

The reality of 20th century hurricane increases.

Recently, there has been a lot written about changes in hurricane frequency and how these changes may be an indicator of climate change. Yet another study has been released indicating that human activity may be partly responsible for the rise in hurricane activity over the course of the 20th century. The latest is a study entitled, "Heightened Tropical Cyclone Activity in the North Atlantic: Natural Variability or Climate Trend?", and published in the Philosophical Transactions of the Royal Society of London

The active seasons of 2004 and 2005 have had interested parties on both sides of the global warming debate paying inordinate attention to the forecasts for the 2006 season and again for the 2007 season. While it is still a bit early to comment on the 2007 season, as we're still headed toward the most active time of the year in the Atlantic, the prediction of an active 2006 hurricane season was a bust.

The study cited above demonstrates that Atlantic hurricane activity has risen through the course of the 20th century and that this rise has occurred following rises in sea surface temperatures (SST's). The authors, G. J. Holland and P. J. Webster, found that hurricane activity increased substantially around 1930 and that the years since 1995 have been the most active since 1900. They are also concerned that the hurricane numbers in the present period have not stabilized yet and that further rises are likely.

However, there are a few problems with the conclusions of the authors. The first and most important is that observation practices have changed radically since the 1900 – 1930 period. Today we have satellites watching over the oceans for hurricane formation. Also, in the most recent decades, the National Hurricane Center has named hurricanes and tropical storms, but also what they call "subtropical storms". These storms are hybrids which have many characteristics of both tropical storms and non-tropical storms. Satellite records have also allowed us to go back and "pick-up" storms that may have been missed previously and add them to the record. Naturally, there should be more tropical storms in the last few years than in the period before 1930.

The authors' study finds that the ratio of hurricanes to tropical storms has not changed substantially since 1930 (approximately 1 to 1). Before 1930, they found the ratio was about two hurricanes to one tropical storm. Assuming that storms were likely missed in the 1900 – 1930 period and that the 1900 – 1930 ratio was probably closer to 1 to 1, then the average occurrence of tropical cyclones from 1900 – 1930 was likely closer to eight (possibly more) rather than the six cited by the authors.

The problem described in the two paragraphs previous is akin to the change in tornado frequencies since 1900. During the 1920's, the US averaged roughly 100 tornadoes per year, while during the last few decades, the mean has been closer to 1200. No one would argue that this 10-fold increase in tornado counts is due, even in part, to climate change.

Thus, if one discards the hurricane data before 1944 (as suggested by Dr. Chris Landsea-National Hurricane Center expert), which is the date that aircraft observation of these storms began in earnest, one is hard pressed to find an increase in hurricane activity that is substantial enough to discount the changes in observation practices as a substantial cause of the increase. Several studies have found increases in hurricane activity since then, but not enough to attribute to climate change.

Additionally, the authors find that the rise in hurricane activity does not correlate strongly to natural cycles. This argument also deserves comment. Dr. Bill Gray, a hurricane expert at

Colorado State University has found compelling evidence relating hurricane frequencies to the increases and decreases in the intensity of the thermohaline circulation. In short, these changes in the thermohaline circulation manifest themselves in the hurricane climatology by how they impact the strength and frequency of the El Nino. The occurrence of El Nino has been linked strongly to Atlantic hurricane activity, and this is a problem our research group, and others such as Dr. Landsea and his colleagues, has examined.

Finally, if the authors are serious about relating hurricane frequency changes to climate change, they need to demonstrate that changes in the tropical atmosphere have also made hurricane occurrence more favorable, and that this is due to human activity. Increasing the sea surface temperatures alone will not automatically translate into more tropical cyclones or stronger tropical cyclones. Thus, this latest study should not cause people to worry that more hurricane disasters are on the way courtesy of Mother Nature.