

Tamma Carleton

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Education

Ph.D. Agricultural & Resource Economics, University of California, Berkeley, 2018.
M.S. Agricultural & Resource Economics, University of California, Berkeley, 2015.
M.Sc. Economics for Development, University of Oxford, 2013. *Distinction*
M.Sc. Environmental Change & Management, University of Oxford, 2012. *Distinction*.
B.A. Economics (honors), Lewis & Clark College, 2009. *Summa cum laude*.

Academic positions

Assistant Professor, University of California Santa Barbara, Bren School of Environmental Science & Management, 2020–
Postdoctoral Scholar, Energy Policy Institute at the University of Chicago, 2018–2020

Affiliations

Research Advisor, Bank for International Settlements [Research Network on the Macroeconomic Implications of Climate Change and Environmental Degradation](#), 2023–2024
Standing Committee Member, National Academies of Sciences, Engineering, and Medicine [Environmental Health Matters Initiative](#), 2023–
Director, Energy & Climate Program, Environmental Market Solutions Lab ([emLab](#)), Bren School of Environmental Science & Management, UC Santa Barbara, 2023–
Faculty Affiliate, [Center for Responsible Machine Learning](#), UC Santa Barbara, 2023–
Faculty Affiliate, UC Santa Barbara Department of Economics, 2023–
Faculty Research Fellow, National Bureau of Economic Research (NBER), program on Environment and Energy Economics, 2021–
Member, [The Coase Project](#), London School of Economics & University of Chicago, 2021–
Faculty Affiliate, Center for Effective Global Action ([CEGA](#)), UC Berkeley, 2021–
Beijer Young Scholar, Beijer Institute, Royal Swedish Academy of Science, 2019–
Member, [Climate Impact Lab](#), 2014–
Doctoral Fellow, [Global Policy Lab](#), Goldman School of Public Policy, 2014–2018
Visiting Scholar, [Energy Policy Institute at the University of Chicago](#), 2017

Peer-reviewed publications

Carleton, T., and M. Greenstone. “A Guide to Updating the United States Government’s Social Cost of Carbon.” *Review of Environmental Economics and Policy* (2022) [link](#)
Carleton, T., A.S. Jina, M. Delgado, M. Greenstone, T. Houser, S.M. Hsiang, A. Hultgren, R.E. Kopp, K. McCusker, I. Nath, J. Rising, A. Rode, H.K. Seo, A. Viaene, J. Yuan, and A.T. Zhang. “Valuing the global mortality consequences of climate change accounting for adaptation costs and benefits.” *Quarterly Journal of Economics* (2022) [link](#)

Links to [data](#) and [code](#)

Rode, A., **T. Carleton**, M. Delgado, M. Greenstone, T. Houser, S. Hsiang, A. Hultgren, A. Jina, R. Kopp, K. McCusker, and I. Nath. “Estimating a social cost of carbon for global energy consumption.” *Nature* (2021) [link](#)

Links to [data](#) and [code](#)

Rolf, E.* , J. Proctor* , **T. Carleton*** , I. Bolliger* , V. Shankar* , M. Ishihara, B. Recht, and S. Hsiang. “A generalizable and accessible approach to machine learning with global satellite imagery” *Nature Communications* (2021) [link](#) (*equal contribution)

[Project website](#) (links to code, replication data, tutorials, and other resources)

Carleton, T., J. Cornetet, P. Huybers, K. Meng, and J. Proctor. “Global evidence for ultraviolet radiation decreasing COVID-19 growth rates” *Proceedings of the National Academy of Sciences* (2020) [link](#)

[Code and data repository](#)

Auffhammer, M. and **T. Carleton**. “Regional Crop Diversity and Weather Shocks in India.” *Asian Development Review* (2018): 35(2), 113-130. [link](#)

Carleton, T. “Reply to Plewis, Murari et al., and Das: The suicide–temperature link in India and the evidence of an agricultural channel are robust.” *Proceedings of the National Academy of Sciences* (2018): 115(2), E118-E121. [link](#)

Carleton, T. “Crop-damaging temperatures increase suicide rates in India.” *Proceedings of the National Academy of Sciences* (2017) [link](#)

Carleton, T. and S.M. Hsiang, “Social and economic impacts of climate.” *Science* (2016) DOI: [link](#)

Carleton, T., S.M. Hsiang, and M. Burke. “Conflict in a changing climate.” *The European Physical Journal Special Topics* 225.3 (2016): 489-511 DOI: [link](#)

Selected works in progress

Zhang, P.,* **T. Carleton**,* L. Lin, and M. Zhou. “Improvements in air quality lower China’s suicide rate” (*revise & resubmit*) (*equal contribution)

Boser, A., K. Caylor, A. Larsen, M. Pascolini-Campbell, J.T. Reager, and **T. Carleton**. “Field-scale crop water consumption estimates reveal potential water savings in California agriculture” (*revise & resubmit*)

Abajian, A.,* **T. Carleton**,* K.C. Meng,* and O. Deschenes. “The Climate Adaptation Feedback” (*revise & resubmit*) (*equal contribution)

Hultgren, A., **T. Carleton**, M. Delgado, D. Gergel, M. Greenstone, T. Houser, S. Hsiang, A. Jina, R.E. Kopp, K.E. McCusker, T. Mayer, I. Nath, J. Rising, A. Rode, J. Yuan. “Estimating global impacts to agriculture from climate change accounting for adaptation” [link](#) (*revise & resubmit*)

Rode, A., R. Baker, **T. Carleton**, A. D’Agostino, M. Delgado, T. Foreman, D. Gergel, M. Greenstone, T. Houser, S. Hsiang, A. Hultgren, A. Jina, R.E. Kopp, S.B. Malevich, K.E. McCusker, I. Nath, M. Pecenco, J. Rising, and J. Yuan. “Is workplace temperature a valuable job amenity? Implications for climate change” (*under review*)

Proctor, J., **T. Carleton**, and S. Sum. “Parameter recovery with remotely sensed variables” (*under review*) [link](#) (author order randomized)

Carlson, C.,* **T. Carleton**,* R. Odoulami, and C. Trisos. “The historical fingerprint and future impact of climate change on childhood malaria in Africa” [link](#) (*in prep.*) (*equal contribution)

Carleton, T., L. Crews and I. Nath. “Agriculture, trade, and the spatial efficiency of global water use” (*in prep.*) [link](#)

Carleton, T. “The global water footprint of distortionary agricultural policy” (*in prep.*)

Reviewed conference papers

Bolliger, I., T. Carleton, S.M Hsiang, J. Kadish, J. Proctor, B. Recht, E. Rolf, and V. Shankar “Ground Control to Major Tom: The importance of field surveys in remotely sensed data analysis.” *Conference Proceedings, Data For Good Exchange* (2017) [link](#)

Teaching & other work experience

Instructor, EDS222: Statistics for Environmental Data Science, Bren School of Environmental Science & Management, UC Santa Barbara, 2021, 2022, 2023

Instructor, ESM204: Environmental Economics, Bren School of Environmental Science & Management, UC Santa Barbara, 2021, 2022, 2023

Faculty Advisor, Masters of Environmental Data Science Capstone Projects, Bren School of Environmental Science & Management, UC Santa Barbara, 2022, 2023

Graduate Student Researcher, Goldman School of Public Policy, 2014–2018.

Graduate Student Instructor, PP275: Spatial Data Analysis, Goldman School of Public Policy, 2016.

Course co-designer and co-instructor (with Solomon Hsiang): Summer Workshop on Climate Econometrics at UC Berkeley, 2015.

Graduate Student Researcher, Agricultural & Resource Economics, 2013–2014.

Research Analyst, Bureau of Economics, United States Federal Trade Commission, 2009–2011.

Invited talks

- 2023** California Institute of Technology Center for Science, Society, and Public Policy, Stanford University Preparing for a Changing Climate Conference, 2023 Workshop on Trade, Spatial Economics, and the Environment, CEGA MeasureDev 2023, Bank for International Settlements Green Swan Conference 2023, Bank for International Settlements Research Network Seminar Series, National Academies of Sciences, Engineering, and Medicine Workshop on Incorporating Climate into Macroeconomic Modeling, American Economic Association Annual Meeting, Arizona State University, The World Bank, Pennsylvania State University Ashtekar Frontiers in Science Lecture Series, Latin American and Caribbean Economic Association (LACEA) Annual Meeting, University of Delaware Department of Marine Science & Policy, Reserve Bank of Australia & Australian Treasury Department Climate Economics Seminar Series
- 2022** Association of Environmental and Resource Economics Environmental Justice Workshop, London School of Economics Environment Week, The Coase Project, Resources for the Future, University of London, London School of Economics, MIT-Columbia-Cornell Energy & Environmental Economics Seminar, Indian Statistical Institute, George Washington University, Association of Allied Social Sciences (ASSA) Annual Conference, Colby College, The Israel Society of Ecology and Environmental Sciences, American Geophysical Union
- 2021** Paris School of Economics, Stanford University Asia Health Policy Program, Federal Reserve Bank of San Francisco Virtual Seminar on Climate Economics, National Bureau of Economic Research EEE Spring Meeting, Western Economic Association International Annual Conference, Climate Change AI Seminar, CEGA MeasureDev Conference, Institute for Mathematical and Statistical Innovation, Montana State University Workshop on Local and State Resiliency to a Changing Climate, Columbia Seminar on Planetary Management, ISIMIP Workshop Keynote Address, University of New Mexico Economics Department
- 2020** Berkeley/Harvard/Yale Environmental & Energy Economics Seminar, UC Los Angeles Luskin Center for Innovation, CGIAR Big Data Platform, Online Agricultural and Resource Economics Seminar, UC Davis Conference on Big Agricultural Data, Energy Policy Institute at the University of Chicago, Mansueto Institute for Urban Innovation at the University of Chicago
- 2019** Indiana University, University of Minnesota, Energy Policy Institute at the University of Chicago, Norwegian Ministry of Climate and Environment

- 2018** American Geophysical Union, University of California Santa Barbara Bren School of Environmental Science & Management, Stanford University Center on Food Security & Environment, University of San Francisco, University of Wisconsin-Madison, National Socio-Environmental Synthesis Center
- 2017** Potsdam Institute for Climate Impact Research Impacts World Conference, National Bureau of Economic Research EEE Summer Institute (egg timer), UC Berkeley Development Seminar, National Socio-Environmental Synthesis Center, Columbia University Interdisciplinary Ph.D. Workshop in Sustainable Development
- 2016** National Socio-Environmental Synthesis Center, Energy Policy Institute at the University of Chicago, Pacific Conference for Development Economics
- 2015** MIT Graduate Climate Conference, Columbia University Interdisciplinary Ph.D. Workshop in Sustainable Development

Awards

- SDG Digital Gamechangers Award, United Nations Development Programme and the International Telecommunication Union, 2023
- Distinguished Teaching Award, Bren School of Environmental Science & Management, 2022
- Encyclopedia Britannica's 20 under 40: Young Shapers of the Future (Academia and Ideas), 2021
- Agricultural & Applied Economics Association Outstanding Doctoral Dissertation Award, 2019
- Beijer Institute of Ecological Economics Young Scholar, 2019
- Editor's Citation for [Excellence in Refereeing](#), *Geophysical Research Letters*, 2018
- The Top 30 Thinkers Under 30, *Pacific Standard*, 2017
- EPA Science to Achieve Results (STAR) Graduate Fellowship, 2016–2018.
- Rhodes Scholarship, 2011–2013.
- George Webb Medley Prize for best performance in development economics, University of Oxford, 2013.
- National Science Foundation Graduate Research Fellowships Program (NSF GRFP), 2011 (*declined*).
- National Collegiate Athletic Association (NCAA) Postgraduate Scholarship, 2009.

Grants

- Support for emLab's Climate & Energy Program, Heising-Simons Foundation, 2023 (\$50,000)
- "Green Water Economics", Global Commission on the Economics of Water, 2023 (\$150,000)
- "Data-driven estimates of wildfire hazard on climate impacts in California", CA Air and Resources Board, 2023 (\$150,000)
- "The global mental health burden of historical climate change", Center for Effective Global Action, 2022 (\$10,000)
- "Adapting to climate change through the globalization of freshwater resources", UCSB Regents' Junior Faculty Fellowship, 2022 (\$8,000)
- "Drought and environmental justice: evidence from farmworker communities in the Central Coast of California", UCSB Blum Center, 2022 (\$10,000)
- "The global water consequences of agricultural adaptation to climate change", UCSB Research Assistance Program, 2021 (\$8,000)
- "Impacts of climate change on vulnerable populations across California", CA Air and Resources Board, 2021 (\$200,000)
- "Innovative measurement tools for resource-poor settings", USAID / UC Berkeley Development Innovation Lab, co-PI, 2021 (\$290,000)

“Environmental Justice and Environmental Markets”, Environmental Defense Fund (EDF), 2021, (\$350,000 w. C. Costello and K. Meng)

“Climate Vulnerability Metric for Disadvantaged Communities in California”, California Air and Resources Board (CARB), 2021, (\$200,000)

Amazon Web Services Cloud Credits for Research, 2016, (\$50,000 w. S. Hsiang, B. Recht, V. Shankar, E. Rolf, J. Proctor)

EPA Science to Achieve Results (STAR) Graduate Fellowship, 2016, (\$132,000)

“Indian Climate Early Warning System”, International Growth Center, 2015, (GBP 106,003, as researcher w. M. Greenstone, S. Hsiang, A. Jina, R. Kopp, A. Rode)

“Food Security and Social Stability in Africa”, International Growth Center, 2015, (GBP 99,091, as researcher w. M. Greenstone, S. Hsiang, A. Jina, R. Kopp, A. Rode)

Service

Contributing Author, Intergovernmental Panel on Climate Change 6th Assessment Report (Chapters 16 and 9), 2020–2022.

Co-organizer, The Workshop in Environmental Economics and Data Science ([TWEEDS](#)), 2021, 2022, 2023

Co-organizer, Institute for Mathematical and Statistical Innovation’s Conference on Economic Impacts of Climate Change, 2022

Co-organizer, National Bureau of Economic Research Summer Institute, Energy and Environmental Economics, 2023

Referee, *American Economic Review*, *Science*, *Proceedings of the National Academy of Sciences*, *Nature Food*, *Nature Communications*, *Journal of Public Economics*, *Journal of Development Economics*, *Journal of Environmental Economics and Management*, *Journal of Environmental and Resource Economics*, *Journal of the Association of Environmental and Resource Economists*, *Journal of Political Economy Microeconomics*, *Journal of Human Resources*, *American Economic Journal: Applied Economics*, *Journal of Political Economy: Microeconomics*, *Journal of Health Economics*, *American Journal of Agricultural Economics*, *Nature Climate Change*, *Climatic Change*, *Climate Change Economics*, *Science Advances*, *Journal of Econometrics*, *American Journal of Political Science*, *European Economic Review*, *Environmental and Resource Economics*, *Geophysical Research Letters*, *Regional Environmental Change*, *World Development*, *Journal of Development Studies*, *Journal of Central Banking*, *Conservation Letters*, *Journal of Peace Research*.

Reviewer, *The Risks and Costs of Climate Change* by Gary Yohe

Member, Women in Economics at Berkeley, 2017–2018.

Member, Board of Directors, Resonate Workshops, Kigali, Rwanda, 2015–2018.

Co-founder, Oxford Food Security Forum, Oxford, UK, 2011–2013.

Miscellaneous

PhD advisors: Maximilian Auffhammer (Agricultural & Resource Economics, UC Berkeley), Solomon Hsiang (Goldman School of Public Policy, UC Berkeley)

Computing: R, Stata, MATLAB, Python, L^AT_EX, Adobe Illustrator

Citizenship: USA