

# Climate change beliefs more influenced by long-term temperature fluctuations

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Longer-run local temperature fluctuations are significant predictors of beliefs about the occurrence of global warming, according to a paper by Tatyana Deryugina, a professor of finance in the College of Business.

In spite of the broad scientific consensus about its existence, global warming remains a contentious public policy issue. Yet it's also an issue that requires a public consensus to support policies that might curb or counteract it.

According to research from a University of Illinois expert in environmental and behavioral economics, the task of educating the public about climate change might be made easier or more difficult

depending on their perception of short-term versus long-term temperature changes.

A paper by Tatyana Deryugina, a professor of finance in the College of Business, finds that longer-run local temperature fluctuations – abnormally warm or cold temperatures that last from one month up to a year – are significant predictors of beliefs about the occurrence of [global warming](#). On the other hand, short-run temperature fluctuations – from a day up to two weeks – have no effect on those beliefs.

The finding is significant because it might help to explain how people form and update beliefs about climate change, Deryugina said.

"Although the time for mitigation is running out, both the U.S. and the international community have failed to produce a comprehensive binding agreement to combat climate change," she said. "There are many possible reasons for this, but the lack of public pressure may be an important contributing factor. That's why it's essential to understand how individual beliefs about climate change are formed and what causes them to evolve."

Using a multiyear survey, Deryugina tested whether local temperature abnormalities influenced how individuals formed conclusions about the occurrence of global warming.

"The main point is that people use their local weather to update their beliefs about climate change," she said. "That finding isn't new – other papers have found similar things. However, those papers focused on short-term abnormalities of one day to one week, which, in my data, doesn't seem to matter as much as longer-run abnormalities, on the order of two months or more."

One way to interpret the results is that people aren't going to feel a sense

of urgency until climate change is well underway, Deryugina said.

"If people judge the occurrence of climate change by whether it's hot or cold now, we're going to have to suffer quite a bit before any mitigation policy we implement actually has an effect," she said. "So even if the international community eventually gets something done, it might be too little, too late, since some greenhouse gases remain in the atmosphere for decades or longer.

"This means any policy we implement now is going to have a delayed effect, which, in turn, means that we need to be forward-looking in implementing it," she said.

Although the research doesn't indicate what weight people give to national or global temperatures, Deryugina said it doesn't rule out the possibility that individuals "observe weather everywhere but irrationally give greater weight to local weather."

"People give extra weight to local temperatures, but how much extra is hard to say," she said.

It's also possible that the effects of temperatures are indirect.

"The exact pathway through which the effects of temperature work is difficult to determine," Deryugina said. "For example, more extreme temperatures could lead to more discussion of global warming in local media and more exposure to other evidence about global warming, such as reports from the Intergovernmental Panel on Climate Change."

People also tend to forget events like heat waves, "which seem to make no difference in their beliefs about [climate change](#)," Deryugina said.

"All the surveys I use were done in March, so all heat waves would have

happened 8 to 11 months before the survey," she said. "Although [temperature fluctuations](#) from this long ago do affect beliefs, [heat waves](#) have, surprisingly, no effect."

The study was published in the journal *Climatic Change*.

**More information:** The study is available online:  
[deryugina.com/Deryugina GW beliefs weather.pdf](http://deryugina.com/Deryugina_GW_beliefs_weather.pdf)

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