

ENVIRONMENTAL ENGINEERING NEWSLETTER

2 SEPT. 2013

Please be aware any Newsletter URL ending in **020701.pdf** and **020610.pdf** are available for downloading only during the six days following the date of the edition. If you need older URLs contact George at ghh@att.net.

Please Note: This newsletter contains articles that offer differing points of view regarding climate change, energy and other environmental issues. Any opinions expressed in this publication are the responses of the readers alone and do not represent the positions of the Environmental Engineering Division or the ASME.

George Holliday

This week's edition includes:

1) ENVIRONMENT – A. BSEE PROPOSES CHANGES TO OFFSHORE PRODUCTION SYSTEM RULES

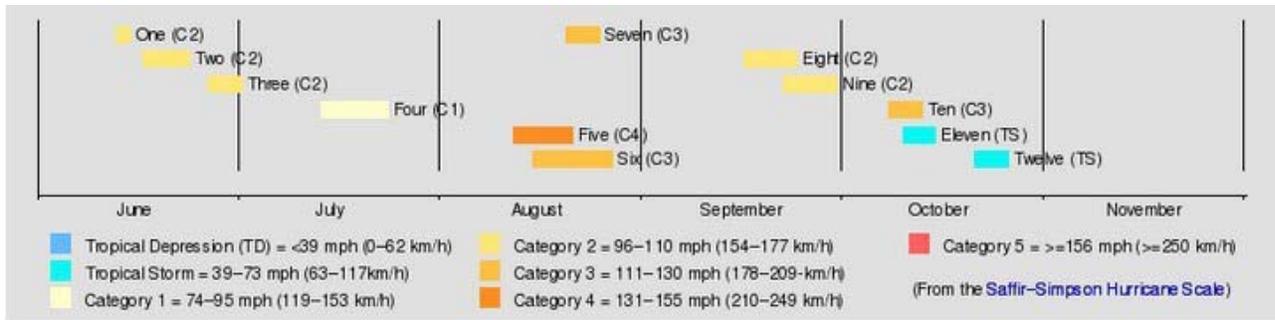
The Bureau of Safety and Environmental Enforcement has proposed a rule to toughen standards for offshore oil and natural gas production systems as energy producers explore deeper waters. The proposal would subject foam firefighting systems and other key safety and pollution prevention equipment to more thorough reviews and would also include several American Petroleum Institute standards for offshore production facilities. "Safety is a core value for our industry, as evidenced by the fact that BSEE has incorporated more than a dozen industry standards developed by API into this proposed rule," API spokesman Brian Straessle said. <http://fuelfix.com/blog/2013/08/21/feds-propose-new-rules-for-offshore-production-systems/>

B. SLOWEST START TO A HURRICANE SEASON ON RECORD

Posted on [August 24, 2013](#) by [stevengoddard](#)

Obama says that hurricanes are getting worse, based on some research done at the Choom Climatological Institute.

As we approach the end of August, there have been no Atlantic hurricanes. By this date in the year 1886, there had already been seven hurricanes – including three major hurricanes, one of which wiped the city of Indianola, Texas off the map.



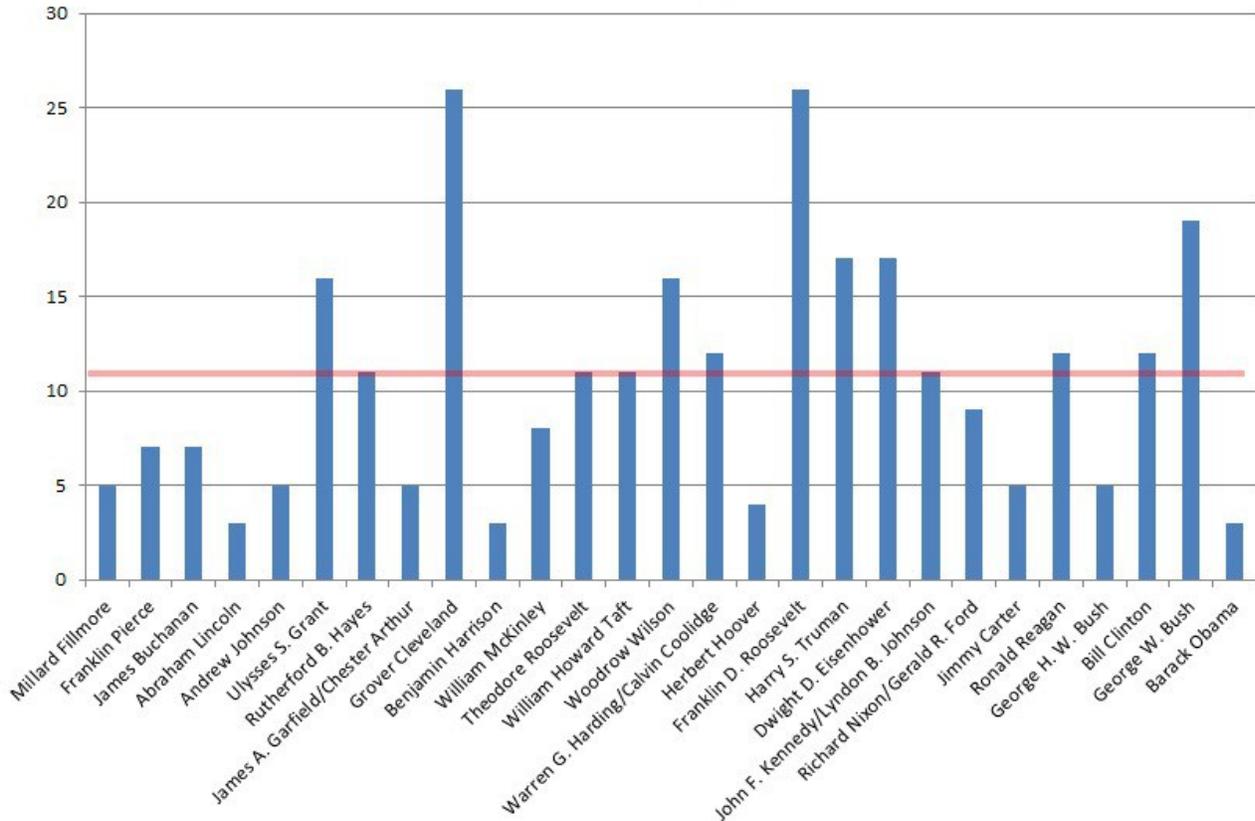
[1886 Atlantic hurricane season – Wikipedia, the free encyclopedia](https://en.wikipedia.org/wiki/1886_Atlantic_hurricane_season)

A kinder, gentler natural hurricane from 1886



Obama's presidency has also seen the fewest US hurricane landfalls of any president. Three hurricanes have hit the US while he was in office, compared to twenty-six while Grover Cleveland was in office.

US Hurricane Count By President



Don Shaw

C. CARBON MANAGEMENT TECHNOLOGY CONFERENCE 2013

October 21-23, 2013

Hilton Alexandria Old Town Alexandria, VA

This foundational conference, sponsored by the eight major engineering societies (ASME, AIChE, IEEE, ASCE, TMS, SME, SPE and AIST), draws practiced professionals from all engineering disciplines to share their expertise and provide perspective on the reduction of greenhouse gas emissions and adaptation to changing climate. The conference will focus on engineering perspectives regarding technologies, strategies, policies, management systems, uncertainties, and metrics for evaluating alternatives. Gain engineering expertise, experience and perspectives on technologies, strategies, policies, management systems, metrics, and other key issues. Discover novel approaches and new technologies that are instrumental to technical, economic and social advancements in carbon management.

Through robust scheduled sessions, well-known speakers from leading companies and academic institutions, co-located workshops, and networking opportunities, this year's program will address 20+ topics under these four themes:

- Carbon Capture, Utilization and Storage
- Carbon Management Pathways from Electricity Generation to End User
- Potentially Game-Changing Technology and Evaluation
- Engineering Challenges and Solutions for Adaptation to Climate Change

To view the technical program, visit <http://fscarbonmanagement.org/content/technical-program>
Register today and be part of the one conference focused on the engineering perspectives critical to meeting the challenge of greenhouse gas emissions.

For more information or to register, please visit us at
<http://fscarbonmanagement.org/content/cmtc-2013>

Arnold Feldman

D. ASME is planning to develop an annual large scale Energy Conference. Its first one is being planned for March 17–19, 2014 in San Diego and will focus on fracking.

Arnold Feldman

E. EED MEETING ANNOUNCEMENT

The Environmental Engineering Division (EED) is planning two meetings for all its members who are able to attend, one on the East Coast and one on the West Coast.

The East Coast meeting will be held in conjunction with the Carbon Management Technology Conference (CMTC), which will take place at the Hilton Alexandria Old Town in Alexandria, VA, October 21-23. The EED meeting will be held the afternoon of Tuesday, October 22, from 1PM -3PM.

The West Coast meeting will be held during IMECE 2013 in San Diego, CA, November 15-21. The specific date and time have not yet been set.

At both meetings, we will discuss the recent EED member survey, the revised Division By-Laws, and interest in forming and participating in new technical committees identified as being of interest in the survey. EED members who wish to attend the Division meeting will not be required to register for either conference, although there are certainly benefits to attending these conferences if you are able.

For more information on the EED meetings contact:

- East Coast: Arnie Feldman, EED ViceChair, 267-880-2325, jjdsenv@att.net
- West Coast: Andy Miller, EED Chair, 213-244-1809, Miller.Andy@epa.gov

F. GLOBAL CCS INSTITUTE CCS WORKSHOP AT CMTC 2013

You are invited to participate in a workshop titled *CCS/CCUS Overview: What It Is and What Are Its Implications?* The workshop is sponsored by the Global CCS Institute in collaboration with the 2013 Carbon Management Technology Conference. It will be held at the Hilton Alexandria Old Town in Alexandria, VA on Sunday, October 20, 2013, and is geared to

individuals who are involved in carbon dioxide management but who may not be an expert in all aspects.

Registration for this workshop is free: <https://chenected.wufoo.com/forms/registration-ccscucus-overview-workshop/> and a networking reception will be held for all attendees after the completion of the workshop. For those who wish to further enhance their knowledge of carbon management we encourage you to also attend the Carbon Management Technology Conference (CMTc 2013), sponsored by AIChE, ASME, ASCE, IEEE, AIST, SPE, TMS, and SME which begins on Monday October 21. For more information visit the website: <http://www.fscarbonmanagement.org/content/cmtc-2013>

2) HEALTH – A. DENGUE FEVER CASES CONFIRMED IN FLORIDA

STUART, Fla. - A rare illness is showing up in Florida.

According to the Florida Department of Health, three people have been confirmed to have Dengue Fever in Martin and St. Lucie counties in the central part of the state. <http://www.fox4now.com/news/local/Dengue-Fever-cases-confirmed-in-Florida-220074321.html>

3) SAFETY – A. NATIONAL CENSUS OF FATAL OCCUPATIONAL INJURIES IN 2012

(PRELIMINARY RESULTS)

A preliminary total of 4,383 fatal work injuries were recorded in the United States in 2012, down from a revised count of 4,693 fatal work injuries in 2011, according to results from the Census of Fatal Occupational Injuries (CFOI) conducted by the U.S. Bureau of Labor Statistics. The 2012 total represents the second lowest preliminary total since CFOI was first conducted in 1992. The rate of fatal work injury for U.S. workers in 2012 was 3.2 per 100,000 full-time equivalent (FTE) workers, down from a rate of 3.5 per 100,000 in 2011.

<http://www.bls.gov/news.release/cfoi.nr0.htm>

B. INTERIOR, ENERGY SEEK TO ENHANCE SAFETY IN OFFSHORE DRILLING

The Department of the Interior and the Department of Energy said on Friday that they will collaborate on finding ways to further strengthen safety in offshore oil and natural gas development. "We will continue to prevent duplication and increase the effectiveness of our ability to create a regulatory environment that fosters the safe and responsible development of the nation's energy resources," said James Watson, director of Interior's Bureau of Safety and Environmental Enforcement.

<http://www.platts.com/latest-news/oil/washington/us-interior-energy-departments-to-cooperate-on-21465420>

C. U.K. GROUP CALLS FOR SUSPENSION OF HELICOPTERS AFTER CRASH

Step Change in Safety Seeks Halt to Over-Water Passenger Flights

By SELINA WILLIAMS

And DOUG CAMERON

An influential North Sea energy trade group on Saturday called for all Eurocopter Super Puma helicopters to be suspended from over-water passenger [flights](#) in the U.K. in the wake of Friday's fatal accident off Shetland, which claimed the lives of four oil workers.

Step Change in Safety, which represents the main [oil and gas](#) operators in the sector as well as employee groups, called for the temporary suspension of the Eurocopter AS332—the type involved in Friday's crash—as well as the EC225 model, which was last month cleared to return to service after being grounded by air-safety regulators for 10 months following two non-fatal accidents last year.

U.K. and European air-safety regulators have yet to seek any grounding as a probe into the latest crash continues, but the stance taken by [energy companies](#) and unions will effectively force helicopter operators to cease over-water flying.

CHC Helicopter, the firm which operated the aircraft involved in Friday's crash, didn't fly any North Sea missions from Scotland Saturday and said it was grounding its global fleet of the L2 version of the AS332.

"We do not know the cause of the incident," CHC said in a statement. "A full investigation will be carried out in conjunction with the U.K. Air Accident Investigation Branch.

Eurocopter, a unit of European Aeronautic Defence and Space Co., didn't respond to a request for comment. Bristow Group Inc., another large helicopter operator, didn't respond to a request for comment.

With dozens of helicopters grounded, the industry faces the challenge of keeping supplies and personnel flowing to offshore platforms. Oil and gas operators and contractors are due to meet Monday to evaluate ways to address the logistical challenges, said the Step Change in Safety trade group in a statement Saturday.

The group said it had taken the precautionary measure of recommending temporary suspension of all Super Puma commercial passenger [flights to](#) and from offshore oil and gas installations within the U.K.

Only aircraft being used for emergency search and rescue efforts would be exempted.

There's already a global shortage of suitable helicopter capacity for the energy industry, with the Eurocopter EC225 only expected to return to service in the final quarter. Some 80 EC225s were barred from flying over water after the second of the two incidents in the North Sea traced to gearbox problems, requiring operators to rely on other helicopters such as the AC332.

Operators were in the process of testing the EC225 with a view to returning it to operations, a process executives said hinged on securing the confidence of oil workers and their employers.

Using vessels to transfer personnel to rigs instead of helicopters is tricky because it requires calm weather conditions, a rarity in the typically choppy North Sea. Furthermore, [traveling](#) out to a rig on a ship can take as much as 24 hours.

Step Change For Safety said it "will closely monitor the situation and will only recommend resumption of flights by one or more of the Super Puma variants when it considers that sufficient factual information is available to support the decision."

4. TRANSPORTATION – A. PIPELINE-CAPACITY SQUEEZE REROUTES CRUDE OIL

More crude oil is moving around the U.S. on trucks, barges and trains than at any point since the government began keeping records in 1981, as the energy industry devises ways to get around a pipeline-capacity shortage to take petroleum from new wells to refineries.

<http://www.eandp-environment.net/Transportation/Transportation020610.pdf>

COMMENTS:

A. THE WEEK THAT WAS: 2013-08-24 (AUG. 24, 2013)

By Ken Haapala, Executive Vice President, Science and Environmental Policy Project (SEPP)

#####

Parameters: The quote of the week illustrates what is wrong with the entire process of attempting to assess the causes of climate change as it is practiced by governments and the UN Intergovernmental Panel on Climate Change. In general, the more parameters, factors that vary, a model has that are specified for the model, the greater is the uncertainty within the model. The Summary for Policymakers of IPCC's Fourth Assessment Report 2007 identified nine parameters

for Global Mean Radiative Forcings, only one, solar irradiance, being natural. The ranges of error are large, and in some cases it is uncertain if the parameter amplifies or reduces warming caused by increasing carbon dioxide (CO₂) concentrations in the atmosphere from human emissions.

According to reports, rather than attempting to determine the values of excess parameters external of the models, model builders are adding more parameters to the models. These actions evoke the images from a famous scene in Walt Disney's cartoon movie, Fantasia – dancing pink elephants.

Please see links under Challenging the Orthodoxy.

The 95% Certainty: The scientists preparing the Summary for Policymakers (SPM) for the IPCC's Fifth Assessment Report are leaking to a largely favorable press that they are 95% confident that humans caused the late 20th century warming. This is critical to the claim that human emissions of CO₂ and other greenhouse gases are causing Catastrophic Anthropogenic Global Warming (CAGW).

The figure is scientifically meaningless. A statistical distribution can be calculated over the results from the some 73 global climate models, but the models have never been validated and only one valid model would have been sufficient. As discussed above, the models have significant, unknown, internal uncertainty. Further, CO₂ emissions do not explain the significant warming of the first part of the 20th century, the current pause in warming of at least a decade (in the atmosphere and at least 15 years on the surface) and the regional nature of the of the warming, which is occurring in the northern part of the Northern Hemisphere with little warming elsewhere.

Physicist Luboš Motl is unimpressed. He writes: "Even if the figure 95% were credible, calculated, and replaced by a much higher figure, the statement we have "learned" is completely unspectacular, pretty much inconsequential, and unworthy of spending another dollar." He writes that the number is pulled out of the air, 95% is painfully low, and draws an analogy with what is required in particle physics. After the IPCC scientists are finished, the SPM will be reviewed by government representatives to determine if it is acceptable before it is published. The review will take place in late September.

That prompts the question, why the leaks? Do these scientists think they can intimidate the governments of China, India, Russia, Brazil, and South Africa into accepting their highly questionable findings? They may be surprised. Please see links under The 95% Certainty.

New AGU: On the web site of Anthony Watts, Roger Pielke, Sr. writes of his experiences in attempting to have his dissent to the Statement on Climate Change of the American Geophysical Union (AGU) printed in the AGU flagship publication EOS. The authoritarian attitude of the new leadership of AGU is more fitting a military organization than a scientific society. Please see link under Suppressing Scientific Inquiry.

A Climate Change Statement: Last week's TWTW stated that the total number of science societies which requested membership review before publishing a statement on climate change was zero. Bob Carter, an editor of the reports by the Nongovernmental International Panel on Climate Change, quickly corrected TWTW. The Geological Society of Australia did publish a draft statement for membership review before adoption. The effort was headed by past president Brad Pillans and is certainly worth reading. Thankfully, TWTW stands corrected. Please see links under Seeking a Common Ground.

Courage: In a provocative essay entitled "Scientists and motivated reasoning" Judith Curry mentions some of her experiences for publically discussing the uncertainty in climate science and its models. It is an outstanding exposition on the need for, and perils of, advocating integrity in climate science. Curry is to be thanked for having the courage to follow the data rather than the crowd. Please see link under Suppressing Scientific Inquiry.

Extreme Weather: Roger Pielke, Jr. has posted his written responses to written questions from two Senators on the Environment and Public Works Committee following Pielke's testimony challenging the claims of increasing extreme weather events. The data does not support the claims. Apparently, Senator Sheldon Whitehouse from Rhode Island prefers the dogma to the data and asked Pielke to supply a full list of funding for his current research. No dirty oil or coal money here.

In a softball question, Senator David Vitter from Louisiana referenced a survey of corporate executives by Lloyd's of London about risks their business face. He asked Pielke why climate change was ranked # 32, behind piracy but ahead of space weather. Please see link under Seeking a Common Ground

Social Cost of Carbon: The paper by MIT Economist Robert Pindyck published by the National Bureau of Economic Research continues to provoke articles on the weakness of the calculations by government agencies of the Social Cost of Carbon, which is being used by various agencies to insist on government control in the manufacture of consumer goods, such as microwave ovens. There is every reason to anticipate the expansion of such controls.

Pindyck discusses what are called Integrated Assessment Models (IAM) and they have two major problems: 1) the sensitivity of the planet to increased concentrations of CO₂; and 2) the economic impact of higher temperatures. The former does not particularly concern Pindyck, but the latter does. He states that the three IAMs he investigated essentially plucked the economic impact of higher temperatures from air. He states that the estimates are not based on theory or data. Even though he believes in the possibility of CAGW, he believes the models should not be

used to estimate its effects. Among other reasons he states is that the models underestimate the possibility of catastrophe.

As stated above, global climate models have not established that the planet is particularly sensitive to increasing CO₂. All 73 global climate models tested are overestimating the warming of the atmosphere over the tropics.

The morass of models creates a dilemma on how to legally challenge the calculations of the social cost of carbon. During the oral arguments on the EPA Endangerment Finding the chief justice of the US Circuit Court of Appeals for the District of Columbia made it clear that he will not tolerate any challenge to EPA science and there is little question that the EPA will exploit the court's position to expand its power. Further, attorneys representing the EPA argued the models are valid.

Herein may be a weakness.

However, the social cost of carbon cannot be estimated, or even logically evaluated, to any degree of confidence until there is a validated climate model predicting the increase in temperature from increasing atmospheric carbon dioxide. It may be possible to petition the court to have the EPA identify a validated climate model and explain how it was scientifically validated as well as demonstrate its predictive powers. How successfully did the model predict the current pause in temperature rise, how well did it predict the lack of significant warming over the tropics? The EPA has 19 US models from which to choose. Of course, a valid climate model does not exist.

Such an approach may avoid the trap of arguing over the various economic damage models, which would only benefit the government agencies advocating the social cost of carbon. Please see links under Challenging the Orthodoxy.

New Technology? Covering a bit of history, Robert Bradely Jr, points out the fracturing of wells in the US started with using gun powder as early as 1808 in water wells and was used to fracture oil wells in the 1860s. Please see link under Oil and Natural Gas – the Future or the Past?

Covering Up Liberty: The cover of the National Geographic magazine shows the Statue of Liberty about one-half submerged by sea water. Using data from the tidal gage at the Battery, on Manhattan, about 1.7 miles away, Anthony Watts calculates it would take 23,500 years before this would occur, assuming sea levels continue to rise as they have in the past centuries and a new Ice Age does not happen.

Its web site states: "The mission of the National Geographic Society is to inspire people to care about the planet." The question is how gullible do the editors of National Geographic think their readers are? Please see links under Communicating Better to the Public – Make things up and <http://press.nationalgeographic.com/about-national-geographic/>

Additions and Corrections: Reader Christopher Game correctly points out a sentence used to describe the discussion paper by Hans von Storch and his team was awkward. TWTW followed the language of the paper.

A clearer description comes in an interview of Storch during which reporters from Der Spiegel asked if climate simulations show a long standstill in temperature change that is being observed now. Storch answered: "Yes, but only extremely rarely. At my institute, we analyzed how often such a 15-year stagnation in global warming occurred in the simulations. The answer was: in under 2 percent of all the times we ran the simulation. In other words, over 98 percent of

forecasts show CO2 emissions as high as we have had in recent years leading to more of a temperature increase.”

Storch further stated: “If things continue as they have been, in five years, at the latest, we will need to acknowledge that something is fundamentally wrong with our climate models. A 20-year pause in global warming does not occur in a single modeled scenario. But even today, we are finding it very difficult to reconcile actual temperature trends with our expectations.”

Although TWTW may disagree with Storch’s conclusions, his candor is refreshing. As always, TWTW appreciates readers who suggest Additions and Corrections. Please see link under Models v. Observations

Number of the Week: 8.8% v 155.8%. In its 2013 estimate of levelized costs for plants put into service in 2018, the US Energy Information Administration calculated the production and the costs for both on-shore wind and off-shore wind. The estimates are rough but illustrative. The on-shore production was estimated to be at 34% of nameplate capacity and the off-shore production was 37%. The total costs are \$86.60 per mega-watt hour and \$229.5 per mWh. One can realize an 8.8% increase in production by going off-shore and spending only 155.8% more! Is this a difficult decision? Please see link under Energy Issues – US

<http://www.sepp.org/twtwfiles/2013/TWTW%208-24-13.pdf>

B. DEFICIENCIES OF MODELED TEMPERATURE EXTREMES **(20 AUG 2013)**

Reference Morak, S., Hegerl, G.C. and Christidis, N. 2013. Detectable changes in the frequency of temperature extremes. *Journal of Climate* **26**: 1561-1574.

Morak *et al.* (2013) report that studies of observational temperature records over the last 50-100 years have found evidence for increases in both mean and extreme (maximum and minimum) near-surface air temperatures; but they note that the increase in maximum temperature has been of smaller magnitude than the increase in minimum temperature, which state of affairs has led to a decrease in the diurnal temperature range.

In further exploring this intriguing subject, Morak *et al.* compared "observed and climate model-simulated trends in mean values of temperature extreme indices, splitting the year into the dynamically active boreal cold (ONDJFM) and warm (AMJJAS) seasons." This they did using "modeled daily minimum and maximum surface temperature data derived from simulations with the Hadley Centre Global Environmental Model, version 1 (HadGEM1)."

Among a number of other things, several unfortunate findings came to the fore, namely, the three UK researchers report that the model: (1) "significantly underestimates changes in some [regions](#), particularly in winter across large parts of Asia," (2) "has a tendency to overestimate changes in the frequency of hot days in both the [a] winter and [b] summer seasons over [c] most regions, and in the [d] global and [e] hemispheric mean," (3) "also overestimates changes in the frequency of warm winter days on larger scales," while with respect to changes in cold extremes the model (4) "does underestimate them in some regions," while (5) "there are some regions with trends of the opposite sign." In addition, they say that (6) "the particular regional trend pattern, often also referred to as the 'warming hole,' is not evident in the simulated trend pattern," citing Pan *et al.* (2004), Kunkel *et al.* (2006), Portmann *et al.* (2009) and Meehl *et al.* (2012). And they

indicate that (8) "the model shows a tendency to significantly overestimate changes in warm daytime extremes, particularly in summer."

Although the HadGEM1 does some things well, there are a number of other things that it has yet to satisfactorily accomplish.

Additional References

Kunkel, K.E., Liang, X.-Z., Zhu, J. and Lin, Y. 2006. Can CGCMs simulate the twentieth-century "warming hole" in the central United States? *Journal of Climate* **19**: 4137-4153.

Meehl, G.A., Arblaster, J.M. and Branstator, G. 2012. Mechanisms contributing to the warming hole and the consequent U.S. east-west differential of heat extremes. *Journal of Climate* **25**: 6394-6408.

Pan, Z., Arritt, R.W., Takle, E.S., Gutowski, J.W., Anderson, C.J. and Segal, M. 2004. Altered hydrologic feedback in a warming climate introduces a warming hole. *Geophysical Research Letters* **31**: 10.1029/2004GL020528.

Portmann, R.W., Solomon, S. and Hegerl, G.C. 2009. Spatial and seasonal [patterns](#) in climate change, temperatures, and precipitation across the United States. *Proceedings of the National Academy of Sciences* **106**: 7324-7329.

Archived 20 August 2013

C. DRY HEATHLAND RESPONSE TO ELEVATED CO₂, WARMING AND DROUGHT (20 AUG 2013)

Reference

Albert, K.R., Boesgaard, K., Ro-Poulsen, H., Mikkelsen, T.N., Andersen, S. and Pilegaard, K. 2013. Antagonism between elevated CO₂, nighttime warming, and summer drought reduces the robustness of PSII performance to freezing events. *Environmental and Experimental Botany*: 10.1016/j.envexpbot.2013.03.008.

Albert *et al.* (2013) write that "plant responses to predicted global warming, elevated CO₂ and precipitation changes involve complex interactions of the factors," and, therefore, they say that "continued focus on the combined impact of factors is needed to understand the directional responses of ecosystem processes," citing, in this regard, the work of Beier *et al.* (2004), Rustad (2006), Heimann and Reichstein (2008) and Dieleman *et al.* (2012).

Working in a dry heathland ecosystem on sandy soil in North Zealand (Denmark), which was dominated by the evergreen dwarf shrub Common heather (*Calluna vulgaris* L.) and Wavy hairgrass (*Deschampsia flexuosa* L.), Albert *et al.* studied the effects of potential changes in three environmental factors and their combined impacts on photosystem II (PSII) performance during an autumn-to-winter period. These three factors were "elevated CO₂ (free-air carbon enrichment; CO₂), warming (passive nighttime warming; T) and summer drought (rain-excluding [curtains](#); D)."

The six Danish scientists report that "neither passive nighttime warming nor elevated CO₂ as single factors reduced PSII performance via incomplete cold hardening," in contradiction of what might have been expected based on the results of several prior studies. In fact, they say that "the passive nighttime warming strongly increased PSII performance, especially after freezing events; and when combined with elevated CO₂, a strongly skewed positive TxCO₂ interactive effect was seen," indicating, as they put it, that "these [plants](#) take advantage of the longer growing season induced by the warming in elevated CO₂ until a winter frost period becomes permanent."

However, they also found that if *previously* exposed to *summer* drought (D), the positive effect of TxCO₂ is immediately reduced after freezing events, "causing the full combination of DxTxCO₂ not to differ from control."

In a CO₂-enriched and warmer world of the future, the dry heathland ecosystem studied by Albert *et al.* should do *much better* than it does currently. And if significant summer droughts occur, it should do *no worse* than it does at the present time.

Additional References

Beier, C. 2004. Climate change and ecosystem function - full-scale manipulations of CO₂ and temperature. *New Phytologist* **162**: 243-245.

Dieleman, W.I.J., Vicca, S., Dijkstra, F.A., Hagedorn, F., Hovenden, M.J., Larsen, K.S., Morgan, J.A., Volder, A., Beier, C., Dukes, J.S., King, J., Leuzinger, S., Linder, S., Luo, Y., Oren, R., De Angelis, P., Tingey, D., Hoosbeek, M.R. and Janssens, I.A. 2012. Simple additive effects are rare: a quantitative review of plant biomass and soil process responses to combined manipulations of CO₂ and temperature. *Global Change Biology* **18**: 2681-2693.

Heimann, M. and Reichstein, M. 2008. Terrestrial ecosystem carbon dynamics and climate feedbacks. *Nature* **451**: 289-292.

Rustad, L.E. 2006. From transient to steady state response of ecosystems to atmospheric CO₂-enrichment and global climate change: conceptual challenges and need for an integrated research. *Plant Ecology* **182**: 43-62.

Archived 20 August 2013

D. CO₂ ENRICHMENT EFFECTS ON SOIL NITROGEN: POSITIVE OR NEGATIVE? (20 AUG 2013)

Reference

Mueller, K.E., Hobbie, S.E., Tilman, D. and Reich, P.B. 2013. Effects of plant diversity, N fertilization, and elevated [carbon dioxide](#) on grassland soil N cycling in a long-term experiment. *Global Change Biology* **19**: 1249-1261.

Mueller *et al.* (2013) begin their study by stating how *difficult* it is to predict how environmental changes will influence various ecosystem functions, partly because of the fact that "the duration of most relevant experiments, typically less than five years, is shorter than the timescale of some treatment plant-soil interactions," citing the studies of Fornara *et al.* (2009), Eisenhauer *et al.* (2011) and Reich *et al.* (2012). And, therefore, it can be appreciated that it can sometimes be next to impossible to *correctly* project what will occur over the course of many years, making such phenomena as the [progressive nitrogen limitation hypothesis](#) of Luo *et al.* (2004) highly controversial.

Against this backdrop, Mueller *et al.* measured soil nitrogen (N) transformations and dissolved inorganic N concentrations for *thirteen consecutive years* in the well-known BioCON grassland experiment conducted in Minnesota (USA), where atmospheric CO₂ concentration (ambient and ambient plus 180 ppm), herbaceous plant diversity (1, 4, 9 and 16 species), and two nitrogen fertilization treatments (unfertilized and fertilized with 4 g N m⁻² year⁻¹) were applied in a factorial design (Reich *et al.*, 2001).

Two major findings of the study were that (1) "plant species richness had increasingly positive effects on soil N transformations over time, likely because in diverse subplots the concentrations of N in roots increased over time," and because "species richness also had increasingly positive effects on concentrations of ammonium in soil, perhaps because more carbon accumulated in

soils of diverse subplots, providing exchange sites for ammonium," and that (2) "in contrast with existing hypotheses, such as progressive N limitation, and with observations from other, often shorter, studies, elevated CO₂ had relatively static and small, or insignificant, effects on soil inorganic N pools and fluxes."

Summarizing their work, in the words of the researchers who conducted the study, "during the first 13 years of the BioCON experiment, progressive N limitation was not induced through a negative effect of elevated CO₂ on net N mineralization," which is similar to what Reich and Hobbie (2013) also found to be the case. Hence, there is good *real-world experimental evidence* to suggest that the growth-enhancing effect of atmospheric CO₂ enrichment will *not* gradually wind down with the passage of time due to declining availability of soil nitrogen, in strong contradiction of what many climate alarmists have suggested.

Additional References

Eisenhauer, N., Milcu, A., Sabais, A.C.W., Bessler, H., Brenner, J., Engels, C., Klärner, B., Maraun, M., Partsch, S., Roscher, Schonert, F., Temperton, V.M., Thomisch, K., Weigelt, A., Weisser, W.W. and Scheu, S. 2011. Plant diversity surpasses plant functional groups and plant productivity as driver of soil biota in the long term. *PLOS ONE* **6**: 10.1371/journal.pone.0016055.

Fornara, D.A., Tilman, D. and Hobbie, S.E. 2009. Linkages between plant functional composition, fine root processes and potential soil N mineralization rates. *Journal of Ecology* **97**: 48-56.

Luo, Y., Su, B., Currie, W.S., Dukes, J.S., Finzi, A., Hartwig, U., Hungate, B., McMurtrie, R.E., Oren, R., Parton, W.J., Pataki, D.E., Shaw, M.R., Zak, D.R. and Field, C.B. 2004. Progressive nitrogen limitation of ecosystem responses to rising atmospheric carbon dioxide. *BioScience* **54**: 731-739.

Reich, P.B. and Hobbie, S.E. 2013. Decade-long soil nitrogen constraint on the CO₂ fertilization of plant biomass. *Nature Climate Change* **3**: 278-282.

Reich, P.B., Knops, J., Tilman, D., Craine, J., Ellsworth, D., Tjoelker, M., Lee, T., Wedin, D., Naeem, S., Bahaeddin, D., Hendrey, G., Jose, S., Wrage, K., Goth, J. and Bengtson, W. 2001. Plant diversity enhances ecosystem responses to elevated CO₂ and nitrogen deposition. *Nature* **410**: 809-812.

Reich, P.B., Tilman, D., Isbell, F., Mueller, K.E., Hobbie, S.E., Flynn, D. and Eisenhauer, N. 2012. Impacts of biodiversity loss escalate through time as redundancy fades. *Science* **336**: 589-592.

Archived 20 August 2013

E INVASIONS OF ALIEN PLANT SPECIES: SPURRED ON BY GLOBAL WARMING? (21 AUG 2013)

Reference

Konikow, L.F. 2011. Contribution of global groundwater depletion since 1900 to sea-level rise. *Geophysical Research Letters* **38**: 10.1029/2011GL048604.

In a paper recently published in *Plant Ecology*, Verlinden *et al.* (2013) note that "it is widely suggested that climate warming will increase the impact of biological invasions," yet they state that "studies on the combined effect of these two global changes [climate warming and biological invasions] are scarce." And, therefore, to help fill this real-world data void, they set

about to investigate the effect of an experimentally-induced temperature increase on mixes of highly-invasive alien plant species and their native competitors.

Utilizing six sunlit climate-controlled chambers at the University of Antwerp, the three Belgian researchers grew three species pairs of *alien-invasive/native-competitor plants* - (1) *Fallopia japonica/Cirsium arvense*, (2) *Solidago gigantea/Epilobium hirsutum*, and (3) *Senecio inaequidens/Plantago lanceolata* - either together or in isolation at ambient air temperature (T_A) or elevated air temperature ($T_E = T_A + 3^\circ\text{C}$), all of which treatments were supplied with equal amounts of water.

In the first two of these three sets of plants, *the native species dominated* when grown in mixture with the alien-invasive plants, while in the third pair the alien-invasive species dominated; and *warming did not modify the competitive balance in any of the three mixed pairs*. However, and most interestingly, Verlinden *et al.* report that, to their knowledge, in the only study to examine the combined effects of higher temperatures *and* simultaneously elevated atmospheric CO_2 concentrations on an *invasive/native* set of plants, the "positive effect of experimental warming on invader growth disappeared under elevated CO_2 concentrations," citing the work of Hely and Roxburgh (2005). And in another such study, Bradford *et al.* (2007) found that the elevated CO_2 treatment "did not modify the effects of the invasive species on [the] native plant assemblages."

Although the experimental results cited above deal with but a few sets of *alien-invasive/native-competitor* plants, they do seem to favor the native-competitor plants in the majority of situations that appear to have been studied, suggesting - *at a minimum* - that widely-expressed concerns about the possibility of CO_2 -induced global warming increasing the negative impacts of alien plant invasions has, *as yet*, no compelling basis in pertinent experimental studies.

Additional References

Bradford, M.A., Schumacher, H.B., Catovsky, S., Eggers, T., Newington, J.E. and Tordoff, G.M. 2007. Impacts of invasive plant species on riparian plant assemblages: interactions with elevated atmospheric [carbon dioxide](#) and nitrogen deposition. *Oecologia* **152**: 791-803.

Hely, S.E.L. and Roxburgh, S.H. 2005. The interactive effects of elevated CO_2 , temperature and initial size on growth and competition between a native C3 and an invasive C3 grass. *Plant Ecology* **177**: 85-98.

Verlinden, M., Van Kerkhove, A. and Nijs, I. 2013. Effects of experimental climate warming and associated soil drought on the competition between three highly invasive West European alien plant species and native counterparts. *Plant Ecology* **214**: 243-254.

Archived 21 August 2013

F. IMPACTS OF ATMOSPHERIC CO_2 ENRICHMENT ON SALT-STRESSED BARLEY (21 AUG 2013)

Reference

Perez-Lopez, U., Robredo, A., Miranda-Apodaca, J., Lacuesta, M., Muñoz-Rueda, A. and Mena-Petite, A. 2013. Carbon dioxide enrichment moderates salinity-induced effects on nitrogen acquisition and assimilation and their impact on growth in barley [plants](#). *Environmental and Experimental Botany* **87**: 148-158.

In the words of Perez-Lopez *et al.* (2013), "the ability of plants to acquire and assimilate nitrogen (N) is an important determinant of plant growth," and they say that many steps in this process "are affected under stressful environmental conditions such as drought and/or salinity."

To explore this complex subject in some detail, Perez-Lopez *et al.* grew well watered and fertilized barley (*Hordeum vulgare* L. cv. Iranis) plants from seed to maturity within a pair of controlled-environment chambers that were maintained at either ambient (350 ppm) or elevated (700 ppm) atmospheric CO₂ concentrations in 2.5-L pots containing a 3:1 mix of perlite and [vermiculite](#), during which time they measured a number of important plant properties and processes.

The six Spanish scientists report that "under ambient CO₂ conditions, 80, 160 and 240 mM NaCl reduced the total plant biomass by 12%, 30% and 44%, respectively," while "growth at elevated CO₂ levels led to 24%, 20% and 33% higher total biomass than under ambient CO₂ levels for 80, 160 and 240 mM NaCl, respectively," demonstrating that "the relative stimulation of total plant biomass in response to elevated CO₂ levels was higher in salt-stressed plants than in non-stressed ones." They attribute this phenomenon to the fact that "under mild salt stress, N metabolism was better maintained under elevated CO₂ levels than under ambient CO₂ levels, since nitrogen uptake rate, nitrogen translocation rate, photosynthetic nitrogen use efficiency, and nitrate reductase activity were less affected," all of which impacts resulted in "higher growth." "As a consequence of all these results," in the words of Perez-Lopez *et al.*, "barley plants subjected to elevated CO₂ levels will likely overcome mild saline conditions because of their capacity to maintain efficiency in N metabolism," which, of course, is good news for humanity.

Archived 21 August 2013

G. LIMITING SCIENTIFIC DEBATE: A CHANGE IN THE AGU POLICY ON PRESENTING ALTERNATIVE SCIENTIFIC VIEWPOINTS

Posted on [August 23, 2013](#) by [Guest Blogger](#)



Guest essay by **Roger A. Pielke Sr.**

In the August 20 2013 issue of EOS both the AGU Statement on Climate Change [<http://onlinelibrary.wiley.com/doi/10.1002/2013EO340006/pdf>] and my comment on the Statement [<http://onlinelibrary.wiley.com/doi/10.1002/2013EO340007/pdf>] were published. However, I was not permitted to publish my Minority Statement in EOS, but only refer to its URL on another website.

In this post, I want to share with you the policy announced by the AGU President, Carol Finn, in two e-mails to me. I extracted the text on this subject from her e-mails to me (which were also copied to others at the AGU, so that these e-mails should be considered open communications). <http://wattsupwiththat.com/2013/08/23/a-change-in-the-agu-policy-on-presenting-alternative-scientific-viewpoints/>

H. ARCTIC SEA ICE UPDATE: UNLIKELY TO BREAK RECORDS, BUT CONTINUING DOWNWARD TREND

The melting of sea ice in the Arctic is well on its way toward its annual “minimum,” that time when the floating ice cap covers less of the Arctic Ocean than at any other period during the year. While the ice will continue to shrink until around mid-September, it is unlikely that this year’s summer low will break a new record. Still, this year’s melt rates are in line with the sustained decline of the Arctic ice cover observed by NASA and other satellites over the last several decades.

“Even if this year ends up being the sixth- or seventh-lowest extent, what matters is that the 10 lowest extents recorded have happened during the last 10 years,” said Walt Meier, a glaciologist with NASA’s Goddard Space Flight Center in Greenbelt, Md. “The long-term trend is strongly downward.”

<https://www.youtube.com/watch?v=uiSuUe8dhZ0>

The icy cover of the Arctic Ocean was measured at 2.25 million square miles (5.83 million square kilometers) on Aug. 21. For comparison, the smallest Arctic sea ice extent on record for this date, recorded in 2012, was 1.67 million square miles (4.34 million square kilometers), and the largest recorded for this date was in 1996, when ice covered 3.16 millions square miles (8.2 million square kilometers) of the Arctic Ocean.

<http://wattsupwiththat.com/2013/08/23/nasa-says-arctic-sea-ice-unlikely-to-break-records-in-2013/#more-92223>

I. THE MEDIEVAL WARM PERIOD IN THE ARCTIC

Posted on August 23, 2013 by Guest Blogger

Since the IPCC AR5 is again making news in talking about the Medieval Warm Period, this review from Craig Idso at CO2Science.org seems appropriate. -Anthony

Medieval Warm Period (Arctic) — Summary

This review begins with the [study](#) of [Dahl-Jensen et al. \(1998\)](#), who used temperature measurements from two Greenland Ice Sheet boreholes to reconstruct the temperature history of this portion of the earth over the past 50,000 years. Their data indicated that after the termination of the glacial period, temperatures steadily rose to a maximum of 2.5°C warmer than at present during the Holocene Climatic Optimum (4,000 to 7,000 years ago). The Medieval Warm Period (MWP) and Little Ice Age (LIA) were also observed in the record, with temperatures 1°C warmer and 0.5-0.7°C cooler than at the time of their writing, respectively. After the Little Ice Age, they report that temperatures once again rose, but that they had “decreased during the last decades,” thereby indicating that the MWP in this part of the Arctic was *significantly* warmer than it was just before the turn of the century.

[Wagner and Melles \(2001\)](#) also worked on Greenland, where they extracted a 3.5-m-long sediment core from a lake (Raffels So) on an island (Raffles O) located just off Liverpool Land on the east coast of Greenland, which they analyzed for a number of properties related to the past presence of seabirds there, obtaining a 10,000-year record that tells much about the region’s climatic history. Key to the study were biogeochemical data, which, in the words of the two researchers, reflect “variations in seabird breeding colonies in the catchment which influence nutrient and cadmium supply to the lake.”

These data revealed sharp increases in the values of the parameters they represented between about 1100 and 700 years before present (BP), indicative of the summer presence of significant numbers of seabirds during that “medieval warm period,” as [Wagner](#) and Melles described it, which had been preceded by a several-hundred-year period (the Dark Ages Cold Period) with little to no bird presence. And after that “medieval warm period,” their data suggested another absence of birds during what they called “a subsequent Little Ice Age,” which they said was “the coldest period since the early Holocene in East Greenland.”

<http://wattsupwiththat.com/2013/08/23/the-medieval-warm-period-in-the-arctic/>

J. 'UNCERTAIN' SCIENCE: JUDITH CURRY'S TAKE ON CLIMATE CHANGE

When Republicans on Capitol Hill want to hear reasons not to take strong action on climate change, sometimes they call on Judith Curry to testify. The climatologist has staked out an unusual position on the subject: She says the climate is changing and people are partly responsible, but we shouldn't bother regulating carbon dioxide.

<http://www.capradio.org/news/npr/story?storyid=213894792>

Posted on [August 22, 2013](#) by [Anthony Watts](#)

From the [Helmholtz Centre for Ocean Research Kiel \(GEOMAR\)](#)

The potential for successful climate predictions

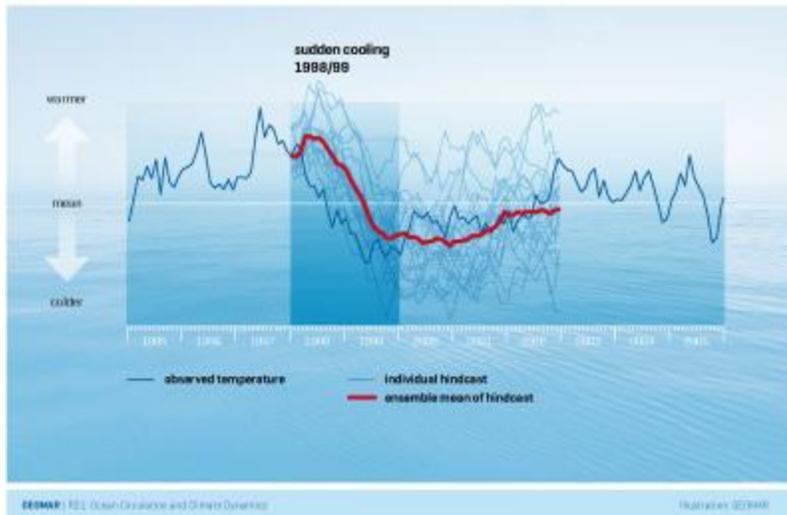
Hindcast experiments capture long-term climate fluctuations

(See graph below)

This shows observed and predicted temperature changes in the Pacific during the 90s. Credit: Graphics: C. Kersten, GEOMAR.

Will there be rather warm or cold winters in Germany in the coming years? We may have a long way to go before reliable forecasts of this kind can be achieved. However, marine scientists, under the auspices of the GEOMAR Helmholtz Centre for Ocean Research Kiel, recently managed to successfully hindcast climate shifts in the Pacific. These shifts also have a profound effect on the average global surface air temperature of the Earth. The most recent shift in the 1990s is one of the reasons that the Earth's temperature has not risen further since 1998. The study, published in the online edition of *Journal of Climate*, shows the potential for long-term climate predictions.

Reconstruction of abrupt climate shifts in the Pacific



<http://wattsupwiththat.com/2013/08/22/hindcasting-climate-shifts-in-the-pacific/#more-92126>

L. SEPARATING SCIENCE FROM SPIN ON THE GLOBAL-WARMING 'PAUSE'

What's causing a temporary slowdown in planetary warming, and why should anyone worry that more warming is coming?

By Patrick Reis and Marina Koren

August 21, 2013 | 2:40 p.m.



Volcanic eruptions, such as this one of Mount Rinjani in Indonesia, are fueling a "pause" in global warming. (Oliver Spalt)

"If the planet is warming, why have temperatures been steady for a decade?"

That question is now the go-to counterpoint for global-warming skeptics, and it has long been a sticking point for scientists as they try to explain their climate conclusions to an increasingly polarized public.

The debate was reborn anew last week when a leaked draft of the United Nations' [Intergovernmental Panel on Climate Change](#) upcoming report conceded that warming has largely paused over the past decade, prompting outcry from skeptics and leading conservative news outlets (including [Fox News](#)) to play up the pause in their reporting.

Climate scientists largely agree that warming has paused over the past decade (especially in measurements of surface temperature), but they say that break is temporary, and the near-[consensus on human-caused global warming remains unbroken](#).

"There has been a slowdown or hiatus in the rate of change of global temperature in the 21st century, and that's real," says David Gutzler, an earth- and planetary-sciences professor at the [University](#) of New Mexico who contributed to the IPCC report. "Most of us think that this is probably a temporary hiatus as opposed to a cessation of global warming."

<http://www.nationaljournal.com/energy/separating-science-from-spin-on-the-global-warming-pause-20130821>

M. REVISITING WOOD'S 1909 GREENHOUSE BOX

EXPERIMENT: PART I

August 23rd, 2013

Much is made in some circles of R.W. Wood's 1909 experiment which supposedly "disproved" the "greenhouse effect". As we shall see (below) the experiment reported on in the literature has only cursory detail. It also raises questions over the ability of the setup to demonstrate anything of use to the issue of whether downward IR emission from the sky raises the average surface temperature of the Earth.

Roy Spencer

<http://www.drroyspencer.com/>

N. REVISITING WOOD'S 1909 GREENHOUSE BOX

EXPERIMENT, PART II: FIRST RESULTS

August 26th, 2013 by Roy W. Spencer, Ph. D.

In [Part I](#) of this series, I mentioned how Wood's (1909) "greenhouse box" experiment, which he claimed suggested that a real greenhouse did not operate through "trapping" of infrared radiation, was probably not described well enough to conclude anything of substance. I provided Wood's original published "Note", which was only a few paragraphs, and in which he admitted that he covered the issue in only cursory detail.

Wood's experiment was not described well enough to replicate. We have no idea how much sunlight was passed through his plate of rock salt-covered box versus the glass-covered box. We also don't know exactly how he placed another glass window over the rock salt window, which if it was very close at all, invalidated the whole experiment.

I also mentioned two more recent experiments which came to totally opposite conclusions: one showed a substantial temperature rise in a glass covered box versus one covered with an IR-transparent material, the other did not.

Here I'll present first results from my own backyard experiment. Ideally, one wants to have identical boxes in terms of their absorption of sunlight and resistance to conductive heat loss. We want to measure just the effects of IR-transparent and IR-opaque materials placed over the boxes on their energy budgets, as measured by a temperature difference of the air trapped within the boxes.

<http://www.drroyspencer.com/2013/08/revisiting-woods-1909-greenhouse-box-experiment-part-ii-first-results/>

P. NEW TELESCOPE BRINGS THE POWER OF HUBBLE DOWN TO EARTH

Posted on [August 24, 2013](#) by [Anthony Watts](#)

Using a new camera and a telescope mirror that vibrates a thousand times each second to counteract atmospheric flickering, astronomers have achieved image resolution capabilities that could see a baseball diamond on the moon

Astronomers at the University of Arizona, the Arcetri Observatory near Florence, Italy and the Carnegie Observatory have developed a new type of camera that allows scientists to take sharper images of the night sky than ever before.

The team has been developing this technology for more than 20 years at observatories in Arizona, most recently at the Large Binocular Telescope, or LBT, and has now deployed the latest version of these cameras in the high desert of Chile at the Magellan 6.5-meter telescope. "It was very exciting to see this new camera make the night sky look sharper than has ever before been possible," said UA astronomy professor Laird Close, the project's principal scientist. "We can, for the first time, make long-exposure images that resolve objects just 0.02 arcseconds across – the equivalent of a dime viewed from more than a hundred miles away. At that resolution, you could see a baseball diamond on the moon."

<http://wattsupwiththat.com/2013/08/24/new-telescope-brings-the-power-of-hubble-down-to-earth/#more-92313>

O. EXTREME WEATHER – A QUICK NOTE ABOUT PETERSON ET AL (2013)

Posted on [August 26, 2013](#) by [Bob Tisdale](#)

I haven't seen Peterson et al (2013) presented alone yet at [WattsUpWithThat](#). It was referred to in [Jim Steele's](#) excellent WUWT post [Fabricating Climate Doom – Part 3: Extreme Weather Extinctions Enron Style](#).

A who's who of climatologists, including department heads, from numerous organizations around the United States contributed to Peterson et al (2013) [Monitoring and Understanding Changes in Heat Waves, Cold Waves, Floods, and Droughts in the United States: State of Knowledge](#). Full paper [here](#).

(<http://journals.ametsoc.org/doi/pdf/10.1175/BAMS-D-12-00066.1>)

<http://wattsupwiththat.com/2013/08/26/extreme-weather-a-quick-note-about-peterson-et-al-2013/#more-92408>

P. ON THE CLOUD THERMOSTAT HYPOTHESIS

August 22nd, 2013

Over 20 years ago, Ramanathan and Collins (1991 *Nature*, “RC91”) advanced what became known as the “Thermostat Hypothesis”, relating to how cloud formation over the tropical Pacific warm pool limits just how warm surface waters there can get. While this conceptual view was OK for the warm pool itself, they made some extrapolations which weren’t really warranted about what this meant for the larger-scale climate system, and ultimately whether “global warming” will be reduced by a resulting increase in cloud cover reflecting more sunlight back to space (negative cloud feedback).

<http://www.drroyspencer.com/>

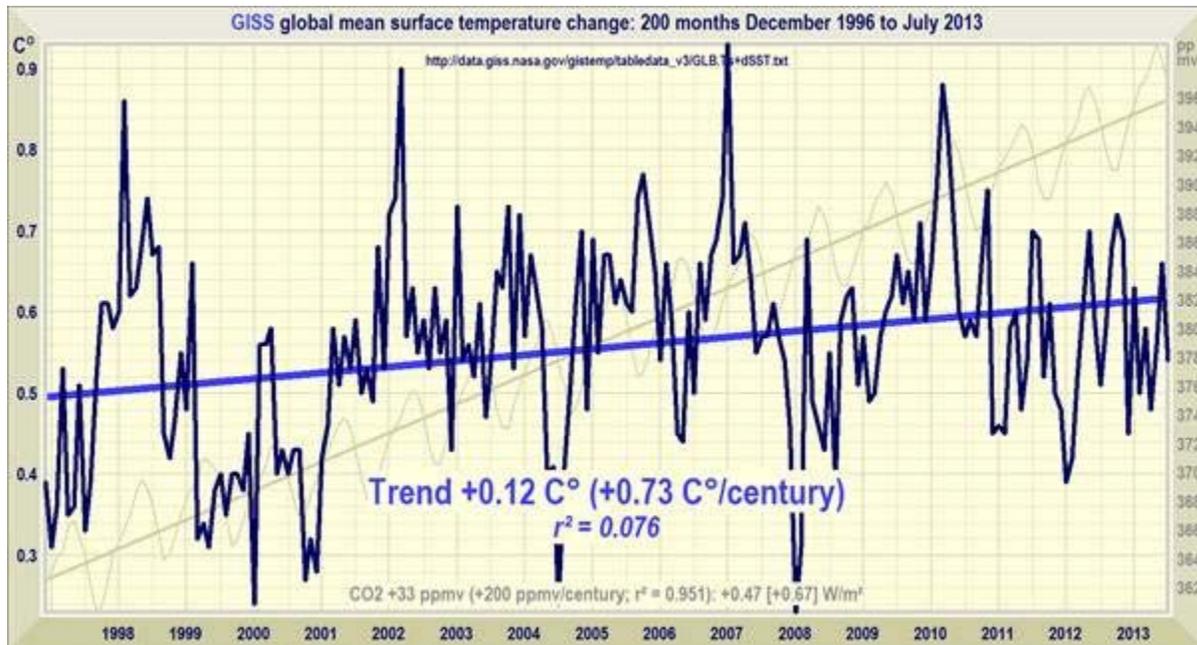
Q. THE 200 MONTHS OF ‘THE PAUSE’

Posted on August 27, 2013 by Anthony Watts

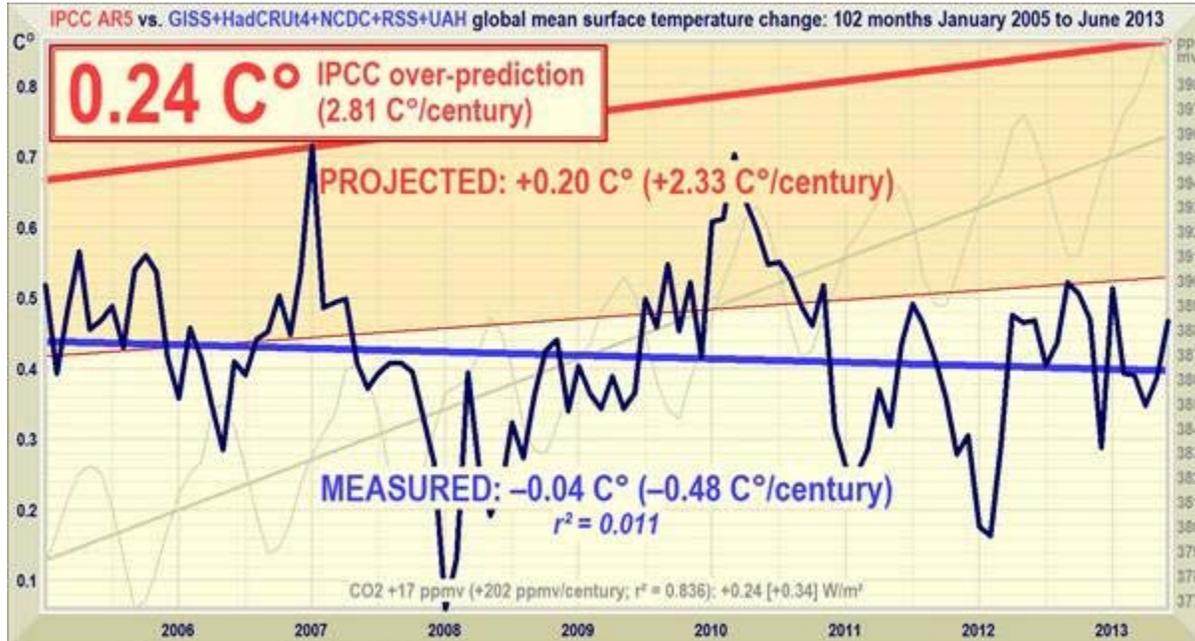
By Christopher Monckton of Brenchley

A commenter on my post mentioning that according to the [RSS satellite monthly global mean surface temperature dataset there has been no global warming at all for 200 months](#) complains that I have cherry-picked my dataset. So let’s pick all the cherries. Here are graphs for all five global datasets since December 1996.

GISS:



Mean of all five datasets:



So let us have no more wriggling and squirming, squeaking and shrieking from the [paid](#) trolls. The world is not warming anything like as fast as the models and the IPCC have predicted. The predictions have failed. They are wrong. Get over it.

Does this growing gap between prediction and reality mean global warming will never resume? Not necessarily. But it is rightly leading many of those who had previously demanded obeisance to the models to think again.

<http://wattsupwiththat.com/2013/08/27/the-200-months-of-the-pause/>

Regards
George