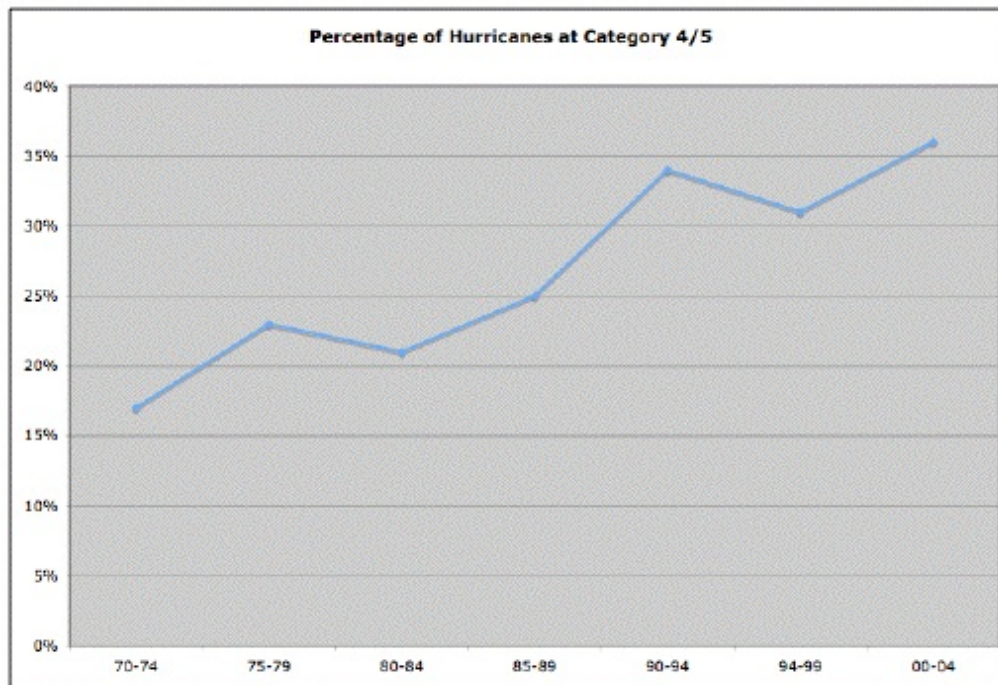




Global Warming is to Blame

Posted by [Stuart Staniford](#) on September 22, 2005 - 3:26am

Topic: [Environment/Sustainability](#)



Here is the worldwide proportion of hurricanes at Category 4-5 on the Saffir-Simpson Scale. If this isn't enough for you, check below the fold.

Technorati Tags: [peak oil](#), [oil](#), [Katrina](#), [Hurricane Rita](#), [Katrina](#), [Hurricane Rita](#), [gas prices](#)

Many hurricane experts seem to downplay the global warming link. For example [NOAA says in their FAQ](#) that even in a 2x CO2 world:

- Preliminary analyses hint that only small to no change in the NUMBER of tropical cyclones may occur, and that regionally there may be areas that have small increases or small decreases in frequency.
- The PEAK INTENSITY of tropical cyclones may increase by 5-10% in wind speeds, but this may be an overestimate because of simplifications in the calculations.
- Little is known as to how the AVERAGE INTENSITY or SIZE of tropical cyclones may change due to global warming.
- Overall, these suggested changes are quite small compared to the observed large natural variability of hurricanes, typhoons and tropical cyclones. However, more study is needed to better understand the complex interaction between these storms and the

tropical atmosphere/ocean.

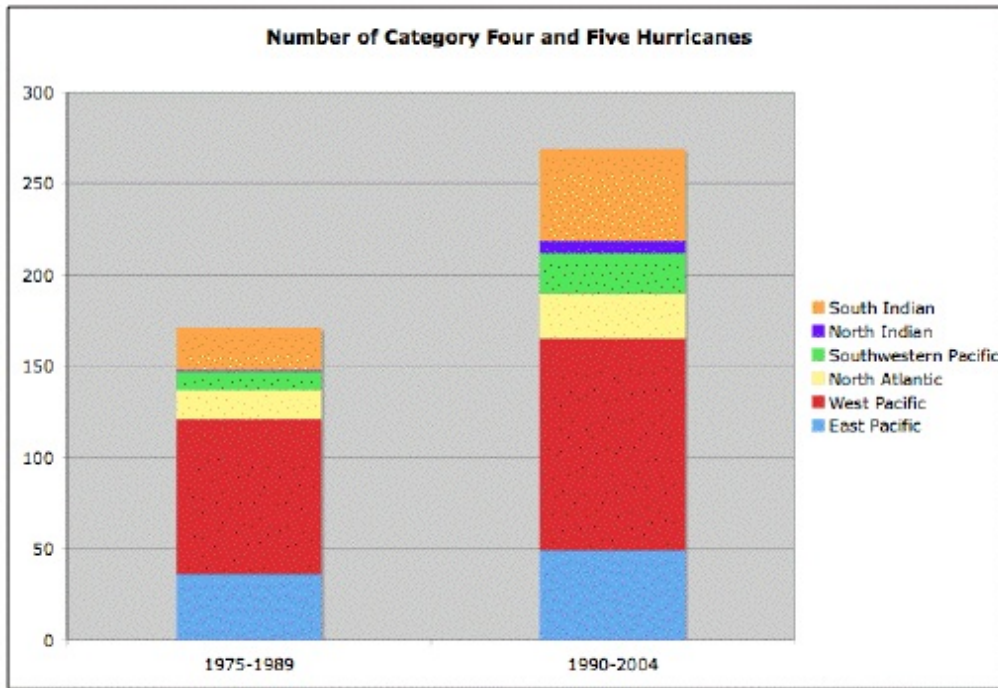
Still, the events of the last two years seem so off the scale of previous experience that I wanted to delve further.

Happily for my work and sleep, the analysis I had thought to do has already been done. Of course, there has been a lot of discussion of the [Emanuel paper](#) which says

Theory and modelling predict that hurricane intensity should increase with increasing global mean temperatures, but work on the detection of trends in hurricane activity has focused mostly on their frequency and shows no trend. Here I define an index of the potential destructiveness of hurricanes based on the total dissipation of power, integrated over the lifetime of the cyclone, and show that this index has increased markedly since the mid-1970s. This trend is due to both longer storm lifetimes and greater storm intensities. I find that the record of net hurricane power dissipation is highly correlated with tropical sea surface temperature, reflecting well-documented climate signals, including multi-decadal oscillations in the North Atlantic and North Pacific, and global warming. My results suggest that future warming may lead to an upward trend in tropical cyclone destructive potential, and -- taking into account an increasing coastal population -- a substantial increase in hurricane-related losses in the twenty-first century.

However, I actually found the analysis by [Weaver et al](#) simpler and even more persuasive. Weaver looks at a number of things including the number of storm days (no real trend) and the number of storms (no real trend). But he does what I wanted to do which is ask: "Are there more category four and five hurricanes now?" **Yes, by a mile.** The proportion of hurricanes which are category four or above has increased from about 16% in 1970-74, to around 36% in 2000-2004. It's **doubled!** The trend is really clear in his Figure 4 which I reproduce above the fold. Also, the absolute number of Cat 4/5 storms has doubled over the same period.

Not only that, but the trend is there in **every one of six hurricane basins**. Here's the data comparing the 1975-1989 period with the 1990-2004 period.



(Note that this ignores the South Atlantic, which got its [first ever hurricane](#) last year). Steven Stoft has done a [statistical analysis](#) of this data, and shows that if the hurricane basins were behaving independently, the odds that all of them would have increased like this were less than 1 in 1000.

It's not that there are more hurricanes. It's not that there are more hurricane days. It's that more of the hurricanes are category 4 and 5. Everywhere. So either,

1. Global warming is leading to an increase in the most intense hurricanes (in addition to melting all the glaciers and the North pole),
2. An unknown global factor is leading to more devastating hurricanes everywhere.

Occam's Razor says:

One should not increase, beyond what is necessary, the number of entities required to explain anything

That says hypothesis 1) should be the world's working hypothesis until disproven.

Not only that, I think we can stop all the pussyfooting in the press about how no individual storm can be attributed to global warming. Ok, we can't attribute Katrina to global warming. Ok, we can't attribute Rita to global warming. But I think there's a pretty decent argument to be made that two category five hurricanes in the Gulf of Mexico, back-to-back, inside a month, is not something that would have happened if global warming had not doubled the incidence of category 4 and 5 storms.

Given that global warming appears to be causing probably irreversible runaway changes like [melting the permafrost](#), I think the only question now is how long it is before we need to add a Category 6 to the scale.

Welcome to the twenty-first century.



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