Katherine (Katie) Dagon (she/her)
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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

AWARDS & FELLOWSHIPS

NCAR Accelerated Scientific Discovery Computation Award (Lead: M.J. Molina)   2022-2023
Radiant Earth Foundation Leading Women in ML4EO   2022
NCAR CISL Special Recognition Award for AI4ESS   2020
Andrew Slater Award, NCAR Land Model Working Group Meeting   2019
Earth Educators' Rendezvous Travel Grant   2018
NCAR Advanced Study Program Postdoctoral Fellowship   2017-2019
Presidential Management Fellowship Finalist   2017
NCAR CESM Workshop Travel Grant   2016
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
Joseph J. Loferski Award, Brown University Engineering   2010
Brown University Undergraduate Research and Teaching Award   2009

SUBMITTED PUBLICATIONS

Dagon, K., J. Truesdale, J.C. Biard, K.E. Kunkel, G.A. Meehl, and M.J. Molina (Under Review), Machine learning-based detection of weather fronts and associated extreme precipitation. *Journal of Geophysical Research: Atmospheres*, https://doi.org/10.1002/essoar.10511254.1.

Cheng, Y., A.J. Newman, K. Musselman, S. Swenson, D. Lawrence, J. Hamman, **K. Dagon**, and D. Kennedy (Under Review), Moving land models towards actionable science: A novel application of the Community Terrestrial Systems Model across Alaska and the Yukon River Basin. *Water Resources* Research, https://doi.org/10.1002/essoar.10510588.1.

Tye, M.R., **K. Dagon**, M.J. Molina, J.H. Richter, D. Visioni, B. Kravitz, C. Tebaldi, and S. Tilmes (Under Review), Indices of Extremes: Geographic patterns of change in extremes and associated vegetation impacts under climate intervention, *Earth System Dynamics*, https://doi.org/10.5194/egusphere-2022-1.

PEER-REVIEWED PUBLICATIONS

Ali, A.A., Y. Fan, M.D. Corre, M.M. Kotowska, E. Preuss-Hassler, A.N. Cahyo, F.E. Moyano, C. Stiegler, A. Röll, A. Meijide, A. Olchev, A. Ringeler, C. Leuschner, R. Ariani, T. June, S. Tarigan, H. Kreft, D. Hölscher, C. Xu, C.D. Koven, **K. Dagon**, R.A. Fisher, E. Veldkamp, and A. Knohl (2022), Implementing a New Rubber Plant Functional Type in the Community Land Model (CLM5) Improves Accuracy of Carbon and Water Flux Estimation. *Land*, 11, 183, https://doi.org/10.3390/land11020183.

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, https://doi.org/10.2172/1769744.

INVITED TALKS & SEMINARS

- DOE Rubisco SFA Biogeochemistry Science Friday Webinar, virtual, November 2021
- Lewis University, Department of Physics Weisenthal Colloquium Series, virtual, February 2021
- Lawrence Berkeley National Laboratory, NERSC Seminar, Berkeley, CA, November 2019
- Pennsylvania State University, Department of Meteorology and Atmospheric Science Colloquium, State College, PA, February 2019
- American University, Department of Environmental Science, Washington, DC, February 2019
- Indiana University, Department of Earth and Atmospheric Sciences Colloquium, Bloomington, IN, January 2019
- Pennsylvania State University, Department of Geography Seminar, State College, PA, January 2019
- University of Washington, Department of Atmospheric Sciences Seminar, Seattle, WA, July 2018

SELECTED CONFERENCE & WORKSHOP PRESENTATIONS (*invited)

NCAR Earth System Data Science, *NASEM Machine Learning and Artificial Intelligence to Advance Earth System Science Workshop*, virtual, February 2022 (*talk & panel), https://doi.org/10.5281/zenodo.6048010.

Machine Learning-Based Feature Detection to Associate Precipitation Extremes with Synoptic Weather Events, *American Geophysical Union Fall Meeting*, virtual, December 2021 (*talk).

Grand Challenges in AI4ESP: A Climate Modeling Perspective, *DOE Artificial Intelligence for Earth System Predictability (AI4ESP) Workshop*, virtual, November 2021 (*plenary).

Machine Learning and Earth System Modeling: From Parameter Calibration to Feature Detection, *Kavli Institute for Theoretical Physics Machine Learning for Climate Conference*, Santa Barbara, CA, November 2021 (*talk), https://doi.org/10.26081/K6334B.

Machine Learning-Based Feature Detection to Associate Precipitation Extremes with Synoptic Weather Events, *2nd Workshop on Knowledge Guided Machine Learning*, virtual, August 2021 (*talk).

Applying Machine Learning to Associate Precipitation Extremes with Synoptic-Scale Weather Events, *American Geophysical Union Fall Meeting*, virtual, December 2020 (talk).

Bayesian Calibration with Neural Network-Based Emulation of a Land Model, *American Geophysical Union Fall Meeting*, virtual, oral presentation, December 2020 (*talk).

A Machine Learning Approach to Quantify Land Model Parameter Uncertainty, *American Geophysical Union Fall Meeting*, San Francisco, CA, December 2019 (talk).

Uncertainties in the Response of Terrestrial Ecosystems to Solar Geoengineering, *1st Geoengineering Modeling Research Consortium Workshop*, Boulder, CO, May 2019 (talk).

Machine Learning for Parameter Estimation in CLM5, *CESM Land Model Working Group Meeting*, Boulder, CO, February 2019 (talk).

Reducing Uncertainty in Land Surface Models, *American Geophysical Union Fall Meeting*, Washington, DC, December 2018 (talk).

Moving Towards a Global Biogeophysical Parameter Optimization for CLM5, *Community Earth System Model Workshop*, Boulder, CO, June 2018 (talk).

Effects of Solar Geoengineering on Vegetation: Implications for Biodiversity and Conservation, *American Geophysical Union Fall Meeting*, New Orleans, LA, December 2017 (talk).

Regional Climate Variability under Model Simulations of Solar Geoengineering, *Gordon Research Conference on Climate Engineering*, Newry, ME, July 2017 (poster).

Soil Moisture-Climate Coupling under Model Simulations of Solar Geoengineering, *Community Earth System Model Workshop,* Breckenridge, CO, June 2016 (talk).

Exploring the Effects of Solar Radiation Management on Water Cycling in a Coupled Land-Atmosphere Model, *Graduate Climate Conference*, Woods Hole, MA, November 2015 (talk).

TEACHING

Tutorials and Workshops
- Community Earth System Model Tutorial, virtual, August 2021
- AGU Tutorial on Machine Learning and Deep Learning, virtual, December 2020
- Artificial Intelligence for Earth System Science (AI4ESS) Summer School, virtual, June 2020
- Community Terrestrial Systems Model Tutorial, Boulder, CO, February 2019

Guest Lectures
- Masters of the Environment Program (graduate), University of Colorado Boulder, virtual, May 2021
- Climate Science and Modeling (undergraduate), Oglala Lakota Tribal College, virtual, April 2020

Teaching Assistantships
- The Consequences of Energy Systems (graduate), Department of Earth and Planetary Sciences, Harvard University, Fall 2015 and 2016
- The Climate-Energy Challenge (undergraduate), Department of Earth and Planetary Sciences, Harvard University, Fall 2014, 2015, and 2016
- The Fluid Earth (undergraduate), Department of Earth and Planetary Sciences, Harvard University, Spring 2013
- Introductory Calculus (undergraduate), Department of Mathematics, Brown University, Fall 2009

MENTORING

Students
- John Landy, PhD, Stony Brook University, Dissertation Committee Member, 2022 -
- Tariq Walker, Undergraduate, Kennesaw State University, UCAR SOARS Writing Mentor, Summer 2021
- Gavin Blair, Kingston High School, Science Research Mentor, 2020-2021
- Lilly Jones, PhD, South Dakota School of Mines & Technology, UCAR Next Generation Fellowship Research Mentor, 2019-2020
- William Meyers, Carmel High School, Science Research Mentor, 2019
- Sung Min Kim, Undergraduate, Cornell University, UCAR SOARS Community Mentor, Summer 2018
- Catarina Do, Undergraduate, Harvard College, WISTEM Mentor, 2016-2017
- Victoria Garito, Briarcliff High School, Intel Science Research Program Mentor, 2014-2015

Mentoring Programs
- Harvard Earth and Planetary Sciences Graduate Peer Mentoring, 2011-2015
- Harvard Graduate Women in Science and Engineering Mentoring Program, 2011-2013
- Brown University Women's Launch Pad Mentoring Program, 2009-2010

ACADEMIC SERVICE & LEADERSHIP
- Co-Chair, Gordon Research Seminar on Climate Engineering, 2022
- Co-Lead, NCAR Earth System Data Science (ESDS) Initiative, 2020 -
- Session Convener, Improving Earth System Predictability: New Mechanisms, Feedbacks, and Approaches for Predicting Global Biogeochemical Cycles in Earth System Models, AGU Fall Meeting, 2021
- Session Co-Lead, Climate Variability and Extremes, DOE AI4ESP Workshop, 2021
- Session Organizer, Machine Learning Cross Working Group, CESM Workshop, 2021
- Panelist, ASP Postdocs Writing a Research Statement Workshop, 2021
- Coordinator, NCAR Climate and Global Dynamics Seminar Series, 2020-2021
- Panelist, ASP Discussion on Transition from Postdocs to Project Scientists, 2020
- Executive Committee, Topical Group on Physics of Climate, American Physical Society, 2019-2021
- Co-Organizer, ClimateNet Labeling Campaign for Machine Learning, 2019
- Speaker, Undergraduate Leadership Workshop, National Center for Atmospheric Research, 2019

- Postdoctoral Fellows Networking Committee, National Center for Atmospheric Research, 2017-2019
- Program Committee, Topical Group on Physics of Climate, American Physical Society, 2017-2018
- Organizer, Plants and Climate Seminar Series, Harvard University, 2015-2016
- Organizing Committee, Fourth Interdisciplinary Summer School on Geoengineering, Harvard University, 2013
- *Journal Reviewer:* Atmospheric Chemistry and Physics, Earth's Future, Environmental Data Science, Geophysical Research Letters, Geoscientific Model Development, Journal of Advances in Modeling Earth Systems, Journal of Hydrometeorology
- *Proposal Reviewer:* NSF Climate and Large-Scale Dynamics Program

PUBLIC ENGAGEMENT

- CU Boulder Investigate Careers in the Environment talk, Boulder, CO, 2022
- Farmington High School Capstone Project Expert Scientist, virtual, 2021
- American Physical Society Congressional Visits Day, virtual, 2021
- Watershed High School Guest Scientist, virtual, 2020
- WOW Children's Museum Girls in Science Night, Lafayette, CO, 2020
- NCAR Traveling Climate Exhibit Scientific Team, Boulder, CO, 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 Graduate Student Science Policy 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

Sparse arrays and the CESM land model component [with D. Cherian], *NCAR ESDS Blog*, 24 February 2022, https://ncar.github.io/esds/posts/2022/sparse-PFT-gridding.

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.

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.

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.

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.

MEDIA

"Understanding the Dynamic Climate System," Interviewee, *APS News*, May 2020, https://www.aps.org/publications/apsnews/202005/climate.cfm.

"Space Mirrors and Other Weird Ways to Fight Climate Change," Scientific Consultant, *ACS Reactions and PBS Digital Studios*, 25 September 2019, https://www.youtube.com/watch?v=9agoVDFJs8A.

"Ice Drove Past Indo-Pacific Climate Variance," Interviewee, *AGU EOS*, 2 April 2019, https://doi.org/10.1029/2019EO119709.

"A Disappointing New Problem With Geo-Engineering," Interviewee, *The Atlantic*, 8 August 2018, https://www.theatlantic.com/science/archive/2018/08/solar-geo-engineering-cant-save-the-worlds-crops/567017.

"Cow Burps are Warming the Planet," Scientific Consultant, *ACS Reactions and PBS Digital Studios*, 20 March 2018, https://www.youtube.com/watch?v=MnRFUSGz_ZM.

"Big Solutions for Big Problems," Interviewee, *Building a Greener Idaho Radio Show*, 31 August 2017, https://bgidaho.wordpress.com/2017/08/31/big-solutions-for-big-problems.

PROFESSIONAL DEVELOPMENT

- Diversity, Equity, Inclusion & Belonging (DEI&B) Foundational Training: Unconscious Bias Awareness + Psychological Safety, Strata RMK, virtual, 2022
- UCAR/NCAR Equity and Inclusion (UNEION) 201 Training Series, virtual, 2020-2021
- Earth Science Women's Network Leadership Workshop, Boulder, CO, 2019
- CMIP6 Hackathon, NCAR, Boulder, CO, 2019
- Rising Voices 7 Workshop: Building relationships and practices for intercultural science, NCAR, Boulder, CO, 2019
- The Community WRF-Hydro Modeling System Training Workshop, NCAR, Boulder, CO, 2018
- UCAR/NCAR Equity and Inclusion (UNEION) 101 Training Series, 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, NCAR, 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, NCAR, 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
- Harvard Graduate Consortium on Energy and Environment, Cambridge, MA, 2012-2015
- 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, 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