

Climate-driven temperature swings slow economic growth

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Climate change caused by the burning of fossil fuels is causing planet-wide temperature rises that have intensified deadly droughts, heatwaves, floods and superstorms

Increasingly erratic weather caused by global warming threatens global

economic growth, scientists warned Monday with a report showing that even short-lived climate volatility can have a significant impact.

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But researchers from Potsdam Institute for Climate Impact Research (PIK), Columbia University and the Mercator Research Institute on Global Commons and Climate Change said impact studies often look at annual averages, rather than the effects of day-to-day temperature fluctuations.

"The real problem caused by a changing climate are the unexpected impacts, because they are more difficult to adapt to," said co-author Anders Levermann from PIK and Columbia, adding that these rapid changes work differently to long term ones.

"Farmers and other businesses around the world have started to adapt to climate change. But what if weather becomes simply more erratic and unpredictable?"

The study, published in *Nature Climate Change*, compared day-to-day temperature fluctuations between 1979 and 2018 with the corresponding regional economic data from more than 1,500 regions worldwide.

They found that an extra degree Celsius of variability—up or down—results in an average five percentage-point reduction in regional growth rates.

Poor regions hit hardest

Parts of the economy hit by these daily temperature swings include crop

yields, human health and sales, the authors said.

"Policy makers and industry need to take this into account when discussing the real cost of climate change," Levermann said in a statement.

Economies like Canada or Russia, where average monthly temperature varies by more than 40 degrees Celsius within a year, seemed better able to cope with daily volatility than parts of Latin America or Southeast Asia, where temperatures can fluctuate as little as 3C, said Leonie Wenz of PIK.

"Furthermore, income protects against losses," Wenz said.

"Even if at similar latitude, economies in poor regions are more strongly affected when daily temperature fluctuates than their counterparts in rich regions."

In 2015, the world's nations vowed to cap global warming "well below" 2C, and 1.5C if possible.

A subsequent report from the UN's climate science advisory panel, the IPCC, left no doubt that 1.5C was the safer threshold. There has been just over 1C of warming so far.

The six years since 2015 are the six warmest ever registered, as are 20 of the last 21, evidence of a persistent and deepening trend, the European Union's Copernicus Climate Change Service has said.

More information: Day-to-day temperature variability reduces economic growth, *Nature Climate Change* (2021). [DOI: 10.1038/s41558-020-00985-5](https://doi.org/10.1038/s41558-020-00985-5), www.nature.com/articles/s41558-020-00985-5

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