

Hurricanes and CO₂ rise – An Unsolicited Editorial

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It is now over a year-and-a-half since the media explosion following hurricanes Katrina and Rita's landfalls and several papers saying that the US landfalling hurricanes of 2004-2005 probably had a human-induced global warming component. With this there was an implication that US hurricane landfall and damage would continue to get worse with time as CO₂ amounts continued to rise.

I immediately commented that these recent papers and subsequent media comments were significantly flawed. Since then many of you have come forth to point out numerous problems with accepting that global or Atlantic hurricane activity is getting more active or more intense than what has been experienced in the past. I have been pleased by your many responses and comments to refute these papers.

Given the many open-ocean data problems, the most reliable long-period hurricane records we have are the measurements of US landfalling tropical cyclones since 1900 (Table 1). Although global mean CO₂ and Atlantic surface temperatures have increased between the two 50-year periods (1900-1949 compared with 1956-2005), the frequency of US landfall numbers actually shows a slight downward trend for the later period. If we chose to make a similar comparison between US landfall from the earlier 30 years of 1900-1929 when global mean surface temperatures were estimated to be about 0.4°C colder than they have been during the last 30 years (1976-2005) we find exactly the same US hurricane landfall numbers (54 to 54) and major hurricane landfall numbers (21 to 21). CO₂ arguments would specify an upward trend.

It is also to be noted that there were 39 US landfalling major hurricanes (Cat 3-4-5) between 1925-1965 and only 22 in the same length period between 1966-2006 when CO₂ amounts were getting higher. It has been estimated that landfalling major hurricanes account for about 80-85 percent of all long period normalized US destruction. This implies that normalized hurricane destruction has been going downward as CO₂ gases increase.

The increased Atlantic hurricane activity since 1995 is a result of a speed-up of the Atlantic thermohaline circulation – as occurred also in the 1940s-1950s and the late 19th century. I and a number of my colleagues have been discussing the physics of this multi-decadal Atlantic Ocean thermohaline circulation (THC or Atlantic multi-decadal oscillation – AMO) variation in our forecasts and other venues for many years. We hypothesize it to be driven by Atlantic salinity variations. The advocates of CO₂ are either unaware or unaccepting of this plausible explanation.

The large increase in US hurricane-spawned destruction of the 2004-2005 hurricane seasons has not surprised me or several of my colleagues. We have been anticipating a great upsurge in US hurricane destruction for many years based on an expected shift of

the THC, not increased human-induced greenhouse gases. Here is a sample of various comments we have made in our seasonal forecasts:

April 1989: "... major increases in hurricane-spawned coastal destruction is inevitable."

June 1997: "... we will begin to see a large upturn in hurricane-spawned destruction – likely higher than anything previously experienced."

April 2001: "We must expect a great increase in landfalling major hurricanes in the coming decades. With exploding southeast coastal populations, we should expect to see hurricane damage as never before experienced."

May 2002: "We should indeed see future hurricane damage much greater than anything in the past."

May 2003: "Regardless of whether a major hurricane makes landfall this year, it is inevitable that we will see hurricane-spawned destruction in coming years on a scale many, many times greater than what we have seen in the past."

It remains a mystery to me how experienced meteorologists can continue to imply that CO₂ increases are likely an important cause of Atlantic major hurricane increases since 1995.

Table 1. US Landfalling tropical cyclones by intensity during two 50-year periods.

<i>YEARS</i>	<i>Named Storms</i>	<i>Hurricanes</i>	<i>Intense Hurricanes (Cat 3-4-5)</i>	<i>Global Temperature Increase</i>
1900-1949 (50 years)	189	101	39	+0.4°C
1957-2006 (50 years)	165	83	34	

The CO₂ advocates recent comments concerning their continued allegiance to their flawed data is likely having an adverse affect on many of the decisions of the insurance industry, investment groups, business owners, local government officials, etc., besides causing unneeded alarm and worry among millions of coastal homeowners. *USA Today* conducted a national survey in which they found that 25 percent of responders believed that human-induced greenhouse gases were responsible for much of the damage from Katrina and Rita.

The fallacy of 'peer reviewed' papers as reliable evidence. Most peer reviewed papers get only 2-3 examiners, usually of like-mind of the author. Many papers are reviewed by

modelers with little observational experience. Such peer-reviewed papers as evidence of reality is often wrong. For instance, the development of a power dissipation index (PDI) which involves the cube of the wind speed. This is a poorly measured quantity especially over data deficient oceans. Saying that TC dissipation has doubled in recent years is likely a gross misstatement of reality. There is no way this calculation is supported by the observations.

Another example – a recent ‘peer reviewed’ paper that is to be published in a UK journal by two CO₂ advocates make the following statements with regards to North Atlantic hurricane activity:

“Overall, there has been a substantial 100-year trend leading to related increases of over 0.7°C in SST and over 100% in tropical cyclone and hurricane numbers. It is concluded that the overall trend in SSTs and tropical cyclone and hurricane numbers is substantially influenced by greenhouse warming ...”

“... the increasing cyclone numbers has lead to a distinct trend in the number of major hurricanes and one that is clearly associated with greenhouse warming.”

“But the combination of this oscillation with the increasing number of tropical cyclones also results in a strong trend in major hurricane numbers that is directly associated with greenhouse warming. These conclusions are robust to known errors in the available data.”

“... we are lead to the confident conclusion that the recent upsurge in tropical cyclone frequency is due in part to greenhouse warming and this is most likely the dominant effect. Earlier variations, such as the sharp increase in the 1930s, were also probably impacted by greenhouse influences ...”

It is likely that the media will get hold of this new ‘peer-reviewed’ paper and misinform the public as to the perils of CO₂ rise.

The global warming/increased hurricane activity advocates have tried (over the last 1½ years) to try to justify their erroneous data. Their arguments have (in my view) come to nothing. They have not convinced any of the experienced TC experts that I know about and respect. It amazes me that they have refused to back away from their earlier faulty analyses. We have an active seasonal hurricane forecast for 2007. I cringe at what the greenhouse gas advocates will say if we experience one to two damaging landfalls this year.

I further note that most of the greenhouse gas advocates are planning to go to the WMO “First International Conference on Global Warming and Hurricanes” to be held in Crete in early June of this year. They appear desirous of “institutionalizing” the global warming-hurricane topic for which there is no credible evidence.

KUDOS: Besides the noble efforts of Chris Landsea, Stan Goldenberg and Johnny Chan, three other individuals over the last 1½ years have impressed me with their unique talents and their efforts to try to uphold a modicum of reality on this topic. These three

special individuals are Karl Hoarau, Roger Pielke Sr. and Roger Pielke Jr. I congratulate all three of them on their efforts.