Katherine (Katie) Dagon

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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

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 (2021), ClimateNet: an expert-labelled open dataset and Deep Learning architecture for enabling high-precision analyses of extreme weather. *Geoscientific Model Development*, 14, 107-124, https://doi.org/10.5194/gmd-14-107-2021.

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.

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 SO_2 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.

NON PEER-REVIEWED PUBLICATIONS

Dagon, K., M. Molina, *et al.* (2021), Machine learning to extend and understand the sources and limits of water cycle predictability on subseasonal-to-decadal timescales in the Earth system. DOE EESSD White Paper on AI4ESP, https://doi.org/10.2172/1769744.

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

Lewis University	*virtual*
Department of Physics Weisenthal Colloquium Series	February 2021
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.__, Machine Learning-Based Feature Detection to Associate Precipitation Extremes with Synoptic Weather Events. *2nd Workshop on Knowledge Guided Machine Learning*, virtual, oral presentation, August 2021.

*__Dagon, K.__, Overview of CESM-Related Machine Learning Projects at NCAR. *CESM Machine Learning Working Group Meeting*, virtual, oral presentation, June 2021.

__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," *AER Space Weather Science meeting,* virtual, March 2021.

"Research on Climate Science and Climate Modeling," *Oglala Lakota Tribal College groundwater course*, virtual, April 2020.

"Research on Geoengineering, or Climate Intervention Strategies," *Watershed High School climate change course*, virtual, March 2020.

"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, Community Earth System Model Tutorial	2021
Guest Lecturer, CU Boulder Masters of the Environment Program	2021
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 Initiative co-lead	2020 -
Co-Chair, Gordon Research Seminar on Climate Engineering	2019 -
(originally 2020, postponed to 2022 due to COVID-19)	
CESM Workshop Machine Learning Cross Working Group Organizer	2021
NCAR Climate and Global Dynamics Seminar Series Coordinator	2020-2021
Physics of Climate Executive Committee, American Physical Society	2019-2021
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
Summer School on Geoengineering Organizing Committee, Harvard University	2013
Harvard Graduate Consortium on Energy and Environment	2012-2015

Journal Reviewer: Atmospheric Chemistry and Physics, Earth's Future, Geophysical Research Letters, Geoscientific Model Development, Journal of Hydrometeorology

MENTORING

NCAR SOARS Internship Program Writing Mentor	2021
Kingston High School Science Research Mentor	2020-2021
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

APS Congressional Visits Day (virtual)	2021
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

Trustworthy Artificial Intelligence for Environmental Science (TAI4ES) Summer School *[held virtually due to COVID-19]*	2021
UCAR/NCAR Equity and Inclusion (UNEION) 201 Training Series *[held virtually due to COVID-19]*	2020-2021
SciPy 2020: Conference on Scientific Computing with Python *[held virtually due to COVID-19]*	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	2018

National Center for Atmospheric Research, Boulder, CO

Low Environmental Impact Solar Radiation Management Experiments Workshop   2016
Institute for Advanced Sustainability Studies, Potsdam, Germany

Active Learning in the Sciences Teaching Seminar   2015
Derek Bok Center for Teaching and Learning, Cambridge, MA

Community Land Model (CLM) Tutorial   2014
National Center for Atmospheric Research, Boulder, CO

ComSciCon-local Communicating Science Workshop   2014
Harvard University, Cambridge, MA

Shaping Policy with Science, Graduate Student Council Short Course   2014
Harvard University, Cambridge, MA

Fourth Interdisciplinary Summer School on Geoengineering   2013
Harvard University, Cambridge, MA

Global Climate Coalition at UNFCCC COP15   2009
University of Copenhagen, Copenhagen, Denmark

PROFESSIONAL AFFILIATIONS

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

TECHNICAL SKILLS

Languages: Bash, Fortran, HTML, LaTeX
Modeling Tools: NetCDF, HDF4/5, HPC, Machine Learning, Open MPI, NCAR CESM/CLM
Development Tools: Git/GitHub, Jupyter Notebooks
Scientific Visualization & Analysis: Python, NCL/NCO, R, Matlab, Keras, TensorFlow