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**BUSINESS**

# Study finds the warmer it gets, the more world economy hurts

Global warming could shrink average global income 23 percent by the end of the century

By **Seth Borenstein**

The Associated Press

POSTED: 10/22/2015 12:01:00 AM MDT

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Laborers on the outskirts of Islamabad, Pakistan bathe with water leaking from a fire hydrant. (B.K. Bangash, AP)

WASHINGTON — With each upward degree, global warming will singe the economies of three-quarters of the world's nations and widen the north-south gap between rich and poor countries, according to a new economic and science study.

Compared with what it would be without more global warming, the average global income will shrivel 23 percent at the end of the century if heat-trapping carbon dioxide pollution continues to grow at its current trajectory, according to a study published Wednesday in the scientific journal Nature.

Some countries, such as Russia, Mongolia and Canada, would see large economic benefits from global warming, the study projects. Most of Europe would do slightly better; the U.S. and China slightly worse. Essentially all of Africa, Asia, South America and the Middle East would be hurt dramatically, the economists found.

"What climate change is doing is basically devaluing all the real estate south of the United States and making the whole planet less productive," said study co-author Solomon Hsiang, an economist and public policy professor at the University of California at Berkeley. "Climate change is essentially a massive transfer of value from the hot parts of the world to the cooler parts of the world.

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Lead author Marshall Burke of Stanford and Hsiang examined 50 years of economic data in 160 countries and even county-by-county data in the U.S. (http://web.stanford.edu/~mburke/climate/) and found what Burke called "the Goldilocks zone in global temperature at which humans are good at producing stuff" — an annual temperature of around 55.4 degrees Fahrenheit, give or take a degree.

For countries colder than that economic sweet spot, every degree of warming heats up the economy and benefits. For the U.S. and other countries already at or above that temperature, every degree slows productivity, Burke and Hsiang said.

While it is fairly obvious that unusual high temperatures hurt agriculture, past studies show hot days even reduce car production at U.S. factories, Burke said.

"The U.S. is really close to the global optimum," Burke said, adding that as it warms, the U.S. will fall off that peak. The authors calculate a warmer U.S. in 2100 will have a gross domestic product per person that's 36 percent lower than it would be if warming stopped about now.

But because the U.S. is now at that ultimate peak, there's greater uncertainty in the study's calculations than in places such as India, Pakistan, Vietnam, Nigeria and Venezuela, where it's already hot and there's more certainty about dramatic economic harm, Hsiang said.

The authors' main figures are based on the premise that carbon dioxide emissions will continue to rise at current trajectory. But countries across the world are pledging to control if not cut carbon pollution as international leaders prepare for a summit on climate change in Paris later this year. If the current pledge kept, the warming cost in 2100 will drop from 23 percent to 15 percent, Burke said.

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