

Study implicates global warming as a factor in increasing economic losses due to hurricanes

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Hurricane Isabel (2003) as seen from orbit during Expedition 7 of the International Space Station. Credit: NASA

(Phys.org)—A trio of researchers affiliated with Universidad Nacional

Autónoma in Mexico, and VU University in the Netherlands, has conducted a study on the source of an increase in property dollar amounts lost over the past several decades due to hurricanes and has concluded that it cannot be blamed on an increase in wealth or construction—instead, they suggest in their paper published in *Nature Geoscience*, that it is due to more storms, because of global warming. Stéphane Hallegatte with the Climate Change Policy Team at the World Bank, offers a News & Views piece in the same journal edition on the work done by the team, outlining the process that was used, and highlighting possible problems with the results.

Monetary losses that come about due to natural disasters are on the rise, particularly from storms such as hurricanes—that much is clear. What is not clear is whether this trend can be blamed on changes in the weather or people building more expensive stuff in the path of such storms. Some recent studies have found that it is mostly the latter, but that, the researchers with this new effort argue, is because the approach used to reach such conclusions was flawed.

The traditional way of normalizing damage from hurricanes, Hallegatte explains, involves an approach where it is assumed that an increase in damage would come about evenly with an increase in wealth—i.e. doubling wealth in an area would double the damage costs that occurred in it. But that thinking is flawed, the researchers contend, because it does not take into consideration the fact that as an area grows more wealthy, some of that money is used to prevent storm damage. They conducted their own study using a method that took such changes into account and their results showed that the economic loss increases due to hurricanes over the period 1900 to 2005 could not be solely attributed to an increase in wealth—they suggest that the other increase was due to an increased number of storms and stronger intensity (due to global warming) and further suggest that between 2 and 12 percent of losses due to such storms in the year 2005 alone (the year Katrina struck New Orleans),

could be attributed to global warming.

Hallegatte agrees with the approach used by the researchers but points out that the change used to normalize the data is not proven, nor is the assumption that an increase in the number of storms, or their intensity can be blamed on [global warming](#).

More information: Francisco Estrada et al. Economic losses from US hurricanes consistent with an influence from climate change, *Nature Geoscience* (2015). [DOI: 10.1038/ngeo2560](https://doi.org/10.1038/ngeo2560)

Abstract

Warming of the climate system and its impacts on biophysical and human systems have been widely documented. The frequency and intensity of extreme weather events have also changed, but the observed increases in natural disaster losses are often thought to result solely from societal change, such as increases in exposure and vulnerability. Here we analyse the economic losses from tropical cyclones in the United States, using a regression-based approach instead of a standard normalization procedure to changes in exposure and vulnerability, to minimize the chance of introducing a spurious trend. Unlike previous studies, we use statistical models to estimate the contributions of socioeconomic factors to the observed trend in losses and we account for non-normal and nonlinear characteristics of loss data. We identify an upward trend in economic losses between 1900 and 2005 that cannot be explained by commonly used socioeconomic variables. Based on records of geophysical data, we identify an upward trend in both the number and intensity of hurricanes in the North Atlantic basin as well as in the number of loss-generating tropical cyclone records in the United States that is consistent with the smoothed global average rise in surface air temperature. We estimate that, in 2005, US\$2 to US\$14 billion of the recorded annual losses could be attributable to climate change, 2 to 12% of that year's normalized losses. We suggest that damages from tropical

cyclones cannot be dismissed when evaluating the current and future costs of climate change and the expected benefits of mitigation and adaptation strategies.

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