

Marshall Burke

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Professional appointments and affiliations

2014-present	Assistant Professor, Dept. of Earth System Science , Stanford University Center Fellow, Center on Food Security and the Environment, Freeman Spogli Institute for International Studies, Stanford University
2014-2015	Visiting Fellow, Stanford Institute for Economic Policy Research
2016-present	Faculty Research Fellow, National Bureau of Economic Research
2015-present	Faculty Fellow, Stanford Institute for Economic Policy Research
2015-present	Faculty Fellow (by courtesy), Stanford Woods Institute for the Environment
2015-present	Faculty Affiliate, Stanford Center on International Development
2015-present	Faculty Affiliate, Center for Effective Global Action

Education

Ph.D., Agricultural and Resource Economics, UC Berkeley, 5/2014

B.A. International Relations, Stanford University, 6/2003

Working papers

The economic origins of conflict in Africa (with Eoin McGuirk). NBER Working Paper w23056. *R&R, Journal of Political Economy*

Effect of ambient temperature on suicide in the US and Mexico (with Felipe Gonzalez, Patrick Baylis, Sam-Heft Neal, Sanjay Basu, and Sol Hsiang).

Buying low and selling high: an arbitrage puzzle in Kenyan villages (with Lauren Bergquist and Ted Miguel).

Economic and non-economic factors in violence: evidence from organized crime, suicides and climate in Mexico (with Ceren Baysan, Felipe Gonzalez, Sol Hsiang, and Ted Miguel)

Analysis of statistical power reconciles climate-conflict results in Africa (with Sol Hsiang, Edward Miguel, Mark Cane, and Kyle Meng).

Published and forthcoming journal articles

1. Marshall Burke and David Lobell. 2017. Satellite-based assessment of yield variation and its determinants in smallholder African systems. forthcoming, *PNAS*
2. Sam Heft-Neal, David Lobell, and Marshall Burke. 2017. Using remotely sensed temperature to estimate climate response functions. forthcoming, *Environmental Research Letters*

3. Marshall Burke, Sam Heft-Neal, and Eran Bendavid. 2016. Understanding variation in child mortality across Sub-Saharan Africa: A spatial analysis. *Lancet Global Health*, 4(12), e936-e945
4. Neal Jean*, Marshall Burke*, Michael Xie, Matt Davis, David Lobell, and Stefano Ermon. 2016. Combining satellite imagery and machine learning to predict poverty. *Science*, 353(6301), 790-794. (*denotes equal authorship) [[webpage](#)]
5. Marshall Burke and Kyle Emerick. 2016. Adaptation to climate change: evidence from US agriculture. *American Economic Journal - Economic Policy*, 8(3), 106-140.
6. Opportunities for advances in climate change economics. 2016. (with Melanie Craxton, Charlie Kolstad, Chikara Onda, and 20 coauthors). *Science* 352, 292-293, 2016
7. Tamma Carleton, Sol Hsiang, and Marshall Burke. 2016. Conflict in a changing climate. *European Physical Journal* 225, 489-511.
8. Some research challenges in the economics of climate change (with Melanie Craxton, Charlie Kolstad, and Chikara Onda). *Climate Change Economics*, 7(2), 2016
9. Marshall Burke*, Sol Hsiang*, and Edward Miguel. 2015. Global non-linear effect of temperature on economic output. *Nature* 527: 235-239. (*denotes equal authorship) [[webpage](#)]
10. Climate and conflict (with Sol Hsiang and Edward Miguel). *Annual Review of Economics*, 2015.
11. Marshall Burke, Edward Miguel, Shanker Satyanath, John Dykema, and David Lobell. 2015. Incorporating climate uncertainty into estimates of climate change impacts. *Review of Economics and Statistics*, 97(2): 461-471.
12. Marshall Burke, Erick Gong, Kelly Jones. 2015. Income shocks and HIV. *Economic Journal* 125, 1157-1189.
13. Sol Hsiang, Marshall Burke, and Edward Miguel. 2014. Reconciling climate-conflict meta-analyses: reply to Buhaug et al. *Climatic Change*, DOI 10.1007/s10584-014-1276-z
14. S. Hsiang*, M. Burke*, and E. Miguel. 2013. Quantifying the influence of climate on human conflict. *Science* 341: 1212. (*denotes equal authorship)
15. S. Hsiang and M. Burke. 2013. Climate, conflict, and social stability: what does the literature say? *Climatic Change*, 10.1007/s10584-013-0868-3.
16. J. Burney, L. Woltering, M. Burke, D. Pasternak, R. Naylor. 2010. Solar powered drip irrigation enhances food security in the Sudano-Sahel. *PNAS*, 10.1073/pnas.0909678107
17. T. Hertel, M. Burke, D. Lobell. 2010. The poverty implications of climate-induced yield changes by 2030. *Global Environmental Change*, 20(4), 577-585.
18. D. Lobell and M. Burke. 2010. On the uses of statistical models to predict crop yield responses to climate change. *Agricultural and Forest Meteorology* 150, 1443-1452.
19. M. Burke, E. Miguel, S. Satyanath, J. Dykema, D. Lobell. 2009. Warming increases the risk of civil war in Africa. *PNAS* 106, 20670-20674.
20. M. Burke, D. Lobell, L. Guarino. 2009. Shifts in African crop climates by 2050 and the implications for adaptation. *Global Environmental Change* 19, 317-325.
21. D. Lobell, M. Burke et al. 2008. Prioritizing climate change adaptation needs for food security in 2030. *Science* 319, 607-610.
22. D. Lobell, M. Burke. 2008. Why are agricultural impacts of climate change so uncertain? The importance of temperature relative to precipitation. *Environmental Research Letters* 3, July 2008.

23. M. Burke, K. Oleson, E. McCullough, J. Gaskell. 2008. Quantifying the environmental impacts of trade in meat products. *Environmental Modeling and Assessment* 13, July 2008.
24. R. Naylor, A. Liska, M. Burke et al. 2007. The ripple effect: Biofuels, food security, and the Environment. *Environment* 49 (9), 30-43.
25. J. Galloway, M. Burke et al. 2007. International trade in meat: The tip of the pork chop. *Ambio* 36 (8), 622-628.
26. R. Naylor, D. Battisti, D. Vimont, W. Falcon, M. Burke. 2007. Assessing risks of climate variability and climate change for Indonesian rice agriculture, *PNAS* 104, 7752-7757.
27. R. Naylor and M. Burke. 2005. Aquaculture and ocean resources: Raising the tigers of the sea. *Annual Review of Environment and Resources* 30: 185-218.
28. W. Falcon, R. Naylor, W. Smith, M. Burke, and E. McCullough. 2004. Using climate models to improve Indonesian food security. *Bulletin of Indonesian Economic Studies* 40(3): 355-377.

Books and book chapters

- D. Lobell and M. Burke, eds. 2009. *Climate change and food security: Adapting Agriculture to a Warmer World*. Springer, (co-editor, and contributing four chapters).
- D. Lobell and M. Burke. 2009. Economic impacts of climate change on agriculture to 2030, in *Climate Change and Crop Production*, M. Reynolds ed., CABI.
- J. Galloway, M. Burke et al. 2007. Animal production and the nitrogen cycle, in *Livestock and a Changing Landscape*, H. Mooney et al, eds. SCOPE Scientific and Technical volume.

Awards

- National Science Foundation, Graduate Student Research Fellowship, 2009-2013.
- Berkeley Fellowship, 2009-2011.

Grants

- Closing the Data Divide: Machine Learning Approaches for Understanding Livelihoods of the Poor Using Unconventional Data Sources*, Stanford Global Development and Poverty initiative, \$379,000. co-PI with Stefano Ermon and David Lobell.
- Climate change, nutrition, and population health*, Stanford Woods Institute Environmental Ventures Project, \$180,000. PI with Eran Bendavid, Sanjay Basu, David Lobell, 2015.
- Remote sensing approaches to improving aid targeting and understanding aid effectiveness*, USAID/AidData \$150,000. PI with David Lobell.
- Climate and global poverty*, Stanford Global Development and Poverty initiative, \$50,000. PI with Sol Hsiang.
- Experimental evidence on grain storage among farmers and traders in Kenya*, Gates Foundation ATAI Initiative, \$425,000. Co-investigator with Edward Miguel and Lauren Falcao, 2014.
- Barriers to private-sector arbitrage in Kenyan maize markets*, Center for Economic Policy Research, \$48,000, Investigator with Lauren Falcao, 2013.

Quantifying agricultural adaptation to climate change, Giannini Foundation, \$25,000. Co-investigator with Edward Miguel and Solomon Hsiang, 2013.

Price fluctuations, grain storage, and barriers to arbitrage in Kenyan maize markets, Anonymous donor, \$58,000. Co-investigator with Edward Miguel and Lauren Falcao, 2013.

Enhancing smallholder storage, Anonymous donor, \$100,000. Co-investigator with Edward Miguel and One Acre Fund, 2012.

Optimal finance for agricultural technology adoption, Gates Foundation ATAI Initiative, \$240,000. Co-investigator with Edward Miguel, 2011.

Weather risk, index insurance, and agricultural technology adoption, Gates Foundation ATAI Initiative, \$50,000. Co-investigator with Edward Miguel. 2010.

Prioritizing Investments in Food Security Under a Changing Climate, Rockefeller Foundation, \$350,000. Co-investigator with David Lobell and others. 2008.

An Alternative Development Model? Assessing Solar Electrification for Income Generation in Rural Benin. Stanford Woods Institute Environmental Ventures Project, \$150,000. Co-investigator with Roz Naylor and Jen Burney. 2008.

Other

Referee: *American Economic Review*, *Quarterly Journal of Economics*, *Journal of Political Economy*, *Economic Journal*, *Review of Economics and Statistics*, *Nature*, *PNAS*, *American Journal of Agricultural Economics*, *World Bank Economic Review*, *Journal of Environmental Economics and Management*, *Journal of Development Economics*, *World Politics*, *Journal of the European Economic Association*, *Journal of Development Studies*, *Journal of Economic Geography*, *Journal of African Economies*, *Nature Climate Change*, *Climatic Change*, *Climate Research*, *Environmental Research Letters*, *Global Environmental Change*, *Journal of Peace Research*, *PLOS One*, *Food Policy*

Other writing:

1. "Climate robustly linked to African civil war", *PNAS*, 2010 (with Ted Miguel, Shanker Satyanath, John Dykema, and David Lobell). [Comment on Buhaug, 2010]
2. "Weather and Violence", *New York Times* op-ed (with Sol Hsiang and Ted Miguel), August 30th, 2013
3. "Temperature and violence", *Nature Climate Change*, 2014 (with Mark Cane, Ted Miguel, Sol Hsiang, David Lobell, Kyle Meng, and Shanker Satyanath). [comment on Raleigh et al 2014]

Media:

Media coverage of *Global non-linear effect on temperature on economic output* (2015): Economist, NPR, Wall Street Journal, Washington Post, Financial Times, CBS, Time, Wired, Bloomberg, among others.

Media coverage of *Quantifying the influence of climate on human conflict* (2013): Economist, NPR, Wall Street Journal, BBC, CNN, the Atlantic, Washington Post, Time, National Geographic, The Onion, among others.

Media coverage of *Warming increases the risk of civil war in Africa* (2009): Economist, CNN, BBC, among others.