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 Berkeley, Agricultural & Resource Economics, 2024–

Assistant Professor, University of California Santa Barbara, Bren School of Environmental Science & Management, 2020–2024

Postdoctoral Scholar, Energy Policy Institute at the University of Chicago, 2018–2020

Affiliations

Economic Advisory Council Member, Environmental Defense Fund, 2026–

Standing Committee Member, National Academies of Sciences, Engineering, and Medicine Environmental Health Matters Initiative, 2023–2025

Faculty Advisor, Center for Effective Global Action (CEGA), UC Berkeley, 2024–

Faculty Head of Research, Climate Impact Lab, 2025– (Member, 2014–2024)

Research Associate, Environmental Market Solutions Lab (emLab), Bren School of Environmental Science & Management, UC Santa Barbara, 2025– (Director, Energy & Climate Program, 2023–2024)

Research Advisor, Bank for International Settlements Research Network on the Macrofinancial Implications of Climate Change and Environmental Degradation, 2023-2024

Faculty Research Fellow, National Bureau of Economic Research (NBER), program on Environment and Energy Economics, 2021–

Beijer Young Scholar, Beijer Institute, Royal Swedish Academy of Science, 2019–

Publications

Betti, L., F. Sanni, G.Z. Sogoyou, T. Agbagla, C. Molitor, **T. Carleton**, and E. Rolf. "Mapping on a budget: Optimizing spatial data collection for machine learning" *Proceedings of the AAAI Conference on Artificial Intelligence* (2026) link

Molitor, C., J. Cohen, G. Lewin, S. Cognac, P. Hadunka, J. Proctor and **T. Carleton**. "Monitoring maize yield variability over space and time with unsupervised satellite imagery features" *Remote Sensing* (2025) link

Carlson, C., D. Mitchell, R. Gibb, R.F. Stuart-Smith, **T. Carleton**, T.E. Lavelle, C.A. Lippi, M. Lukas-Sithole, M.A. North, S.J. Ryan, D.S. Shumba, M. Chersich, M. New and C.H. Trisos. "Health losses attributed to anthropogenic climate change" *Nature Climate Change* (2025) link

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, and J. Yuan. "Impacts of climate change on global agriculture accounting for adaptation" *Nature* (2025) link

Link to data and code

Abajian, A.,* **T. Carleton**,* K. Meng,* and O. Deschênes. "Quantifying the global climate feedback from energy-based adaptation" *Nature Communications* (2025) (*equal contribution) link

Carleton, T., B. K. Jack, E. Duflo, and G. Zappala. "Adaptation to climate change" *Handbook of the Economics of Climate Change* (2024) link

Liddell, T., A. Boser, S. Orofino, T. Mangin, and **T. Carleton**. "stagg:: a data pre-processing R package for climate impacts analysis" *Environmental Modelling and Software* (2024)

Links to paper and R package

Carleton, T., L. Crews, and I. Nath. "Is the world running out of fresh water?" *AEA Papers and Proceedings* (2024) link

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" *Nature Communications* (2024) link

Zhang, P.,* **T. Carleton**,* L. Lin, and M. Zhou. "Improvements in air quality lower China's suicide rate" *Nature Sustainability* (2024) (*equal contribution) link

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

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

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

Proctor, J., **T. Carleton**, and S. Sum. "Parameter recovery with remotely sensed variables" (*conditionally accepted, Journal of the Association of Environmental and Resource Economics*) 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 (*revise & resubmit, Nature*) (*equal contribution)

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" (*revise & resubmit, Journal of Political Economy*)

Christensen, D., **T. Carleton**, E. Rolf, C. Molitor, S. Biswas, K. Yan, and G. Blair. "Estimating the Footprint of Artisanal Mining in Africa" link (*under review*)

Carleton, T., L. Crews and I. Nath. "Agriculture, trade, and the spatial efficiency of global water use" (*under review*) link

Other writing

Carleton, T., E. Duflo, B.K. Jack, and G. Zappalà. "The economics of climate adaptation: From academic insights to effective policy" *VoxEU* (2025) link

Carleton, T. as key expert to the *Global Commission on the Economics of Water*."The Economics of Water: Valuing the Hydrological Cycle as a Global Common Good (Chapter 3)" link

Carleton, T., K. Arguedas, H. Hess, S. Klos, S.B. Malevich, K. McCusker, M. Sehaumpai, H. Tavarez, and E. Wimberger. "California Air Resources Board 2022 Scoping Plan: The Climate Vulnerability Metric" *California Air and Resources Board* (2022) link

Teaching

Instructor, EEP101: Environmental Economics, Agricultural & Resource Economics, UC Berkeley, 2025

Instructor, ARE241: Agricultural Economics and Policy, Agricultural & Resource Economics, UC Berkeley, 2025

Instructor and course designer, Data Science Capacity in Africa Training Program, UC Santa Barbara, 2025

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, 2024

Faculty Advisor, Masters of Environmental Science & Management Group Projects, Bren School of Environmental Science & Management, UC Santa Barbara, 2024

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

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

Keynotes and public lectures

Keynote, Data Science for Development, 2026

Keynote, IZA Workshop on Climate and Environmental Economics, 2025

Master class, The Occasional Workshop in Environmental & Resource Economics, 2025

Keynote, MeasureDev: Mitigating the Risks and Impacts of Climate Change, World Bank and CEGA, 2023

Ashtekar Frontiers in Science Public Lecture, Pennsylvania State University, 2023

Keynote, Israel Society of Ecology and Environmental Sciences (ISEES) 50th Annual Conference for Science and the Environment, 2022

Plenary lecture, London School of Economics Environment Week, 2022

Keynote, ISIMIP Annual Workshop, 2021

Invited seminars and other talks

2026 UC Berkeley Energy & Resources Group Colloquium, American Economic Association Annual Meeting

2025 World Bank Climate Economics Seminar, Agricultural & Applied Economics Association Annual Meeting, University of Exeter, NeuroClimate Working Group, Berkeley Summer School in Environmental and Energy Economics, Resources for the Future Workshop: Charting the Future Research Agenda for the Social Cost of Carbon, International Health Economics Association

2024 National Bureau of Economic Research EEE Summer Institute, Society for Economic Dynamics Annual Meeting, University of Michigan Ford School of Public Policy, University of Chicago Harris School of Public Policy, UC Berkeley Agricultural and Resource Economics, California Institute of Technology, American Economic Association Annual Meeting, The Coase Project, Global Mental Health Action Network

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, Bank for International Settlements Green Swan Conference 2023, Bank for International Settlements Research Network Seminar Series, National Academies of Sciences, University of California, Davis, University of Delaware School of Marine Science & Policy, BREAD-IGC Online PhD Course in Environmental Economics, Engineering, and Medicine Workshop on Incorporating Climate into Macroeconomic Modeling, American Economic Association Annual Meeting, Arizona State University, The World Bank, 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, Central Bank of Chile

2022 Association of Environmental and Resource Economics Environmental Justice Workshop, 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, American Geophysical Union, Berkeley Summer School in Environmental and Energy Economics

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 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, 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

"Institutionalizing Data Science for Development in Togo and Beyond", Google.org, 2026

"Assessing Climate Vulnerability across the Bay Area", Tipping Point Community, 2025

"Cultivating Data Science Capacity in Africa: Piloting a Data Lab in Togo", Fund for Innovation in Development and the McGovern Foundation, 2024 (w. CEGA)

"Strengthening and expanding project management and research in the energy and climate program at the Environmental Markets Lab (emLab)", Sloan Foundation, 2024 (w. emLab)

Support for emLab's Climate & Energy Program, Heising-Simons Foundation, 2023 (w. emLab)

"Green Water Economics", Global Commission on the Economics of Water, 2023

"Data-driven estimates of wildfire hazard on climate impacts in California", CA Air and Resources Board, 2023

"Environmental Justice and Environmental Markets: Examining the strengths and weaknesses of market mechanisms in their ability to deliver equitable social and environmental outcomes", Environmental Defense Fund, 2022 (w. Kyle Meng)

"The global mental health burden of historical climate change", Center for Effective Global Action, 2022

"Adapting to climate change through the globalization of freshwater resources", UCSB Regents' Junior Faculty Fellowship, 2022

"Drought and environmental justice: evidence from farmworker communities in the Central Coast of California", UCSB Blum Center, 2022

"The global water consequences of agricultural adaptation to climate change", UCSB Research Assistance Program, 2021

"Impacts of climate change on vulnerable populations across California", CA Air and Resources Board, 2021

"Innovative measurement tools for resource-poor settings", USAID / UC Berkeley Development Innovation Lab, 2021 (w. CEGA)

"Environmental Justice and Environmental Markets", Environmental Defense Fund (EDF), 2021 (w. Chris Costello and Kyle Meng)

"Climate Vulnerability Metric for Disadvantaged Communities in California", California Air and Resources Board (CARB), 2021

Amazon Web Services Cloud Credits for Research, 2016 (w. Sol Hsiang, Jon Proctor, Ben Recht, Esther Rolf, and Vaishaal Shankar)

EPA Science to Achieve Results (STAR) Graduate Fellowship, 2016

"Indian Climate Early Warning System", International Growth Center, 2015, (w. Michael Greenstone, Sol Hsiang, Amir Jina, Robert Kopp, and Ashwin Rode)

"Food Security and Social Stability in Africa", International Growth Center, 2015, (w. Michael Greenstone, Sol Hsiang, Amir Jina, Robert Kopp, and Ashwin Rode)

Service

Advisory Council member, 5^{th} California Climate Assessment, 2025

Conference co-organizer, The Workshop in Environmental Economics and Data Science (TWEEDS), 2021, 2022, 2023, 2025

Conference co-organizer, National Bureau of Economic Research Summer Institute, Energy and Environmental Economics, 2023 and Spring Institute, 2026

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

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

Program committee, LSE Annual Workshop on Environmental Economics / Environment Week, 2022

Referee, *Quarterly Journal of Economics*, *Journal of Political Economy*, *American Economic Review*, *Review of Economics and Statistics*, *Science*, *Proceedings of the National Academy of Sciences*, *Nature Food*, *Nature Communications*, *Journal of Public Economics*, *Journal of Development Economics*, *Economic Journal*, *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*, *American Economic Review: Insights*, *Journal of Health Economics*, *American Journal of Agricultural Economics*, *Nature Climate Change*, *Nature Sustainability*, *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, Environmental Law Institute's Climate Judiciary Project