

Elsner, J.B. and Jagger, T.H. 2008. United States and Caribbean tropical cyclone activity related to the solar cycle. *Geophysical Research Letters* **35**: 10.1029/2008GL034431.

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NOAA Determines Ribbon Seals Should Not be Listed as Endangered

December 23, 2008

http://www.noaanews.noaa.gov/stories2008/20081223_ribbonseal.html

NOAA today announced that ribbon seals are not in current danger of extinction or likely to become endangered in the foreseeable future, and should not be listed under the Endangered Species Act.

On Dec. 20, 2007, the Center for Biological Diversity petitioned NOAA's Fisheries Service to list the ribbon seal under the Endangered Species Act. The petition said the seal faced extinction by the end of the century due to rapid melting of sea ice resulting from global warming. Sea-ice in the Bering Sea, Sea of Okhotsk, Sea of Japan, Chukchi Sea, and Beaufort Sea is the seal's primary habitat. Today's announcement is the result of NOAA's review of this petition and the condition of the ribbon seal.



"Our scientists have reviewed climate models that project that annual ice, which is critical for ribbon seal reproduction, molting and resting, will continue to form each winter in the Bering Sea and the Sea of Okhotsk where the majority of ribbon seals are located," said Jim Balsiger, NOAA's acting assistant administrator for fisheries.

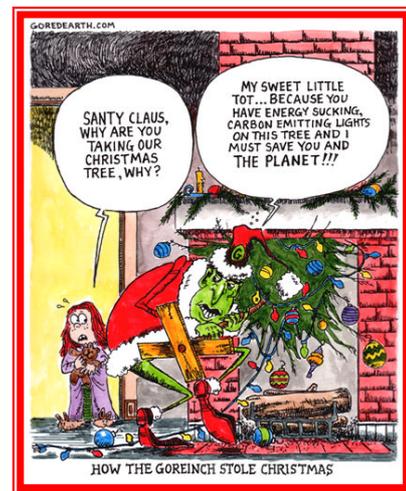
From March to June, ribbon seals use sea ice. As the ice melts during May and June, the seals haul out along the receding ice edge or in remnant patches of ice. Once the annual ice melts, most ribbon seals either migrate through the Bering Strait into the Chukchi Sea or remain in the open water of the Bering Sea during the rest of the year.

Although the number of ribbon seals is difficult to estimate accurately, scientists believe that at least 200,000 ribbon seals inhabit the Bering Sea and the Sea of Okhotsk.

Commercial hunting for ribbon seals is prohibited in the United States. Alaska Natives take a small number—fewer than 200—each year for subsistence. Russia allows a harvest of ribbon seals, but there is currently no organized harvest industry and the number of seals taken is likely to be very low.

NOAA understands and predicts changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and conserves and manages our coastal and marine resources.

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Global Warming Rope-a-Dope

http://townhall.com/columnists/WalterEWilliams/2008/12/24/global_warming_rope-a-dope
by Walter E. Williams

Americans have been rope-a-doped into believing that global warming is going to destroy our planet. Scientists who have been skeptical about manmade global warming have been called traitors or handmaidens of big oil. The Washington Post asserted on May 28, 2006 that there were only "a handful of skeptics" of manmade climate fears. Bill Blakemore on Aug. 30, 2006 said, "After extensive searches, ABC News has found no such (scientific) debate on global warming." U.N. Framework Convention on Climate Change Executive Secretary Yvo de Boer said it was "criminally irresponsible" to ignore the urgency of global warming. U.N. special climate envoy Dr. Gro Harlem Brundtland on May 10, 2007 declared the climate debate "over" and added "it's completely immoral, even, to question" the U.N.'s scientific "consensus." In July 23, 2007, CNN's Miles O'Brien said, "The scientific debate is over." Earlier he said that scientific skeptics of manmade catastrophic global warming "are bought and paid for by the fossil fuel industry, usually."

The global warming scare has provided a field day for politicians and others who wish to control our lives. After all, only the imagination limits the kind of laws and restrictions that can be written in the name of saving the planet. Recently, more and more scientists are summoning up the courage to speak out and present evidence against the global warming rope-a-dope. Atmospheric scientist Stanley B. Goldenberg of the Hurricane Research Division of the National Oceanic and Atmospheric Administration said, "It is a blatant lie put forth in the media that makes it seem there is only a fringe of scientists who don't buy into anthropogenic global warming."

Dr. Goldenberg has the company of at least 650 noted scientists documented in the recently released U.S. Senate Minority Report: "More Than 650 International Scientists Dissent Over Man-Made Global Warming Claims: Scientists Continue to Debunk 'Consensus' in 2008." The scientists, not environmental activists, include Ivar Giaever, Nobel Laureate in physics, who said, "I am a skeptic ... Global warming has become a new religion." Dr. Kiminori Itoh, an environmental physical chemist, said warming fears are the "worst scientific scandal in the history ... When people come to know what the truth is, they will feel deceived by science and scientists." "So far, real measurements give no ground for concern about a catastrophic future warming," said Dr. Jarl R. Ahlbeck, a chemical engineer at Abo Akademi University in Finland, author of 200 scientific publications and former Greenpeace member. Atmospheric physicist James A. Peden, formerly of the Space Research and Coordination Center in Pittsburgh, said, "Many (scientists) are now searching for a way to back out quietly (from promoting warming fears), without having their professional careers ruined."

The fact of the matter is an increasing amount of climate research suggests a possibility of global cooling. Geologist Dr. Don J. Easterbrook, Emeritus Professor at Western Washington University says, "Recent solar changes suggest that it could be fairly severe, perhaps more like the 1880 to 1915 cool cycle than the more moderate 1945-1977 cool cycle. A more drastic cooling, similar to that during the Dalton and Maunder minimums, could plunge the Earth into another Little Ice Age, but only time will tell if that is likely." Geologist Dr. David Gee, chairman of the science committee of the 2008 International Geological Congress, currently at Uppsala University in Sweden asks, "For how many years must the planet cool before we begin to understand that the planet is not warming? For how many years must cooling go on?"

That's a vital question for Americans to ask. Once laws are written, they are very difficult, if not impossible, to repeal. If a time would ever come when the permafrost returns to northern U.S., as far south as New Jersey as it once did, it's not inconceivable that Congress, caught in the grip of the global warming zealots, would keep all the laws on the books they wrote in the name of fighting global warming. Personally, I would not put it past them to write more.

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No Matter What Happens, Someone Will Blame Global Warming

http://www.foxnews.com/printer_friendly_story/0,3566,472084,00.html

Tuesday , December 23, 2008

FOX NEWS

[SPPI Note: half of these stories listed originated in the UK tabloid press. SPPI alerted and commented of twenty percent of them. SPPI has commented on 20 such stories, and will do more in 2009. These can be found at: <http://scienceandpublicpolicy.org/scarewatch/>]

Global warming was blamed for everything from beasts gone wild to anorexic whales to the complete breakdown of human society this year -- showing that no matter what it is and where it happens, scientists, explorers, politicians and those who track the Loch Ness Monster are comfortable scapegoating the weather.

FOXNews.com takes a look back at 10 things that global warming allegedly caused — or will no doubt soon be responsible for — as reported in the news around the world in 2008.

1. Cannibalism [SPPI note: see:

http://scienceandpublicpolicy.org/scarewatch/turner_humans_into_cannibals.html]

In April, media mogul Ted Turner [told PBS's Charlie Rose](#) that global warming would make the world 8 degrees hotter in 30 or 40 years. "Civilization will have broken down. The few people left will be living in a failed state, like Somalia or Sudan, and living conditions will be intolerable," he said.

Turner blamed global warming on overpopulation, saying "too many people are using too much stuff."

Crops won't grow and "most of the people will have died and the rest of us will be cannibals," Turner said.

2. The Death of the Loch Ness Monster

In February, [Scotland's Daily Mirror](#) reported that 85-year-old American Robert Rines would be giving up his quest for Scotland's most famous underwater denizen.

A World War II veteran, Rines has spent 37 years hunting for Nessie with sonar equipment. In 2008, "despite having hundreds of sonar contacts over the years, the trail has since gone cold and Rines believes that Nessie may be dead, a victim of global warming."

3. Beer Gets More Expensive

In April, the [Associated Press](#) reported that global warming was going to hit beer drinkers in the wallet because the cost of barley would increase, driving up the price of a pint.

Jim Salinger, a climate scientist at New Zealand's National Institute of Water and Atmospheric Research, said Australia would be particularly hard hit as droughts caused a decline in malting

barley production in parts of New Zealand and Australia. "It will mean either there will be pubs without beer or the cost of beer will go up," Salinger said at a beer brewer's convention, the AP reported.

4. Pythons Take Over America

Giant Burmese pythons – big enough to eat alligators and deer in a single mouthful – will be capable of living in one-third of continental U.S. as global warming makes more of the country hospitable to the cold-blooded predators, according to an April report from [USAToday.com](http://www.usatoday.com).

The U.S. Geological Survey and the Fish and Wildlife Service investigated the spread of "invasive snakes," like the pythons, brought to the U.S. as pets. The Burmese pythons' potential American habitat would expand by 2100, according to global warming models, the paper reported.

"We were surprised by the map. It was bigger than we thought it was going to be," says Gordon Rodda, zoologist and lead project researcher, told USA Today.com. "They are moving northward, there's no question."

5. Kidney Stones [SPPI note:

http://scienceandpublicpolicy.org/scarewatch/global_warming_causes_more_kidney-stones.html]

A University of Texas study said global warming will cause an increase in kidney stones over the next 30 years, the [Globe and Mail](http://www.globeandmail.com) reported in July.

Scientists predict that higher temperatures will lead to more dehydration and therefore to more kidney stones. "This will come and get you in your home," said Dr. Tom Brikowski, lead researcher and an associate professor at the University of Texas at Dallas. "It will make life just uncomfortable enough that maybe people will slow down and think what they're doing to the climate."

6. Skinny Whales

Japanese scientists, who have claimed that the country's controversial whaling program is all in the name of science, said in August that if they hadn't been going around killing whales, they never would have discovered that the creatures were significantly skinnier than whales killed in the late 1980s, [the Guardian reported](http://www.theguardian.com) in August.

The researchers said the study was the first evidence that global warming was harming whales by restricting their food supplies. As water warmed around the Antarctic Peninsula, the krill population shrank by 80 percent as sea ice declined, eliminating much of the preferred food of the minke whale.

The whales studied had lost the same amount of blubber as they would have by starving for 36 days, but the global warming connection couldn't be proven because no krill measurements are taken in different regions.

7. Shark Attacks

A surge in fatal shark attacks was the handiwork of global warming, according to [a report in the Guardian](http://www.theguardian.com) in May.

George Burgess of Florida University, a shark expert that maintains an attack database, told the Guardian that shark attacks were caused by human activity. "As the population continues to rise, so does the number of people in the water for recreation. And as long as we have an increase in human hours in the water, we will have an increase in shark bites," he said.

Shark attacks could also be the result of global warming and rising sea temperatures, the Guardian said. "You'll find that some species will begin to appear in places they didn't in the past with some regularity," Burgess said.

8. Black Hawk Down

Although it happened in 1993, the crash of a U.S. military helicopter in Mogadishu that became the film "Black Hawk Down" was blamed on global warming by a Massachusetts congressman in 2008.

"In Somalia back in 1993, climate change, according to 11 three- and four-star generals, resulted in a drought which led to famine," Rep. Edward Markey told a group of students who had come to the Capitol to discuss global warming, according to CNSNews.com. "That famine translated to international aid we sent in to Somalia, which then led to the U.S. having to send in forces to separate all the groups that were fighting over the aid, which led to Black Hawk Down."

9. Frozen Penguin Babies

Penguin babies, whose water-repellant feathers had not grown in yet, froze to death after torrential rains, National Geographic reported in July.

"Many, many, many of them—thousands of them—were dying," explorer Jon Bowermaster told National Geographic. Witnessing the mass penguin death "painted a clear and grim picture" of global warming.

"It's not just melting ice," Bowermaster said. "It's actually killing these cute little birds that are so popular in the movies."

10. Killer Stingray Invasion

Global warming is going to drive killer stingrays, like the one that killed Crocodile Hunter Steve Irwin, to the shores of Britain after a 5-foot -long marbled stingray was captured by fishermen, the Daily Mail reported in June.

A single touch can zap a man with enough electricity to kill, the Mail said, and global warming is bringing the Mediterranean killers north.

"Rising sea temperatures may well have brought an influx of warm water visitors," sea life curator Alex Gerrard told the Mail. "Where there's one electric ray, it's quite likely that there are more."

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Madison on the brink of impressive snow record for December 2008

<http://www.thedailypage.com/daily/article.php?article=24656>

How snow can you go
David Medaris on Tuesday 12/23/2008

The approach of Christmas Eve -- and still more imminent storms -- heightens the temptation to talk about the weather this December in biblical terms. As of Monday morning, the [National Weather Service Milwaukee/Sullivan office](#) was reporting 30.1 inches of snowfall on Madison for the first three weeks of the month. That's well ahead of the pace observed during last year's seasonal snow record, when a mere 23.6 inches had fallen over the same period.

The NWS daily summary for December 21 in Madison also notes that the seasonal total for 2008 is likewise ahead of the 2007 pace. So far this winter, 34.4 inches of snow have fallen on Mad City. That's almost 10 inches more than the 25.1 that fell through Dec. 21, 2007. To see what this looks like in chart form, check out the NWS comparisons [here](#).

A winter weather advisory is in effect on Tuesday, with light snow falling overnight and an additional accumulation of several inches expected through the day. An overlapping winter storm watch is scheduled to take effect late Tuesday and extend through Wednesday afternoon, meanwhile, with still another four to five inches of snow forecast for that period. Total projection for Madison between now and Christmas Eve: nine to 11 inches.

This puts the city on the brink of its snowiest December on record, with figures dating back to 1871. The record: 35 inches, measured between December 1-31, 2000. Adding the nine to 11 inches of snow forecast between now and Christmas Eve to the 30.1 inches that have fallen since the beginning of December, and we're looking at snowfall totals in the neighborhood of 40 inches for the month -- with another full week to go before we turn the page from into the new year.

This is great news for skiers and snowshoe enthusiasts, kids with sleds, people who like to shovel and anyone else who subscribes to the notion that as long as it's going to be cold outside, there might as well be plenty of snow to enjoy. Not so great for iceboaters and ice-skating enthusiasts. But if everyone was happy all at once, life might be so enjoyable we wouldn't be able to bear all that good fortune.

Winter 2008 vs Winter 2007 - Updated

So far this month the million dollar question has been... "Will this winter be just like last winter?"

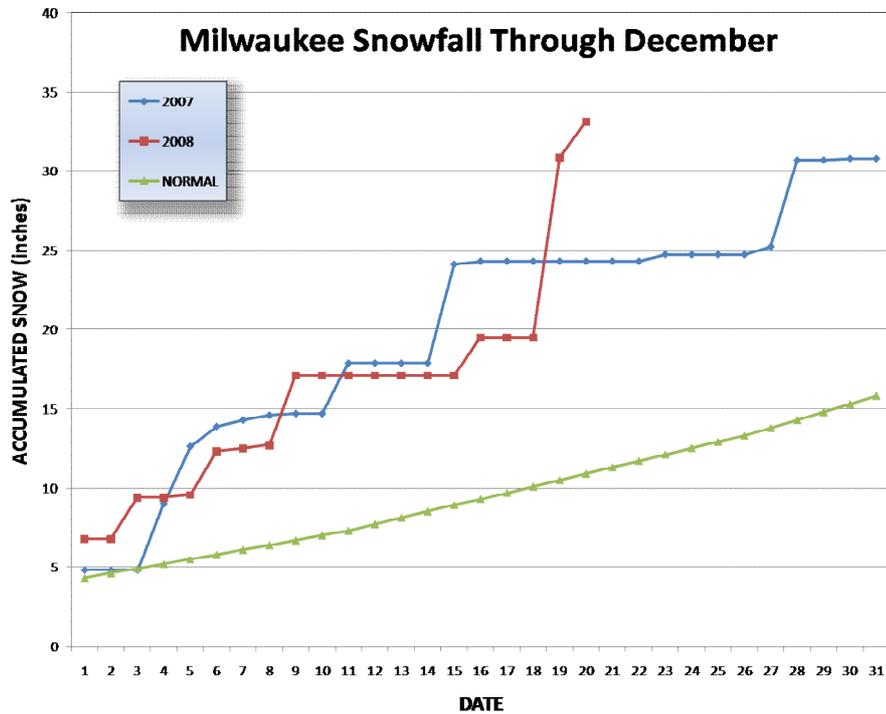
Well, we are still looking at equal chances of above, below and near normal precipitation for the Dec-Feb period. But if we look at just so far through December, we're well above normal values so far this season in both Madison and Milwaukee. We're also looking at comparable numbers to last year. In fact, in Milwaukee we've gone back and forth between 2007 and 2008 having more accumulated snow to-date in the past few weeks. Madison had been consistently slightly below last year on accumulated snow, but with the December 19 storm, have moved above last years pace.

The below graphs show 2007 snowfall (blue line), 2008 snowfall so far (red line), and normal snowfall (green line).

As of December 20:

Milwaukee has 33.1" on the season...the total through this date last year was 24.3"
Madison has 34.4" on the season...the total through this date last year was 25.1"

*Note: These values are initialized including November values.



Solar Forcing of Droughts in East-Central North America

<http://co2science.org/articles/V11/N52/C2.php>

Reference

Springer, G.S., Rowe, H.D., Hardt, B., Edwards, R.L. and Cheng, H. 2008. Solar forcing of Holocene droughts in a stalagmite record from West Virginia in east-central North America. *Geophysical Research Letters* **35**: 10.1029/2008GL034971.

What was done

The authors derived a multi-decadal-scale record of Holocene drought in east-central North America based on Sr/Ca ratios and $\delta^{13}\text{C}$ data obtained from stalagmite BCC-002 from Buckeye Creek Cave (BCC), West Virginia (USA) that "grew continuously from ~7000 years B.P. to ~800 years B.P." and then again "from ~800 years B.P. until its collection in 2002."

What was learned

Springer *et al.* identified seven significant Mid- to Late-Holocene droughts, six of which "correlate with cooling of the Atlantic and Pacific Oceans as part of the North Atlantic Ocean ice-rafted debris [IRD] cycle, which has been linked to the solar irradiance cycle," as per Bond *et al.* (2001). In addition, they determined that the Sr/Ca and $\delta^{13}\text{C}$ time series "display periodicities of ~200 and ~500 years and are coherent in those frequency bands." They also say "the ~200-year periodicity is consistent with the de Vries (Suess) solar irradiance cycle," and they "interpret the ~500-year periodicity to be a harmonic of the IRD oscillations." Noting further that "cross-spectral analysis of the Sr/Ca and IRD time series yields statistically significant coherencies at

periodicities of 455 and 715 years," they go on to note that "these latter values are very similar to the second (725-years) and third (480-years) harmonics of the 1450 ± 500 -years IRD periodicity."

What it means

The five researchers conclude their report by saying their findings "corroborate works indicating that millennial-scale solar-forcing is responsible for droughts and ecosystem changes in central and eastern North America (Viau *et al.*, 2002; Willard *et al.*, 2005; Denniston *et al.*, 2007)," adding that their high-resolution time series now provide even *stronger* evidence "in favor of solar-forcing of North American drought by yielding unambiguous spectral analysis results."

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Viau, A.E., Gajewski, K., Fines, P., Atkinson, D.E. and Sawada, M.C. 2002. Widespread evidence of 1500 yr climate variability in North America during the past 14,000 yr. *Geology* **30**: 455-458.

Willard, D.A., Bernhardt, C.E., Korejwo, D.A. and Meyers, S.R. 2005. Impact of millennial-scale Holocene climate variability on eastern North American terrestrial ecosystems: Pollen-based climatic reconstruction. *Global and Planetary Change* **47**: 17-35.

Reviewed 24 December 2008

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"Rocky Mountain High"

<http://co2science.org/articles/V11/N52/C1.php>

Reference

Kipfmueller, K.F. 2008. Reconstructed summer temperature in the northern Rocky Mountains wilderness, USA. *Quaternary Research* **70**: 173-187.

What was done

Ring widths of whitebark pine (*Pinus albicaulis* Englem.) and subalpine larch (*Larix lyallii* Parl.) trees growing at three high-elevation sites in the Selway-Bitterroot Wilderness Area (SBW) near the border of Idaho and Montana, USA, were used to develop tree-growth chronologies that were subsequently compared, in the words of the authors, to "monthly temperature and precipitation data from individual station records, gridded climate datasets, and regionally averaged instrumental records," in order to reconstruct a history of the area's summer temperature anomalies over the period AD 1544 through 1998.

What was learned

Kipfmueller reports, first of all, that "in the SBW, *as in many other areas* [our italics and bold], volcanic eruptions and solar variability" -- or, with respect to the latter factor, what is more explicitly stated in the paper's abstract to be "reduced solar activity" -- "appear to result in pronounced cooling at interannual to decadal scales." In addition, he states that "anomalous

warming over the 20th century," such as that portrayed by the hockeystick temperature history of climate-alarmist fame, "was not as evident in this reconstruction as has been reported elsewhere." Giving even more support for the reality of this latter result, Kipfmueller also notes that "the instrumental record, both at individual stations, in the divisional record, and from gridded temperature records, did not indicate significant trend in summer temperature (AD 1928-1998)."

What it means

Once again, we are led to say: *Not much global warming here!* And this being the case in a place that is clearly demonstrated to be *responsive to changes in solar and volcanic activity*, we are led to wonder why there has been no response to the past century's historic increase in the air's CO₂ content.

Well, to be totally truthful, we actually *don't* wonder, as we believe that a number of negative feedback phenomena of both a biological and physical nature tend to largely counter the modest greenhouse effect of the rising atmospheric CO₂ concentration, rendering its impetus for warming too small to even detect.

Reviewed 24 December 2008

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Tropical Cyclones (Atlantic Ocean - Global Warming Effects: Frequency, The Past Few Millennia) -- Summary

<http://co2science.org/subject/h/summaries/hurratlanmill.php>

Has the warming of the past century increased the yearly number of intense Atlantic Basin hurricanes? We investigate this question via a brief review of some studies that have explored this question via thousand-year reconstructions of the region's intense hurricane activity.

[Liu and Fearn \(1993\)](#) analyzed sediment cores retrieved from the center of Lake Shelby in Alabama (USA) to determine the history of intense (category 4 and 5) hurricane activity there over the past 3,500 years. This work revealed that over the period of their study, "major hurricanes of category 4 or 5 intensity directly struck the Alabama coast ... with an average recurrence interval of ~600 years." They also report that the last of these hurricane strikes occurred about 700 years ago. Hence, it would appear that 20th-century global warming has not accelerated the occurrence of such severe storm activity.

Seven years later, [Liu and Fern \(2000\)](#) conducted a similar study based on sixteen sediment cores retrieved from Western Lake, Florida (USA), which they used to produce a proxy record of intense hurricane strikes for this region of the Gulf of Mexico that covered the past 7000 years. In this study, twelve major hurricanes of category 4 or 5 intensity were found to have struck the Western Lake region. Nearly all of these events were centered around a 2400-year period between 1000 and 3400 years ago, when 11 of the 12 events were recorded. In contrast, between 0 to 1000 and 3400 to 7000 years ago, only one and zero major hurricane strikes were recorded, respectively. According to the two researchers, a probable explanation for the "remarkable increase in hurricane frequency and intensity" that affected the Florida Panhandle and the Gulf Coast after 1400 BC would have been a continental-scale shift in circulation patterns that caused the jet stream to shift *south* and the Bermuda High *southwest* of their earlier Holocene positions, such as would be expected with global *cooling*, giving strength to their contention that "paleohurricane records from the past century or even the past millennium are not long enough to capture the full range of variability of catastrophic hurricane activities inherent in the Holocene climatic regime."

Consequently, the next time a major Atlantic hurricane makes landfall somewhere on the Gulf Coast of the United States, don't give in to climate-alarmist hype and immediately point the finger of blame at global warming. Such occurrences may well fall within the range of millennial-scale

climate variability. And remember, also, that from 3400 to 7000 years ago, the earth was experiencing what is known as the Holocene Maximum, which was *the warmest period of the current interglacial*. And that 3600-year period saw *zero* category 4 or 5 intensity hurricanes in the Western Lake region of Florida.

Last of all, we have the study of [Donnelly and Woodruff \(2007\)](#), who state that "it has been proposed that an increase in sea surface temperatures caused by anthropogenic climate change has led to an increase in the frequency of intense tropical cyclones," citing the studies of Emanuel (2005) and Webster *et al.* (2005), which is also the view Al Gore expressed in his 21 March 2007 testimony to the U.S. Senate's Environment & Public Works Committee. Thus cognizant of the great need to have a much longer record of the frequency of occurrence of intense hurricanes than that used by Emanuel and Webster *et al.* to draw the politically-charged conclusions Mr. Gore and others have since been championing, Donnelly and Woodruff developed "a record of intense [category 4 and greater] hurricane activity in the western North Atlantic Ocean over the past 5,000 years based on sediment cores from a Caribbean lagoon [Laguna Playa Grande on the island of Vieques, Puerto Rico] that contains coarse-grained deposits associated with intense hurricane landfalls."

Based on this work, the two researchers from the Woods Hole Oceanographic Institution detected three major intervals of intense hurricane strikes: one between 5,400 and 3,600 calendar years before present (yr BP, where "present" is AD 1950), one between 2,500 and 1,000 yr BP, and one after 250 yr BP. They also report that coral-based sea surface temperature (SST) data from Puerto Rico "indicate that mean annual Little Ice Age (250-135 yr BP or AD 1700-1815) SSTs were 2-3°C cooler than they are now," and they say that "an analysis of Caribbean hurricanes documented in Spanish archives indicates that 1766-1780 was one of the most active intervals in the period between 1500 and 1800 (Garcia-Herrera *et al.*, 2005), when tree-ring-based reconstructions indicate a negative (cooler) phase of the Atlantic Multidecadal Oscillation (Gray *et al.*, 2004)."

In light of these findings, Donnelly and Woodruff concluded that "the information available suggests that tropical Atlantic SSTs were probably not the principal driver of intense hurricane activity over the past several millennia." Indeed, there is *no compelling reason* to believe that the current level of intense hurricane activity is in any way unprecedented or that it has been caused by global warming, in contrast to what climate alarmists continue to claim. Quite to the contrary, the two researchers write that "studies relying on recent climatology indicate that North Atlantic hurricane activity is greater during [cooler] La Niña years and suppressed during [warmer] El Niño years (Gray, 1984; Bove *et al.*, 1998), due primarily to increased vertical wind shear in strong El Niño years hindering hurricane development."

In summary, millennial-scale reconstructions of intense hurricane activity within the Atlantic Basin provide no support for the climate-alarmist claim that global warming will lead to the creation of more intense Atlantic hurricanes that will batter the east, southeast, and southern coasts of the United States. In fact, they suggest just the *opposite*.

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