



**BRIEF ANALYSIS**

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## Hot Air vs. the Cold Hard Truth about Hurricanes and Global Warming

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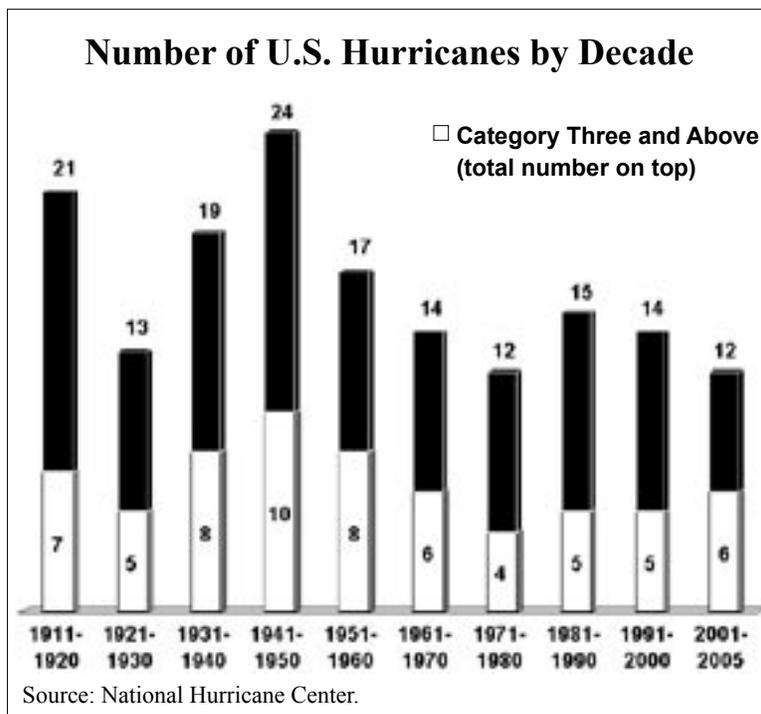
Environmental lobbyists quickly responded to the Gulf Coast devastation of hurricanes Katrina and Rita with loud assertions that the underlying cause of these more frequent, more dangerous and more costly hurricanes is global warming caused by human greenhouse gas emissions. There is just one problem: science. Historical data and ongoing hurricane research reveal scant evidence linking human-caused warming to more frequent or powerful hurricanes.

**Physics of Hurricanes.** Hurricanes only form at sea surface temperatures above 80° F, and ocean temperatures have increased modestly over the past 50 years. But ocean temperatures are only one factor in the formation, power and longevity of hurricanes. Hurricanes are heat engines: their longevity and severity are partly driven by temperature differences between the ocean water and the air temperature. The smaller the difference, the less severe the storm. Even if global warming modestly increases ocean temperatures in the coming century, the gap between ocean and air temperatures will shrink because there will be little or no increase in air temperatures nearest the equator, where hurricanes form.

According to scientists at the National Oceanic and Atmospheric Administration (NOAA), because the changes in both factors are likely to be small, neither the increased

ocean temperatures nor the reduced differential between the air and water temperatures are likely to result in any changes in hurricane frequency or intensity.

**Historical Data.** At the 27th Annual National Hurricane Conference, University of Colorado atmospheric scientist Dr. William Gray explained that natural, periodically changing ocean circulation patterns, not humans, are responsible for hurricane cycles. This, he said, includes the current worldwide cycle of increasing hurricane activity.



According to the National Hurricane Center:

■ The increasing number of Atlantic hurricanes during the last decade, including 2004's and 2005's above-average seasons, are part of a multi-decadal cycle scientists have monitored for nearly 150 years.

■ From the 1960s through the 1990s there was a relative lull in hurricane activity affecting the United States, with an average of fewer than 14 hurricanes per decade—five of which, per decade, were classified as Category Three or above (with wind

speeds of 111 miles per hour or more and ocean storm surges at least nine feet above normal). [See the figure.]

■ Around 1995, the lull gave way to a more active phase of the cycle, similar to the period from about 1930 through 1950. Indeed, in the 1940s, 24 hurricanes—10 of them Category Three or higher—hit the U.S. mainland.

This current increased hurricane activity is likely to last 10 to 20 more years.

**Hurricane Research.** In a paper recently published in the *Bulletin of the American Meteorological Society*

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titled “Hurricanes and Global Warming,” six noted tropical cyclone experts made three main points:

- The level of greenhouse gas emissions has not been linked to the observed behavior of hurricanes.
- There is a scientific consensus that any future changes in hurricane intensity will likely be small compared to observed natural variability.
- Attempts to link future hurricanes to global warming for political reasons threaten to undermine support for legitimate climate research and will lead to the implementation of ineffective policies to reduce the impact of hurricanes.

**The Politics of Global Warming.** The politicization of global warming has already caused problems. In the midst of 2004’s extremely busy hurricane season — when the landfall of four hurricanes in the United States caused billions of dollars’ worth of damage — Kevin Trenberth, a scientist on the Intergovernmental Panel on Climate Change (IPCC), and others linked the outbreaks of intense hurricanes to global warming at a Harvard University press conference.

Researcher Chris Landsea of NOAA resigned from the IPCC in January 2005. In a “Dear Colleague” letter, Landsea stated the IPCC had become too politicized in his area of expertise, climate and hurricanes. In particular, he cited Trenberth’s Harvard press conference, noting that none of the participants cited any new field research to support their claims. He also pointed out: “[T]he evidence is quite strong and supported by the most recent credible studies that any impact in the future from global warming upon hurricanes will likely be quite small.”

**Insuring Global Warming?** Environmentalists also cite insurance industry data on the rising costs of disasters to support their argument that global warming is causing ever-deadlier hurricanes. Insurance companies and reinsurers (the companies insuring the insurance industry) are understandably interested in any activity or public policy that could affect weather events, since extreme weather costs them money. Indeed, a recent study from the Association of British Insurers concludes it is likely climate change is already intensifying extreme weather patterns. If this trend continues, they estimate it could raise the cost to U.S. hurricane insurers by 75 percent — to between \$100 billion and \$150 billion — through 2080.

Munich Re, the world’s largest reinsurer, claims climate change is at least partly to blame. By Munich Re’s estimates:

- Insured disaster losses in 2004 totaled \$44 billion, the most expensive year for the industry.
- Including uninsured losses, disasters cost \$114.5 billion in 2004, the second-highest total.
- By contrast, the total cost of disasters, adjusted to 2004 values, was about \$40 billion in 1980 and \$10.5 billion in 1951.

While it is clear the losses from natural disasters are rising for insurers, property owners and governments, the National Climatic Data Center has argued these increased losses are due to changes in society, not climate fluctuations — in particular: the explosion of high-density development along our alluring but vulnerable beachfronts.

Coastal development has been substantial over the past half century, but in the last 20 years or so the pace has accelerated and its character shifted from the occasional, modest beach bungalow and motor lodge to whole strips of sand given over to luxury hotels, high-rise condominiums and multi-million dollar homes. As demand for beachfront property has grown, so has the value of remaining undeveloped parcels.

Furthermore, development has often come at the expense of coastal wetlands that would otherwise absorb some of the brunt of the storms and thus reduce the damage they cause. In addition, the roads and sewers associated with development have increased both the amount and the rapidity with which water flows into streams and bays — increasing the risk of flooding during minor storms, and even more so during hurricanes.

**Conclusion.** Hurricanes are a costly, and all too often deadly, natural phenomenon. Insurers, government officials and the public do not need to look for tenuous, arguably nonexistent links between human-caused global warming and hurricanes to explain why the number and costs of tropical storms have risen. More frequent, stronger hurricanes due to well-studied cyclical shifts in ocean currents, combined with increasing, more valuable coastal development is a bad combination. In the coming decade or two it will likely result in increasingly costly hurricane damage.

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