

Models underestimate future temperature variability; Food security at risk

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Climate warming caused by greenhouse gases is very likely to increase the variability of summertime temperatures around the world by the end of this century, a University of Washington climate scientist said Friday. The findings have major implications for food production.

Current <u>climate models</u> do not adequately reflect feedbacks from the relationship between the atmosphere and soil, which causes them to underestimate the increase of variability in summertime temperatures, said David Battisti, a UW professor of atmospheric sciences.

While warmer temperatures already have implications for food production in the tropics, the new findings suggest the increase in the volatility of summertime temperatures will have serious effects in graingrowing regions of Europe and North and South America, Battisti said.

"If there's greater variability, the odds of the temperature being so high that you can't grow a crop are greater," he said.

"In terms of regional and global food security, it's not good news."

Battisti presented his findings at the <u>American Association for the</u> <u>Advancement of Science</u> meeting in Vancouver, Canada. His discussion was part of a panel on climate and global food security that included Rosamond Naylor of Stanford University and Daniel Vimont of the University of Wisconsin, with whom he has collaborated on previous food security research.



Earlier research has shown that by the end of this century, the increase in average growing season temperature, if other factors remain the same, will likely reduce yields of rice, corn and soybean 30 to 40 percent. Already <u>rice yields</u> in the tropics are being affected by higher temperatures, affecting nations such as Indonesia, which frequently imports rice to stabilize prices, Battisti said.

In addition, the scientists say global warming will have greater impacts than previously thought on the El Niño Southern Oscillation, a tropical phenomenon that has global impact on climate and food production. Their conclusions are based on geological and other proxy records of climate and El Niño from the last 10,000 years, plus recent analyses of long-term climate changes because of global warming.

The Intergovernmental Panel on Climate Change, the United Nations body conducting ongoing assessments of climate change, has estimated that future month-to-month temperature variability during summer months is likely to be greater in some places and less in some places, but should stay roughly constant in many places.

But the new modeling work, Battisti said, shows most areas can expect to see greater variability in summer temperatures between now and 2085, with the biggest impacts in Europe, Africa and South America.

"The increased variability will be pretty ubiquitous. You will see it pretty much everywhere."

Increased temperature variability compounds the loss of production because of higher average temperatures, Battisti said. Add higher fertilizer prices and other market pressures to the mix "and food insecurity is likely to be higher than it has been for some time."



Provided by University of Washington

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