

## Warming Climate Seen as Prod to Violence

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A provocative new multidisciplinary study suggests that a global temperature rise of 2 degrees Celsius could increase the rate of intergroup conflicts, such as civil wars, by more than 50 percent in many parts of the world.

Researchers from the University of California, Berkeley and Princeton University posit that even minor changes in rainfall patterns or temperatures can substantially increase the risk of conflict. Still, investigators stress that such conflict dynamics remain poorly understood.

The study, published in the journal *Science*, shows that Earth's climate plays a more influential role in human affairs than previously thought.

Researchers say the investigation included more data than prior research and covered all major regions of the globe.

The authors found similar patterns of conflict around the world that were linked to changes in climate, such as increased drought or higher-than-average annual temperature.

Examples include spikes in domestic violence in India and Australia; increased assaults and murders in the United States and Tanzania; ethnic violence in Europe and South Asia; land invasions in Brazil; police using force in the Netherlands; civil conflicts throughout the tropics; and even the collapse of Mayan and Chinese empires.

The study could have critical implications for understanding the impact of future climate change on human societies, as many climate models project global temperature increases of at least 2 degrees Celsius over the next 50 years.

The study draws on a variety of research fields including climatology, archaeology, economics, political science and psychology to provide a comprehensive look at how climatic changes shape human conflict and violence.

"What was lacking was a clear picture of what this body of research as a whole was telling us," said Solomon Hsiang, Ph.D., the study's lead author.

"We collected 60 existing studies containing 45 different data sets and we reanalyzed their data and findings using a common statistical framework. The results were striking."

They examined various aspects of climate such as rainfall, drought or temperature, and their associations with various forms of violence within three broad categories of conflict:

- Personal violence and crime such as murder, assault, rape, and domestic violence;
- Intergroup violence and political instability, like civil wars, riots, ethnic violence, and land invasions;
- Institutional breakdowns, such as abrupt and major changes in governing institutions or the collapse of entire civilizations.

The results showed that all three types of conflict exhibit systematic and large responses to changes in climate, with the effect on intergroup conflict being the most pronounced.

Investigators discovered conflict responded most consistently to temperature, with all 27 out of 27 studies of modern societies finding a positive relationship between high temperatures and greater violence.

A central contribution of the study is a consistent methodology to compare results around the world — because the nature of climatic events differs across locations.

The authors' new approach was to convert climate changes into location-specific units known to statisticians as standard deviations.

"We found that a 1 standard deviation shift towards hotter conditions causes the likelihood of personal violence to rise four percent and intergroup conflict to rise 14 percent," said Marshall Burke, the study's co-lead author.

"We often think of modern society as largely independent of the environment, due to technological advances, but our findings challenge that notion," said study coauthor Edward Miguel.

"Our results shed new light on how the future climate will shape human societies," said Burke.

The researchers said that exactly why climate affects conflict and violence is the most pressing question for future research.

Source: [University of California – Berkeley](#)