Katherine (Katie) Dagon

National Center for Atmospheric Research
P.O. Box 3000, Boulder, CO 80307
kdagon@ucar.edu ◆ https://katiedagon.github.io

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.J. 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.

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., 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.

"Machine Learning for Climate Science," *Weiqing Han group meeting*, virtual, October 2020.

"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, 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 -
NCAR Climate and Global Dynamics Seminar Series Coordinator — 2020 -
Co-Chair, Gordon Research Seminar on Climate Engineering — 2019 -
(originally 2020, postponed to 2022 due to COVID-19)
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
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, 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

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

UCAR/NCAR Equity and Inclusion (UNEION) 201 Training Series 2020-2021
[held virtually due to COVID-19]

SciPy 2020: Conference on Scientific Computing with Python 2020
[held virtually due to COVID-19]

ClimateNet AR/TC Labeling Campaign for Machine Learning (co-organizer) 2019
National Center for Atmospheric Research, Boulder, CO

Earth Science Women's Network Leadership Workshop 2019
National Center for Atmospheric Research and University of Colorado, Boulder, CO

CMIP6 Hackathon 2019
National Center for Atmospheric Research, Boulder, CO

CGD-CISL Python Tutorial and Hackathon 2019
National Center for Atmospheric Research, Boulder, CO

Rising Voices 7 Workshop: Building Relationships and Practices for Intercultural Science 2019
National Center for Atmospheric Research, Boulder, CO

The Community WRF-Hydro Modeling System Training Workshop 2018
National Center for Atmospheric Research, Boulder, CO

UCAR/NCAR Equity and Inclusion (UNEION) 101 Training Series 2018
National Center for Atmospheric Research, Boulder, CO

Earth Educators' Rendezvous Preparing for an Academic Career Workshop 2018
University of Kansas, Lawrence, KS

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