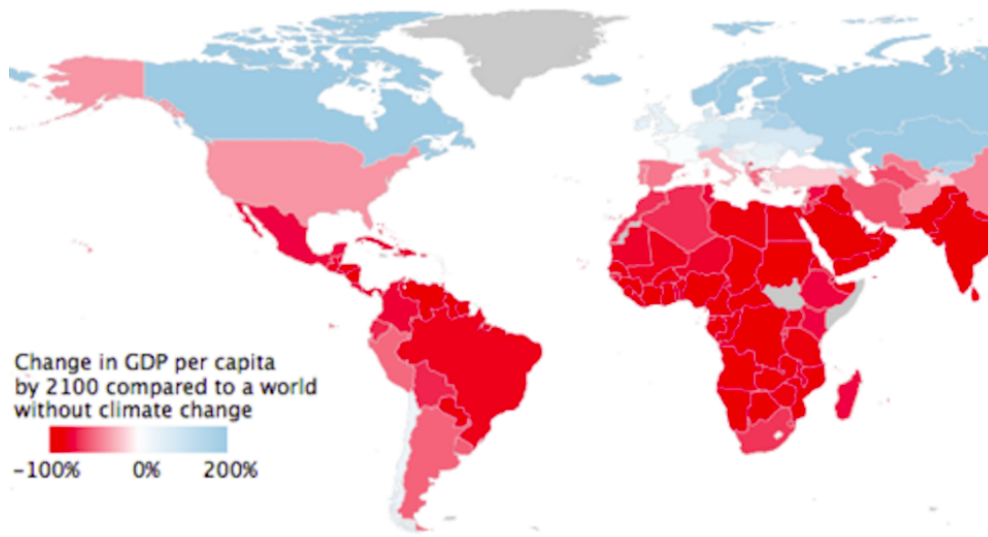


Science News

Climate Change Economies

December 2, 2015

by Molly Michelson



As nations work toward an agreement to lower emissions at this week's [climate talks in Paris](http://www.cop21.gouv.fr/en/) (<http://www.cop21.gouv.fr/en/>), one thing on leaders' minds will be how much it will cost their countries to make the changes necessary to reduce emissions. But they should also consider how much it will cost their countries if they don't make any changes at all.

In October, Stanford and UC Berkeley researchers published a [paper](http://nature.com/articles/doi:10.1038/nature15725) (<http://nature.com/articles/doi:10.1038/nature15725>) about the effects of climate change on economies around the world. And they found that if we do nothing to stop warming, average global incomes will drop roughly 23% by 2100, making 77% of countries poorer than they would be without climate change.

To untangle the effect of temperature from other factors, the study's authors drew on World Bank data for 166 countries between 1960 and 2010, linking it to climatological data not usually analyzed in

macroeconomic studies. "We asked, is this a global phenomenon?" says co-author [Solomon Hsiang](https://gspp.berkeley.edu/directories/faculty/solomon-hsiang) (<https://gspp.berkeley.edu/directories/faculty/solomon-hsiang>), of the

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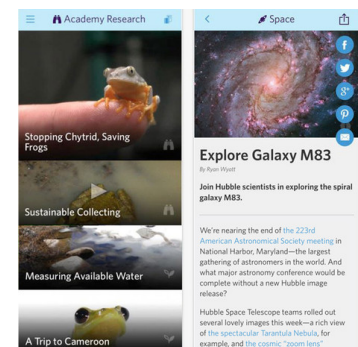
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Goldman School of Public Policy at UC Berkeley, about the paper's origins. "When the temperatures change and fluctuate... does that drive larger patterns in how economies perform?"

The team found that temperature has a huge effect on economic performance, Hsiang says. "Countries that are too cold underperform, as they warm up they look like they're more productive, there's sort of a sweet spot in the middle, and then, as you get hotter and hotter, they start performing worse again." The team found that the sweet spot is an annual average of 13° Celsius (or 55° Fahrenheit).

"And so the U.S. and China—some of the famously productive places—actually turn out to be in that sweet spot, so we're very lucky in terms of the climate we inhabit," he says. "But then there's a lot of places around the world... these hotter countries on average—places throughout Africa, Central America, South Asia—and high temperatures lead to large economic declines in these countries in particular."

The team then took the data further. "What happens when the climate is going to change?" Hsiang says the team asked. "The temperatures are going to get warmer so some of those countries that are cooler are going to start performing better. Countries that are in the great spot right now, they're going to get pushed off the top of the hill and they're going to start underperforming, and the countries that are already hot, they're going to perform even worse."

The U.S. and China would see economic productivity decline, despite their current wealth. While Russia, Mongolia, and northern Europe would witness economic gains, "the globe as a whole is going to be much less productive on average," Hsiang explains. "Climate change is basically the largest transfer of value that's ever been seen on the planet."

World leaders take note! Ultimately, it will likely be more affordable for your country to address climate change than to do nothing at all.

Image: Burke, Hsiang, & Miguel (Nature, 2015)