

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*
- Large economic benefits to limiting warming to 1.5C (with Matt Davis and Noah Diffenbaugh)
- One in five infant deaths in Africa attributable to poor air quality (with Sam Heft-Neal, Jen Burney, and Eran Bendavid)
- Effect of ambient temperature on suicide in the US and Mexico (with Felipe Gonzalez, Patrick Baylis, Sam-Heft Neal, Ceren Baysan, 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. *PNAS* 114(9), 2189-2194.
2. Sam Heft-Neal, David Lobell, and Marshall Burke. 2017. Using remotely sensed temperature to estimate climate response functions. *Environmental Research Letters* 12(1) 014013.
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.

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