



June 23, 2009

## **Alabama climatologist responds to U.S. government report on regional impacts of global climate change**

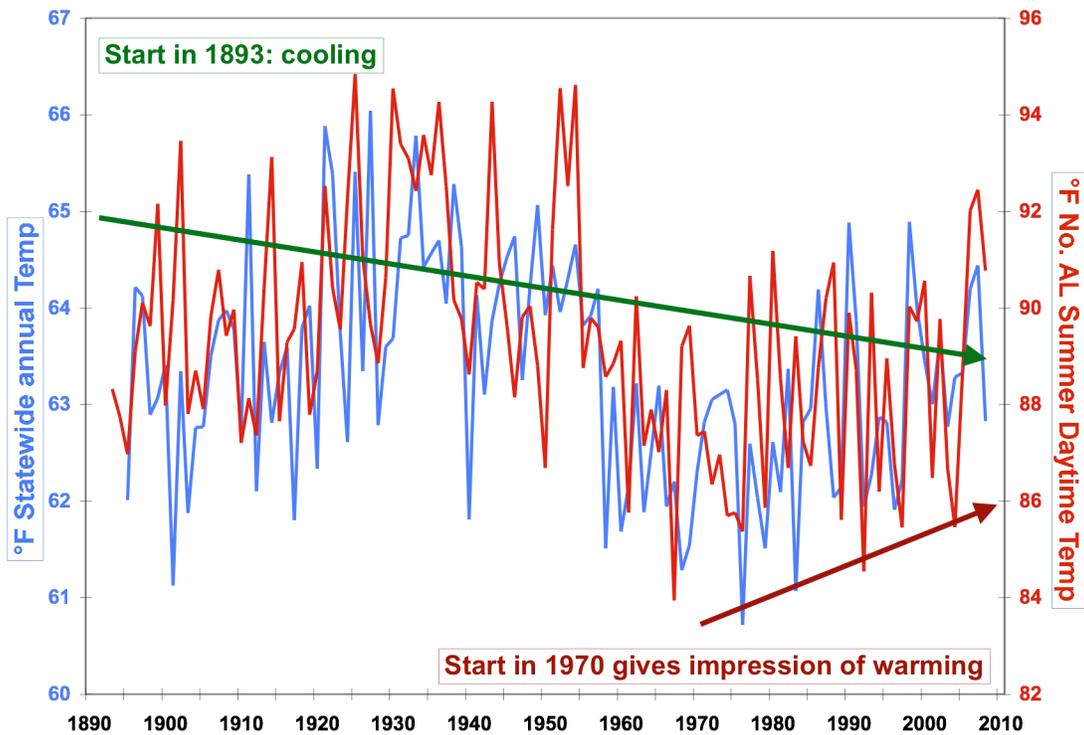
On Tuesday, June 16, the U.S. Global Change Research Program issued a report on aspects of climate change and predictions for the future for the U.S. as a whole and by regions. To those without an understanding of Alabama's climate history, the report leaves the impression that we in the Southeast are seeing unprecedented climate events caused by our greenhouse gas emissions.

As Alabama's state climatologist and as a scientist who builds and publishes climate data records from scratch for Alabama and the globe, I want to provide information which places our current climate in the context of the past. This is possible because many Alabama citizens began recording weather information in a systematic way as far back as the mid-1800s. These data are key to knowing the long-term picture of our climate.

One fundamental problem with the report concerning our region is its consistent use of the time period beginning around 1970 to imply that any climate changes since 1970 are a result of human influences. Six times in the text (and in two figures) of the six-page summary of the SE U.S. we see references to "... since 1970" or similar starting points.

Why would the authors concentrate on such a short time period for their study? Reliable temperature and rainfall data for the U.S. goes back to the 1800s. Why start around 1970? As it turns out, there isn't much of a story to tell when one sees the long-term picture as we shall see.

Here are facts that all Alabamians will understand. First the temperature record:

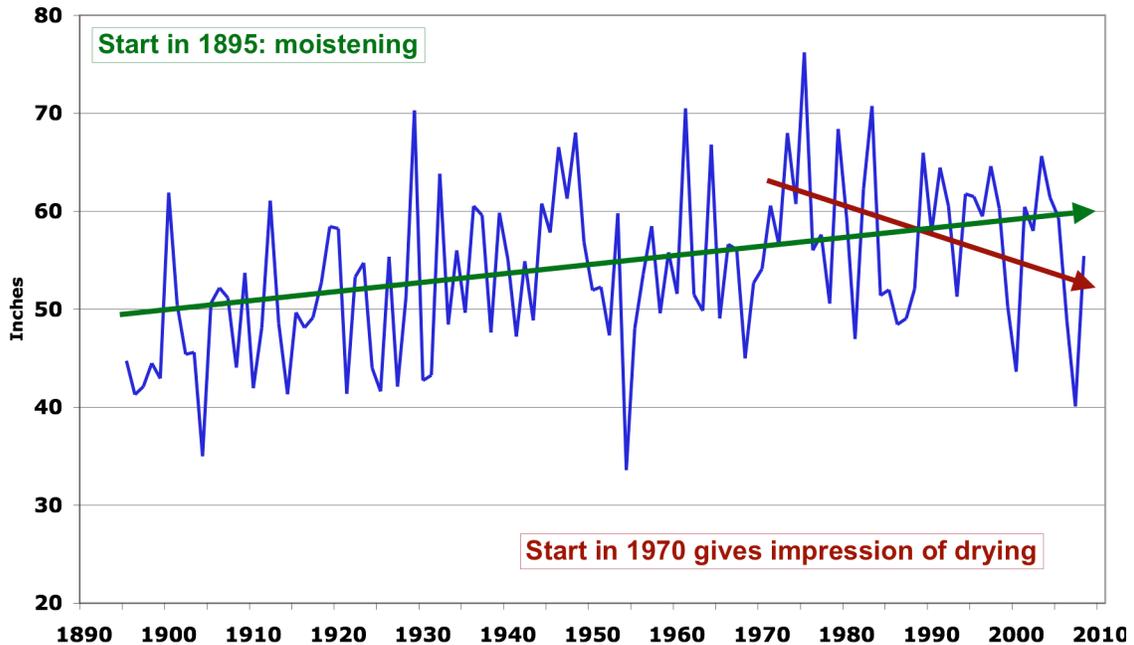


## TEMPERATURE TRENDS

Alabama has seen its temperature rise and fall from decade to decade since measurements began in the 1800s. No one has been able to predict these fluctuations or determine why they occur. The blue line is the statewide average temperature and the red is a recently constructed dataset showing summer daytime temperatures in North Alabama (note the scales are different). Both show the same pattern.

If your intent is to promote the idea that the climate is warming you would focus on the period starting around 1970, the coldest of the last 115 years, and ignore the rest. If your intent is to inform the public on climate variations, you would show the entire record. The 30 years from 1925 to 1954 were, in fact, extremely warm in Alabama, reaching levels not seen before or since. The bottom line on temperatures is that the state has not experienced overall warming, despite attempts to promote such an idea by starting in 1970.

## Alabama Annual Rainfall



### DROUGHT

The GCRP report says, "... spring and summer drought has increased ... since the mid-1970s." Above is the long record of rainfall in Alabama. One can see the same principle operating here as with the government's temperature story. While the long-term rainfall trend is positive (about 2 percent per decade), by starting at the wettest point in the graph in the mid 1970s, one sees a short period of declining rainfall.

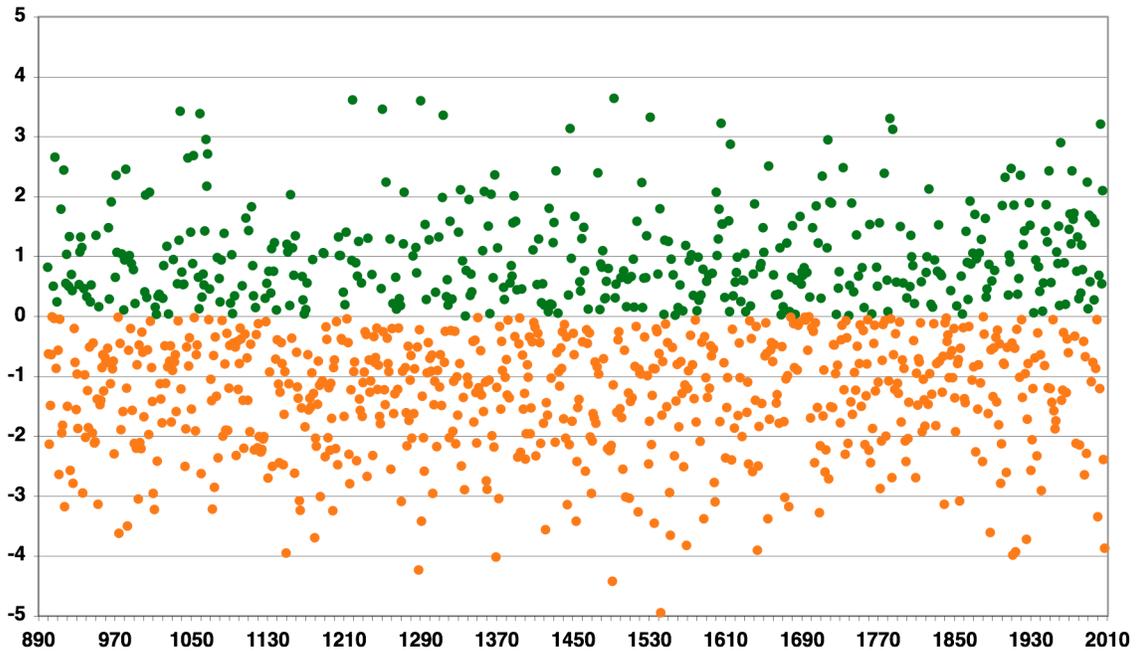
Why focus only on these last 30 years?

The answer should be obvious if the intent is to promote an impression that Alabama is warming up and drying out. By the way, both Spring and Summer rainfall have increased about 1.9% per decade since 1895 in Alabama. It is worth noting that while rainfall has decreased during the past three decades, Alabama was still on average wetter in the past 30 years than the period between the mid-1890s and the mid-1920s.

These two figures indicate that when records like these have so much variability, it is not difficult to extract from them an apparent rise or fall depending on starting point and which stations you choose. When all of the data from the entire state is considered, Alabama is not warming up or drying out; indeed the overall trends show a state that is becoming cooler and wetter.

## Summer Moisture AL State Average 899-2007

Cook and Heim

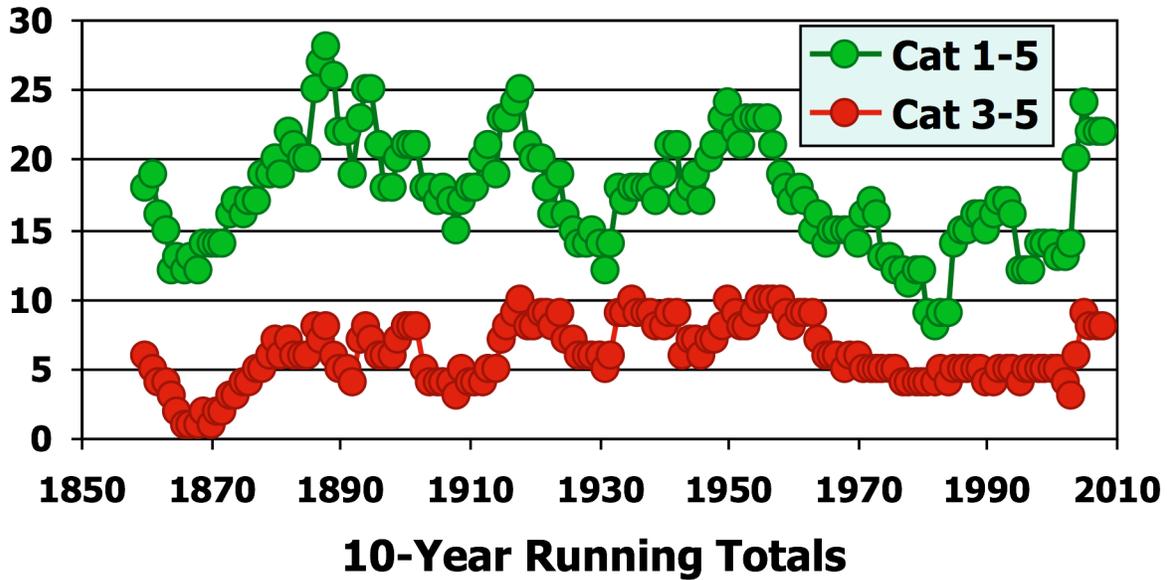


A longer record of summer drought has been developed using tree rings. Here we see no long-term rainfall trends over the past millennium in Alabama. In this record 2007 stands out as a very dry summer (9<sup>th</sup> driest overall), but of the magnitude that occurs about once every 100 years. In some parts of Alabama, 2007 was indeed the “100-year” drought. When it comes to a “thousand-year drought,” however, 1542 easily holds the record for the driest summer in last 1,100 years – without any possible human influence from greenhouse gases.

It is important to note that Alabama’s rainfall can vary considerably from year to year and decade to decade. Water resource planning is an important area for the state to address to deal with these variations. From 1121 to 1126, for example, Alabama experienced six consecutive years of serious drought. If nature repeats that event, will we be ready?

Dealing with the issue at hand, however, I see no evidence to support the assertion that Alabama’s climate is getting drier overall or that the frequency of droughts is increasing.

## U.S. Hurricane Strikes by Decade (NOAA 2008)



### HURRICANES

The statement that hurricanes are becoming worse (“... the intensity of Atlantic hurricanes is likely to increase ... with higher peak wind speeds, rainfall intensity and storm surge ...”) is not borne out in the data. Many of my colleagues are especially upset about the hurricane storyline in this federal report. One hurricane specialist, Dr. Stanley Goldenberg of NOAA’s Hurricane Research Center, said, “... [I] disagree strongly with the hurricane-related conclusions of this report!” Another, Dr. Roger Pielke, Jr., of the University of Colorado, stated that his hurricane-disaster research had been “misrepresented.”

For example, in the section on the SE the report includes a plot showing rising sea water temperatures in the Atlantic since 1900, implying that this will continue and cause more frequent and intense hurricanes for the Gulf of Mexico. However, the report did not include a plot of the actual hurricane landfalls during the period of rising ocean temperatures in this section, a plot which would have shown no long term changes (see above).

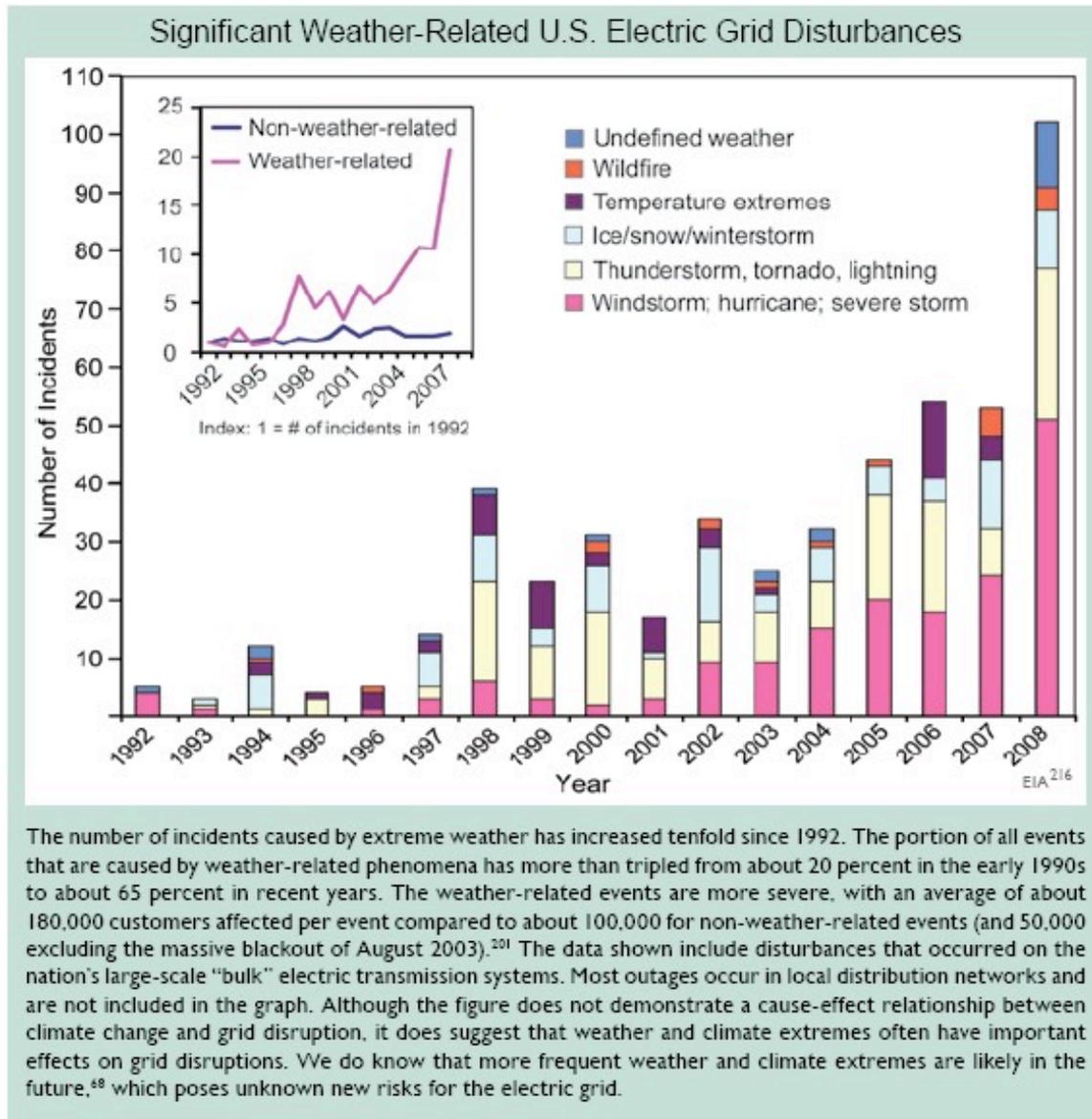
Much earlier in the report, on pg 35, there is a discussion which includes a shorter record of hurricane landfalls. The authors try to convince the reader that more intense hurricanes are coming, focusing (again) only on the changes in the period since the mid-1970s. This subject has been the source of considerable debate in the scientific community, but the evidence shows no significant long-term changes in the frequency and intensity of these storms.

Be that as it may, hurricanes still cause terrible damage on our Gulf Coast – and they will continue to do so as the population grows in these vulnerable areas. But the hard data show that the number and intensity of hurricanes are

not increasing ... however, I hope our *respect* for hurricanes and their destructive power will increase.

## ELECTRICAL GRID DISTURBANCES

A final example of the improper use of information in the report is shown below. The reader, looking at this chart, would assume that an implied increase in severe weather events (due to human-induced climate change) has caused a ten-fold increase in electrical outages in the past 17 years.



From the report (pg 57-58):

The electricity grid is also vulnerable to climate change effects, from temperature changes to severe weather events ... The number of [U.S. electrical grid disturbance] incidents caused by extreme weather has increased tenfold since 1992. The portion of all events that are caused by weather-related phenomena has more than tripled from about 20 percent in the early 1990s to about 65 percent in recent years. The weather-related events are more severe, with an average of about 180,000 customers affected per event compared to about 100,000 for non-weather-related events (and 50,000 excluding the massive blackout of August 2003).

When contacted about this chart by Warren Meyer (<http://www.climate-skeptic.com/2009/06/update-on-gcci-post-4-grid-outage-chart.html>), John Makins, the keeper of the data for the Energy Information Administration, simply said that when he came on board in 1997, a strong push to regularize the acquisition of the data began. Thus, the reason there is a rise of disturbances has little to do with climate change and is more clearly related to a more aggressive reporting procedure. Once again, this demonstrates that the report falls far short of providing unbiased information on climate change and its impacts.

## **CONCLUSIONS**

The fundamental argument being asserted by the GCRP report is that while the climate is always changing due to many natural forces, the current climate change is caused not by nature but largely by human consumption of energy through the burning of coal, oil, natural gas and other carbon-based fuels.

There is a “climate change” bill now being considered by Congress. I believe its supporters hope to improve the bill’s odds of passage by publishing reports that suggest in the strongest terms that our climate is rapidly deteriorating due to human activities. Many climate scientists, including me, reviewed an earlier draft last year and found numerous misrepresentations of the science. Our objections were largely ignored. The report cannot be viewed as an unbiased synopsis of climate science. Alabamians need to be aware of what the climate is really doing and inform themselves of these legislative actions, which could have an impact on every aspect of our lives.

The rest of the report on the Southeastern climate deals with speculation about our future climate, pointing out many potentially disturbing changes (hotter, drier, more hurricanes, etc.).

We have tested the ten “best” climate models as they tried to reproduce the climate of the past century for the SE and found none that were able to reproduce the actual trends (i.e. declining temperatures and increasing

rainfall.)

Based on our studies, my view is that climate models are at such an early stage of development that they are not ready to be used as sources of predictive information in which we can place significant confidence, especially for regions like the Southeast.

When we examine the full record of our state's climate we see that the recent changes implied by the federal report are not happening in the long run in Alabama. If there has been no real climate change in our state other than normal ups and downs, why should we believe that the government's predictions for the climate of other regions will be more accurate or reliable? As Alabama's state climatologist, I would be very interested in the answer to that question.