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Monkey Cage

How climate change makes the world more violent

By **Alex Bollfrass** and **Andrew Shaver** May 21 at 8:30 AM

Dry cracked earth is visible on what used to be the bottom of Hensley Lake on April 23, 2015 in Raymond, California. (Photo by Justin Sullivan/Getty Images)

The following is a guest post from Princeton University political science Ph.D. candidates Alex Bollfrass and Andrew Shaver.

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Natural scientists agree that the climate is changing and that humans bear some of the blame. Social scientists are now attempting to assess the economic and political price societies are likely to pay for turning up our planet's thermostat. The security policy community is especially eager for an answer.

In the academy, the debate over climate change and its security implications gained momentum after researchers from Stanford, the University of California Berkeley, New York University, and Harvard observed that civil wars were more prevalent during years that experience hotter temperatures.

The chief explanation for this relationship is that higher temperatures affect crop yields. Diminished agricultural output, in turn, as economist Ted Miguel and co-authors explain in a separate study, affects young men who are "more likely to take up arms when income opportunities are worse for them in agriculture [. . .] relative to their expected income as [fighters]."

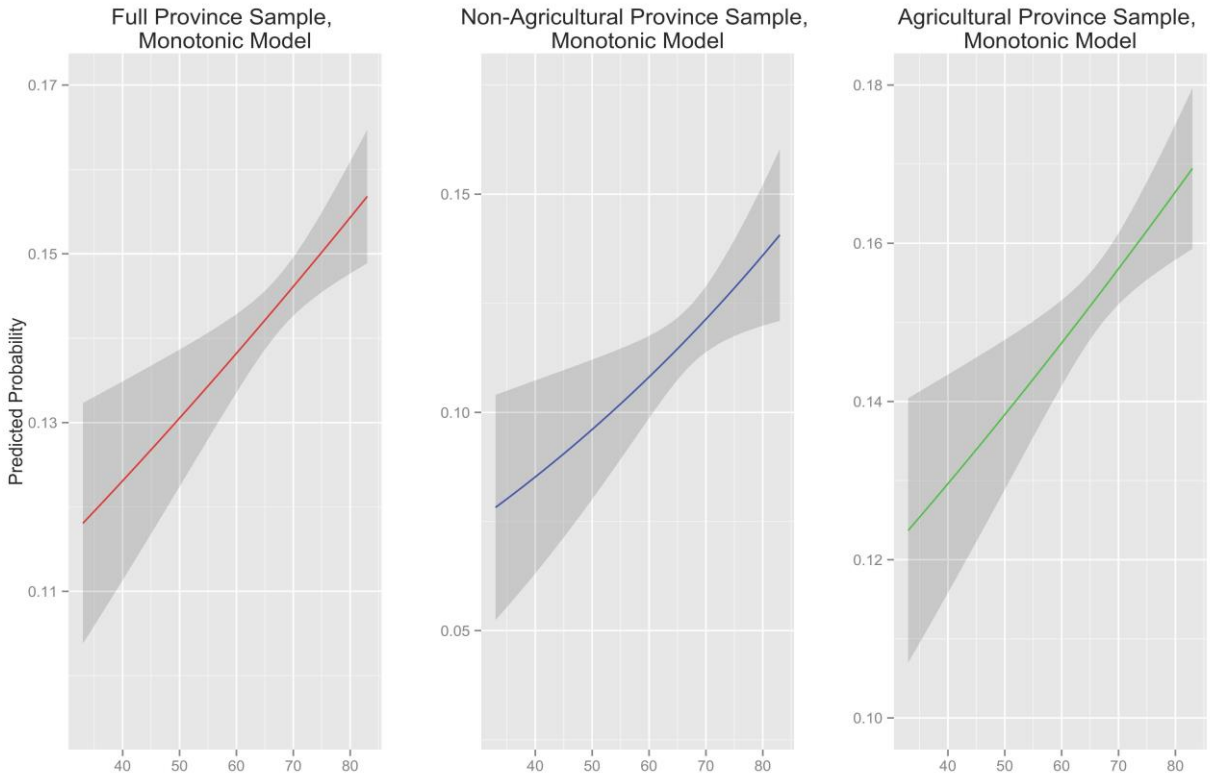
The "farmhands-to-fighters" argument linking reduced economic opportunity in agriculture to increased violent activity is consistent with other research results. Scholars at the University of California, Santa Barbara and Columbia University argue that recent drought in Syria produced "widespread crop failure and a mass migration of farming families," resulting in in political unrest that ultimately contributed to the outbreak of civil war in the country. Research on modern-day piracy, violence in Colombia, and contemporary conflict throughout Africa is similarly consistent with this theory.

It is possible to extrapolate from this research and imagine how conflict resulting from decreased agricultural employment could threaten U.S. national security interests. But changing climate trends can produce security risks in other ways.

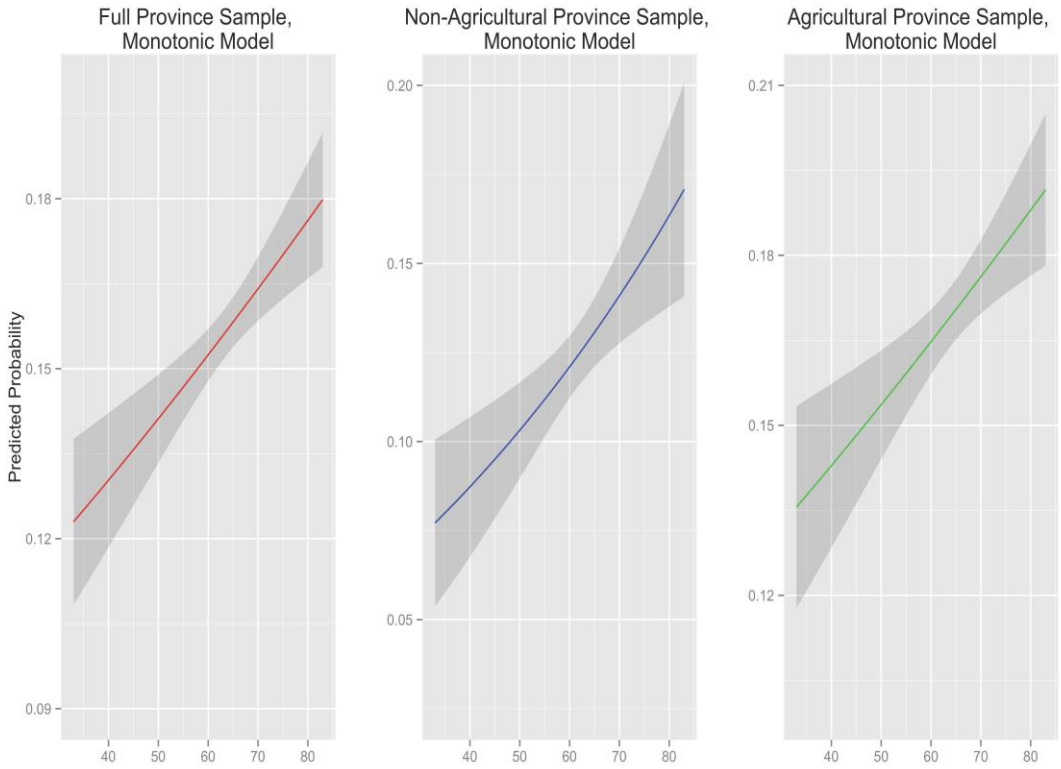
In research published Wednesday in PLOS ONE, we raise further questions about the relationship between conflict and variation in meteorological variables. Our first major finding is that warmer ambient temperatures indeed promote violent conflict in all parts of the world.

The second main discovery is that heat drives violence by something more than turning farmhands into fighters. Our clearest evidence that there is more to the temperature-conflict link than disaffected farm workers is that heat and violence are correlated even in areas of the world that do not produce crops

(see the two figures below). Without farms, there are no farmers who would beat their plowshares into swords.



Predicted Probability of Conflict and Yearly Average Temperature, with 95% Confidence Intervals – Agricultural and Non-Agricultural Provinces Compared
Data: European Space Agency; Peace Research Institute Oslo; Figure: Alex Bollfrass; Andrew Shaver



Predicted Probability of Conflict and Yearly Average Temperature, with 95% Confidence Intervals – Agricultural and Non-Agricultural Provinces Compared (Sub-Saharan/Sahelian African countries excluded)
Data: European Space Agency; Peace Research Institute Oslo; Figure: Alex Bollfrass; Andrew Shaver

The implication is that the debate has been missing a scholarly foundation for other avenues through which climate change may threaten states' security. One leading possibility is the well-established patterns of humans behaving more violently at higher temperatures. Another way for climate change to link to violent instability is through macroeconomic transmitters like food prices in years of lower farm production. The list of plausible alternatives is long and has received little scrutiny.

To date, there is enough preliminary evidence to suggest that a real security problem may be developing. Focusing research on the drivers of this temperature-violence should be a priority for academic and government researchers.