

Aug 01, 2013 03:13 PM EDT

Climate Change Linked to Hot Tempers: Global Warming Negatively Affecting Human Behavior

By Zulai Serrano



Global warming

A new study shows there is a link between climate change and human violence, according to researchers at the University of California, Berkeley, and Princeton University.

The study findings were published in Thursday in the journal [Science](#)

[According to a news release](#), researchers gathered more data than any prior study, and were able to evaluate Earth's climate changes and how it has influenced human behavior:

The study data covers all major regions of the world and show similar patterns of conflict linked to climatic changes, 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 Holland; civil conflicts throughout the tropics; and even the collapse of Mayan and Chinese empires.

There have been many studies on this topic from different research fields ranging from climatology, archaeology and economics to political science and psychology. However, few researchers have connected the studies to create a

whole picture.

"What was lacking was a clear picture of what this body of research as a whole was telling us," said Solomon Hsiang in a news release, the study's lead author, who was a postdoctoral fellow in Science, Technology, and Environmental Policy at Princeton during the research project and is now an assistant professor of public policy at UC Berkeley's Goldman School of Public Policy. "We collected 60 existing studies containing 45 different data sets and we re-analyzed their data and findings using a common statistical framework. The results were striking."

In order to determine if a link between climate and conflict existed at multiple levels of social organization, the UC Berkeley-Princeton researchers looked at whether evidence of a linkage was consistent within each of three broad categories of conflict, according to the news release:

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

The researchers found all 27 out of 27 studies of modern societies agreed there was a positive relationship between high temperatures and greater violence.

"We found that a 1 standard deviation shift towards hotter conditions causes the likelihood of personal violence to rise 4 percent and intergroup conflict to rise 14 percent," said Marshall Burke, the study's co-lead author and a doctoral candidate at Berkeley's Department of Agricultural and Resource Economics.

"For a sense of scale, this kind of temperature change is roughly equal to warming an African country by 0.4°C (0.6°F) for an entire year or warming a United States county by 3°C (5°F) for a given month. These are moderate changes, but they have a sizable impact on societies."

The next question scientists' wish to research is *why* there is a link between hot temperatures and more violence. As of right now, there is no clear answer.

"We're in the same position that medical researchers were in during the 1930s: they could find clear statistical evidence that smoking tobacco was a proximate cause of lung cancer, but they couldn't explain why until many years later. In the same way, we can show that climatic events cause conflict, but we can't yet exactly say why," said Hsiang.

"Currently, there are several hypotheses explaining why the climate might influence conflict. For example, we know that changes in climate shape prevailing economic conditions, particularly in agrarian economies, and studies suggest that people are more likely to take up arms when the economy deteriorates, perhaps in part to maintain their livelihoods."

As of right now, there is no clear answer why the correlation exists, but researchers believe the reasoning lies in multiple mechanisms, since there is not one theory to sum up all the evidence.

"The studies showing that high temperature increases violence crime in the U.S. and other wealthy societies seems to suggest that physiological responses are important, too, with very short-run exposure to heat contributing to more aggressive and violent behavior," Burke said. Nonetheless, in all cases, he noted "the collected evidence shows that humans across the globe have proven poorly

equipped to deal with exposure to hotter temperatures."