

Katherine (Katie) Dagon

National Center for Atmospheric Research
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EDUCATION

Harvard University	Cambridge, MA
Ph.D., Earth and Planetary Sciences	2017
A.M., Earth and Planetary Sciences	2015
Brown University	Providence, RI
B.S., Mathematics-Physics, graduation with Honors	2010

PROFESSIONAL APPOINTMENTS

National Center for Atmospheric Research	Boulder, CO
Project Scientist I, Climate and Global Dynamics	2019-present
Advanced Study Program (ASP) Postdoctoral Fellow	2017-2019
Harvard University	Cambridge, MA
Graduate Research Assistant, Department of Earth and Planetary Sciences	2011-2017
United Technologies	South Windsor, CT
NASA-UTC Internship Program	2010
Brown University	Providence, RI
Undergraduate Research Assistant, Department of Physics	2009-2010
State of Connecticut Department of Energy and Environmental Protection	Hartford, CT
Seasonal Resource Assistant	2007, 2008, & 2010-2011

PEER-REVIEWED PUBLICATIONS

Dagon, K., B.M. Sanderson, R.A. Fisher, D.M. Lawrence (2020), A machine learning approach to emulation and biophysical parameter estimation with the Community Land Model, version 5. *Advances in Statistical Climatology, Meteorology and Oceanography*, **6**, 223-244, <https://doi.org/10.5194/ascmo-6-223-2020>.

Prabhat, K. Kashinath, M. Mudigonda, S. Kim, L. Kapp-Schwoerer, A. Graubner, E. Karaismailoglu, L. von Kleist, T. Kurth, A. Greiner, K. Yang, C. Lewis, J. Chen, A. Lou, S. Chandran, B. Toms, W. Chapman, **K. Dagon**, C.A. Shields, T. O'Brien, M. Wehner, and W. Collins (2020), ClimateNet: an expert-labelled open dataset and Deep Learning architecture for enabling high-precision analyses of extreme weather. *Geoscientific Model Development Discussions*, accepted, <https://doi.org/10.5194/gmd-2020-72>.

Xu, Y., L. Lin, S. Tilmes, **K. Dagon**, L. Xia, C. Diao, W. Cheng, Z. Wang, I. Simpson, and L. Burnell (2020), Climate engineering to mitigate the projected 21st-century terrestrial drying of the Americas: a direct comparison of carbon capture and sulfur injection. *Earth System Dynamics*, **11**, 673-695, <https://doi.org/10.5194/esd-11-673-2020>.

Cheng, W., D.G. MacMartin, **K. Dagon**, B. Kravitz, S. Tilmes, J.H. Richter, M.J. Mills, and I.R. Simpson (2019), Soil Moisture and Other Hydrological Changes in a Stratospheric Aerosol Geoengineering Large Ensemble. *Journal of Geophysical Research: Atmospheres*, **124**, 12773-12793, <https://doi.org/10.1029/2018JD030237>.

Kravitz, B., D.G. MacMartin, S. Tilmes, J.H. Richter, M.J. Mills, W. Cheng, **K. Dagon**, A.S. Glanville, J.-F. Lamarque, I.R. Simpson, J.J. Tribbia, and F. Vitt (2019), Comparing Surface and Stratospheric

Impacts of Geoengineering with Different SO₂ Injection Strategies. *Journal of Geophysical Research: Atmospheres*, 124, 7900-7918, <http://dx.doi.org/10.1029/2019JD030329>.

Dagon, K., and D.P. Schrag (2019), Quantifying the effects of solar geoengineering on vegetation. *Climatic Change*, 153, 235-251, <http://dx.doi.org/10.1007/s10584-019-02387-9>.

Dagon, K., and D.P. Schrag (2017), Regional Climate Variability under Model Simulations of Solar Geoengineering. *Journal of Geophysical Research: Atmospheres*, 122, 12106-12121, <http://dx.doi.org/10.1002/2017JD027110>.

Dagon, K., and D.P. Schrag (2016), Exploring the Effects of Solar Radiation Management on Water Cycling in a Coupled Land-Atmosphere Model. *Journal of Climate*, 29, 2635-2650, <http://dx.doi.org/10.1175/JCLI-D-15-0472.1>.

Tobias, S.M., **K. Dagon**, and J.B. Marston (2011), Astrophysical Fluid Dynamics via Direct Statistical Simulation. *The Astrophysical Journal*, 727, 127, <http://dx.doi.org/10.1088/0004-637X/727/2/127>.

SELECTED AWARDS & FELLOWSHIPS

NCAR CISL Special Recognition Award for AI4ESS	2020
Andrew Slater Award, NCAR Land Model Working Group Meeting	2019
NCAR Advanced Study Program Postdoctoral Fellowship	2017
Presidential Management Fellowship Finalist	2017
Certificate of Teaching Excellence, Bok Center for Teaching & Learning	2014, 2016
Duff Family Endowed Graduate Support Fund, Harvard University	2013-2014
Graduate Consortium Fellowship, Harvard University Center for the Environment	2012-2013
Brown University Undergraduate Research and Teaching Award	2009

INVITED TALKS & SEMINARS

Lawrence Berkeley National Laboratory	Berkeley, CA
National Energy Research Scientific Computing Center Seminar	November 2019
Pennsylvania State University	State College, PA
Department of Meteorology and Atmospheric Science Colloquium	February 2019
American University	Washington, DC
Department of Environmental Science Seminar	February 2019
Indiana University	Bloomington, IN
Department of Earth and Atmospheric Sciences Colloquium	January 2019
Pennsylvania State University	State College, PA
Department of Geography Seminar	January 2019
University of Washington	Seattle, WA
Department of Atmospheric Sciences Seminar	July 2018

SELECTED CONFERENCE PRESENTATIONS (*invited)

Dagon, K., M. Molina, J. Truesdale, J. Caron, and J. Meehl, Applying Machine Learning to Associate Precipitation Extremes with Synoptic-Scale Weather Events. *American Geophysical Union Fall Meeting*, virtual, oral presentation, December 2020.

***Dagon, K.**, B.M. Sanderson, R. Fisher, and D.M. Lawrence, Bayesian Calibration with Neural Network-Based Emulation of a Land Model. *American Geophysical Union Fall Meeting*, virtual, oral presentation, December 2020.

Dagon, K., J. Caron, J. Meehl, M. Molina, and J. Truesdale, Applying Machine Learning to Associate Precipitation Extremes with Synoptic-Scale Weather Events. *DOE RGMA PI Meeting*, virtual, oral presentation, October 2020.

***Dagon, K.**, B.M. Sanderson, R. Fisher, and D.M. Lawrence, Quantifying Uncertainty in Climate Predictability Using Perturbed Physics Ensembles and Climate Model Emulation. *American Physical Society March Meeting*, Denver, CO, oral presentation, March 2020 [canceled due to COVID-19].

Dagon, K., B.M. Sanderson, R. Fisher, and D.M. Lawrence, A Machine Learning Approach to Quantify Land Model Parameter Uncertainty. *American Geophysical Union Fall Meeting*, San Francisco, CA, oral presentation, December 2019.

Dagon, K., R. Fisher, D.M. Lawrence, and B.M. Sanderson, Machine Learning for Parameter Estimation in CLM5. *CESM Land Model Working Group Meeting*, Boulder, CO, oral presentation, February 2019.

Dagon, K., R. Fisher, D.M. Lawrence, and B.M. Sanderson, Reducing Uncertainty in Land Surface Models. *American Geophysical Union Fall Meeting*, Washington, DC, oral presentation, December 2018.

Dagon, K., R. Fisher, D.M. Lawrence, and B.M. Sanderson, Moving Towards a Global Biogeophysical Parameter Optimization for CLM5. *Community Earth System Model Workshop*, Boulder, CO, oral presentation, June 2018.

Dagon, K., and D.P. Schrag, Effects of Solar Geoengineering on Vegetation: Implications for Biodiversity and Conservation. *American Geophysical Union Fall Meeting*, New Orleans, LA, oral presentation, December 2017.

Dagon, K., and D.P. Schrag, Regional Climate Variability under Model Simulations of Solar Geoengineering. *Gordon Research Conference: Climate Engineering*, Newry, ME, poster presentation, July 2017.

Dagon, K., Soil Moisture-Climate Coupling under Model Simulations of Solar Geoengineering. *Community Earth System Model Workshop*, Breckenridge, CO, oral presentation, June 2016.

OTHER TALKS & SEMINARS

“Machine Learning for Climate Science,” *Weiqing Han CU Boulder group meeting*, Boulder, CO, October 2020 [held virtually due to COVID-19].

“Research on Climate Science and Climate Modeling,” *Oglala Lakota Tribal College groundwater course*, Pine Ridge Indian Reservation, SD, April 2020 [held virtually due to COVID-19].

“Research on Geoengineering, or Climate Intervention Strategies,” *Watershed High School climate change course*, Boulder, CO, March 2020 [held virtually due to COVID-19].

“Machine Learning for Climate Science,” *UCAR/NCAR Exhibit Hall Booth at AGU*, San Francisco, CA, December 2019.

“Exploring Machine Learning to Reduce Uncertainty in a Land Surface Model,” *NCAR/UCP Science & Discovery Day*, Boulder, CO, May 2019.

TEACHING EXPERIENCE

National Center for Atmospheric Research	Boulder, CO
Lecturer, AGU Tutorial on Machine Learning and Deep Learning	2020
Lecturer, Artificial Intelligence for Earth System Science (AI4ESS) Summer School	2020
Instructor, Community Terrestrial Systems Model Tutorial	2019

Harvard University

Cambridge, MA

Teaching Fellow, Department of Earth and Planetary Sciences

2013-2016

- The Consequences of Energy Systems (graduate level, Fall 2015 and Fall 2016)
- The Climate-Energy Challenge (undergraduate level, Fall 2014, Fall 2015 and Fall 2016)
- The Fluid Earth (undergraduate level, Spring 2013)

Brown University

Providence, RI

Teaching Assistant, Department of Mathematics

2009

Math Peer Tutor, Brown University Tutoring Program

2008

ACADEMIC SERVICE AND LEADERSHIP

NCAR CGD Earth System Data Science cross-section theme co-lead	2020 -
NCAR Climate and Global Dynamics Seminar Series Coordinator	2020 -
Co-Chair, Gordon Research Seminar on Climate Engineering (originally 2020, postponed to 2022 due to COVID-19)	2019 -
Physics of Climate Executive Committee, American Physical Society	2019 -
Postdoctoral Fellows Networking Committee, National Center for Atmospheric Research	2017-2019
Physics of Climate Program Committee, American Physical Society	2017-2018
Plants and Climate Seminar Series Organizer, Harvard University	2015-2016
Agassiz Visiting Lecturer Committee, Harvard University	2013-2014
Summer School on Geoengineering Organizing Committee, Harvard University	2013
Harvard Graduate Consortium on Energy and Environment	2012-2015
<i>Journal Reviewer</i> : Atmospheric Chemistry and Physics, Earth's Future, Geoscientific Model Development, Journal of Hydrometeorology	

MENTORING

Kingston High School Science Research Mentor	2020 -
UCAR Next Generation Fellowship Research Mentor	2019-2020
NCAR SOARS Internship Program Community Mentor	2018
Harvard College Women's Center WISTEM Mentor	2016-2017
Intel Science Research Program High School Student Mentor	2014-2015
Harvard Graduate Women in Science and Engineering Mentoring Program	2011-2013
Brown University Women's Launch Pad Mentoring Program	2009-2010

PUBLIC ENGAGEMENT

WOW Children's Museum Girls in Science Night, Lafayette, CO	2020
NCAR Traveling Climate Exhibit Scientific Team, Boulder, CO	2019
PBS Digital Studios Scientific Consultant	2018-2019
USA Science and Engineering Festival, Washington, DC	2018
Project Bridge Colorado Science Day at the State Capitol, Denver, CO	2018
Twin Peaks Charter Academy Guest Scientist, Longmont, CO	2017
NCAR Super Science Saturday, Boulder, CO	2017-2019
Harvard GSAS Science Policy Group Trip, Washington, DC	2016
There's a Scientist in My Classroom! Guest Lecturer, Danvers, MA	2014
Science in the News Event Organizer and Lecturer, Boston, MA	2013-2016

SCIENCE WRITING

Dagon, K., "Engineering the Earth to Fight Climate Change," *Science in the News Blog*, 25 October 2016, <http://sitn.hms.harvard.edu/flash/2016/engineering-earth-fight-climate-change>.

Dagon, K., "Climate Change 2016: Make America Hot Again," *Science in the News Blog*, 9 August 2016, <http://sitn.hms.harvard.edu/flash/2016/climate-change-2016-make-america-hot>.

Dagon, K., “Science by the Pint,” *The Plainspoken Scientist*, Student Blog Series, 18 July 2016, <http://blogs.agu.org/sciencecommunication/2016/07/18/science-by-the-pint>.

Dagon, K., “Pausing to Talk About Climate Change,” *Science in the News Blog*, Special Edition on Climate Change, 30 June 2014, <http://sitn.hms.harvard.edu/flash/2014/pausing-to-talk-about-climate-change>.

SELECTED WORKSHOPS AND SHORT COURSES

UCAR/NCAR Equity and Inclusion (UNEION) 201 Training Series <i>[held virtually due to COVID-19]</i>	2020
SciPy 2020: Conference on Scientific Computing with Python <i>[held virtually due to COVID-19]</i>	2020
ClimateNet AR/TC Labeling Campaign for Machine Learning (co-organizer) National Center for Atmospheric Research, Boulder, CO	2019
Earth Science Women’s Network Leadership Workshop National Center for Atmospheric Research and University of Colorado, Boulder, CO	2019
CMIP6 Hackathon National Center for Atmospheric Research, Boulder, CO	2019
CGD-CISL Python Tutorial and Hackathon National Center for Atmospheric Research, Boulder, CO	2019
Rising Voices 7 Workshop: Building Relationships and Practices for Intercultural Science National Center for Atmospheric Research, Boulder, CO	2019
The Community WRF-Hydro Modeling System Training Workshop National Center for Atmospheric Research, Boulder, CO	2018
UCAR/NCAR Equity and Inclusion (UNEION) 101 Training Series National Center for Atmospheric Research, Boulder, CO	2018
Earth Educators’ Rendezvous Preparing for an Academic Career Workshop University of Kansas, Lawrence, KS	2018
The Functionally Assembled Terrestrial Ecosystem Simulator (FATES) Tutorial National Center for Atmospheric Research, Boulder, CO	2018
Low Environmental Impact Solar Radiation Management Experiments Workshop Institute for Advanced Sustainability Studies, Potsdam, Germany	2016
Active Learning in the Sciences Teaching Seminar Derek Bok Center for Teaching and Learning, Cambridge, MA	2015
Community Land Model (CLM) Tutorial National Center for Atmospheric Research, Boulder, CO	2014
ComSciCon-local Communicating Science Workshop Harvard University, Cambridge, MA	2014
Shaping Policy with Science, Graduate Student Council Short Course Harvard University, Cambridge, MA	2014
Fourth Interdisciplinary Summer School on Geoengineering Harvard University, Cambridge, MA	2013
Global Climate Coalition at UNFCCC COP15 University of Copenhagen, Copenhagen, Denmark	2009

PROFESSIONAL AFFILIATIONS

American Geophysical Union, American Physical Society, Earth Science Women's Network

TECHNICAL SKILLS

Languages: Bash, C, Fortran, HTML, LaTeX, Objective C/C++

Modeling Tools: NetCDF, HDF4/5, HPC, Machine Learning, Open MPI, NCAR CESM/CLM

Development Tools: Git/GitHub, Subversion, Jupyter Notebooks

Scientific Visualization & Analysis: Python, NCL/NCO, R, Matlab, Keras, TensorFlow