Abhishekh Kumar Srivastava Curriculum Vitae

Contact Information

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Research Profile

I am an Assistant Project Scientist at the University of California, Davis, with more than five years of research experience. I am a Co-Investigator in a United States Department of Energy (DOE) funded (project budget: $9 million, term: 09/01/2022-08/31/2025) multi-institutional (involving 7 US universities, 2 national laboratories, and the National Center for Atmospheric Research) hydroclimate data assessment project (A Framework for Improving Analysis and Modeling of Earth System and Intersectoral Dynamics at Regional Scales). In this project, I have been working on a broad range of research areas pertaining to precipitation extremes. Specifically, I have been working on connecting large-scale meteorological processes to local precipitation extremes, detection and attribution of natural and human influences on precipitation extremes, quantifying future changes in precipitation intensity-duration-frequency (IDF) curves, exploring methods to reduce uncertainty in future projections of extremes, and the innovative use of metrics for effective climate model evaluation. My research is decision-relevant and actionable, as it provides decision-support to stakeholders (e.g., civil planners, and water managers) for effective planning and action in the face of climate change. I have also been working on another DOE project entitled "CAlibrated and Systematic Characterization, Attribution, and Detection of Extremes (CASCADE) SFA" ($25 million; 10/2013- 09/2023) at Lawrence Berkeley National Laboratory. In this project, my main area of focus is the detection and attribution of weather and climate extremes, particularly low-likelihood, high-impact events.

Research Expertise

Statistics of weather and climate extremes, detection and attribution, precipitation extremes, decadal variability and predictability, atmosphere-land-ocean-sea ice interaction, midlatitude dynamics, tropical-extratropical interaction, arctic-midlatitude interaction, aquaplanet simulations, climate change, metric development, climate model evaluation, co-production of actionable climate science.

Statistical and Technical Expertise

Advanced multivariate statistical methods (discriminant analysis, average predictability time analysis, generalized regression models), extreme value statistics, machine learning, testing hypotheses, clustering analysis,

geostatistics, climate modeling, stochastic modeling, R, GrADS, CDO, NCO, Python, MATLAB, shell scripting, NCL, Fortran.

Education

- Ph.D., Climate Dynamics, George Mason University, Fairfax, VA, USA. 2010-2017.
- M.Sc., Solid State Physics, University of Allahabad, UP, India. 1997-1999.
- B.Sc., Physics, Chemistry, Mathematics, University of Allahabad, UP, India. 1994-1997.

Research Experience

- Assistant Project Scientist, University of California; Davis, CA, USA. Oct 2021–present.
- Postdoctoral Scholar, University of California; Davis, CA, USA. Oct 2017–Sep2021.
- Intern (Postdoctoral), George Mason University, Fairfax, VA, USA. July 2017– Sep 2017.
- Graduate Research Assistant, George Mason University, Fairfax, VA, USA. 2010-2017.

Recent Journal Publications

11. Jagannathan, K., Buddhavarapu, S., Ullrich, P., Jones, A.D., HyperFACETS project team (**Abhishekh Srivastava**) (2022). Typologies of Actionable Climate Information and its Use. Under review in Global Environmental Change.

10. **Srivastava, A. K.**, Ullrich, P. A., Rastogi, D., Vahmani, P., Jones, A., and Grotjahn, R.: Assessment of WRF (v 4.2.1) dynamically downscaled precipitation on subdaily and daily timescales over CONUS, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2022-1382.

9. Reed, K.A., Goldenson, N., Grotjahn, R., Gutowski, W.J., Jagannathan, K., Jones, A.D., Leung, L.R., McGinnis, S.A., Pryor, S.C., **Srivastava, A.K.** and Ullrich, P.A. (2022). Metrics as tools for bridging climate science and applications. Wiley Interdisciplinary Reviews: Climate Change, p.e799. https://doi.org/10.1002/wcc.799.

8. **Srivastava, A. K.**, Grotjahn, R., Ullrich, P. A., & Zarzycki, C. (2022). Evaluation of precipitation indices in suites of dynamically and statistically downscaled regional climate models over Florida. Clim Dyn 58, 1587–1611 (2022). https://doi.org/10.1007/s00382-021-05980-w.

7. **Srivastava, A. K.**, Grotjahn, R., Ullrich, P. A., & Sadegh, M. (2021). Pooling Data Improves Multimodel IDF Estimates over Median-Based IDF Estimates: Analysis over the Susquehanna and Florida, Journal of

Hydrometeorology, 22(4), 971-995. https://doi.org/10.1175/JHM-D-20-0180.1.

6. Rhoades, A. M., Jones, A. D., **Srivastava, A.**, Huang, H., O'Brien, T. A., Patricola, C. M., Ullrich, P.A., Wehner, M., Zhou, Y. (2020). The Shifting Scales of Western US Landfalling Atmospheric Rivers Under Climate Change. Geophysical Research Letters, 47(17), e2020GL089096. https://doi.org/10.1029/2020GL089096.

5. **Srivastava, A.**, Grotjahn, R., & Ullrich, P. A. (2020). Evaluation of historical CMIP6 model simulations of extreme precipitation over contiguous US regions. Weather and Climate Extremes, 29, 100268. https://doi.org/10.1016/j.wace.2020.100268.

4. **Srivastava, A.**, Grotjahn, R., Ullrich, P. A., & Risser, M. (2019). A unified approach to evaluating precipitation frequency estimates with uncertainty quantification: Application to Florida and California watersheds. Journal of Hydrology, 578, 124095. https://doi.org/10.1016/j.jhydrol.2019.124095.

3. Manogaran, G., Shakeel, P. M., Priyan R, V., Chilamkurti, N., & **Srivastava, A**. (2019). Ant colony optimization-induced route optimization for enhancing driving range of electric vehicles. International Journal of Communication Systems, e3964. https://doi.org/10.1002/dac.3964.

2. **Srivastava, A.**, & DelSole, T. (2017). Decadal predictability without ocean dynamics. Proceedings of the National Academy of Sciences, 114(9), 2177-2182. https://doi.org/10.1073/pnas.1614085114.

1. **Srivastava, A. K.**, & DelSole, T. (2014). Robust forced response in South Asian summer monsoon in a future climate. Journal of Climate, 27(20), 7849-7860. https://doi.org/10.1175/JCLI-D-13-00599.1.

Grant/ Project

- US-DOE project "A Framework for Improving Analysis and Modeling of Earth System and Intersectoral Dynamics at Regional Scales". Institution: University of California, Davis. Period: 09/01/2022-08/31/2025. DOE Award Number: DE-SC0016605. Amount: $9 million.
- US-DOE project "CAlibrated and Systematic Characterization, Attribution, and Detection of Extremes (CASCADE) SFA". Institution: Lawrence Berkeley National Laboratory. DOE Award Number: ESD13052. Period: 10/2013-09/2023. Amount: $25 million.

Editorial Services

- Atmosphere (MDPI)- Topic Editor. 2020 – present
- Climate (MDPI)- Special Issue Editor "Extreme Precipitation in a Changing Climate".

Organizer/ Convener/ Chair

9. (JM04) Weather and Climate Extremes: Understanding, Modeling, Prediction, and Impacts, 28^{th} International Union of Geodesy and Geophysics General Assembly, 2023, Berlin, Germany (Co-Convener).
8. Decision-relevant understanding of dry and wet precipitation extremes and their impacts, American Geophysical Union Fall Meeting 2022, Chicago, IL, USA (Primary Convener, Chair, Liaison).
7. Decision-relevant understanding of dry and wet precipitation extremes and their impacts, 19^{th} Asian Oceania Geosciences Society Meeting, 2022, Virtual (Primary Convener).
6. 7th Annual UC Davis Postdoctoral Research Symposium, March 2022, University of California, Davis, CA, USA (Organizer).
5. Decision-relevant understanding of precipitation extremes and their impacts, American Geophysical Union Fall Meeting 2021, New Orleans, LA, USA (Primary Convener, Chair, Liaison).
4. 6th Annual UC Davis Postdoctoral Research Symposium, March 2021, University of California, Davis, CA, USA (Organizer).
3. Hydrometeorologic and Coastal Extremes in Current and Future Climates, 27^{th} International Union of Geodesy and Geophysics General Assembly, 2019, Montreal, Canada (Convener).
2. High-Impact Weather and Climate Extremes, 27^{th} International Union of Geodesy and Geophysics General Assembly, 2019, Montreal, Canada (Convener).
1. 5th Annual UC Davis Postdoctoral Research Symposium, April 2019, University of California, Davis, CA, USA (Organizer).

Peer Review So far, I have reviewed 70 manuscripts submitted to the following journals:

20. Nature Communications (Nature). Impact Factor:17.69.
19. Climate Dynamics (Springer). Impact Factor:4.90.
18. Journal of Hydrometeorology (American Meteorological Society). Impact Factor: 4.87
17. Earth and Space Science (American Geophysical Union). Impact Factor: 3.68
16. Natural Hazards and Earth System Sciences (European Geophysical Union). Impact Factor: 4.58
15. Atmosphere (MDPI). Impact Factor: 3.11
14. Geoscientific Model Development (European Geophysical Union). Impact Factor: 6.89

13. International Journal of Climatology (Royal Meteorological Society). Impact Factor: 3.65
12. Journal of Hydrology (Elsevier). Impact Factor: 6.70
11. Weather and Forecasting (American Meteorological Society). Impact Factor: 3.37
10. Journal of Applied Meteorology and Climatology (American Meteorological Society). Impact Factor: 3.55
9. Natural Hazards (Springer). Impact Factor: 3.15
8. Scientific Data (Nature). Impact Factor: 8.50
7. Climate (MDPI). Cite Score: 4.7
6. Water (MDPI). Impact Factor: 3.53
5. Geophysical Research Letters (American Geophysical Union). Impact Factor: 5.58
4. Journal of Climate (American Meteorological Society). Impact Factor: 5.38
3. Climatic Change (Springer). Impact Factor: 5.17
2. Advances in Statistical Climatology, Meteorology and Oceanography (Copernicus).
1. Sustainability (MDPI). Impact Factor: 3.89

Judging activities

I have judged the abstracts and scientific presentations (oral and poster) in the following meetings/ conferences.

- Decision-relevant understanding of dry and wet precipitation extremes and their impacts, American Geophysical Union Fall Meeting 2022, Chicago, IL, USA.
- American Geophysical Union's Fall Meeting Outstanding Student Poster Award (OSPA) for the years 2018, 2019, 2020, 2021, and 2022.
- Decision-relevant understanding of dry and wet precipitation extremes and their impacts, 19^{th} Asian Oceania Geosciences Society Meeting, 2022, Virtual.
- 7th Annual UC Davis Postdoctoral Research Symposium, March 2022, University of California, Davis, CA, USA.
- "Decision-relevant understanding of precipitation extremes and their impacts" session, American Geophysical Union Fall Meeting 2021, New Orleans, LA, USA.
- Hydrometeorologic and Coastal Extremes in Current and Future Climates, 27^{th} International Union of Geodesy and Geophysics General Assembly, 2019, Montreal, Canada.
- High-Impact Weather and Climate Extremes, 27^{th} International Union of Geodesy and Geophysics General Assembly, 2019, Montreal, Canada.
- 6th Annual UC Davis Postdoctoral Research Symposium, March 2021, University of California, Davis, CA, USA.

- 5th Annual UC Davis Postdoctoral Research Symposium, April 2019, University of California, Davis, CA, USA.

Talk/
Presentation

15. Evaluation of Precipitation Indices in Suites of Dynamically and Statistically Downscaled Regional Climate Models over Florida. American Geophysical Union Fall Meeting 2022, Chicago, IL, USA.

14. Pooling data improves multimodel IDF estimates over median-based IDF estimates: Analysis over Susquehanna and Florida. American Geophysical Union Fall Meeting 2021, New Orleans, USA.

13. Large Scale Meteorological Patterns Associated with Extreme Precipitation Events Over Northern California. American Geophysical Union Fall Meeting 2021, New Orleans, LA, USA.

12. From storylines to anthologies – Systematically examining the implications of climate change on known weather extremes and their multisectoral impacts (**Invited**, coauthor). American Geophysical Union Fall Meeting 2021, New Orleans, LA, USA.

11. Evaluation of historical CMIP6 model simulations of extreme precipitation over contiguous US regions. American Geophysical Union Fall Meeting 2020, Virtual.

10. The Shifting Scales of Western US Landfalling Atmospheric Rivers Under Climate Change. American Geophysical Union Fall Meeting 2020, Virtual.

9. A Multimodel Technique for Estimating Future Changes in Extreme Precipitation, American Geophysical Union Fall Meeting 2019, San Francisco, CA, USA.

8. Analysis of extreme precipitation over Florida in regional climate model simulations, International Union of Geodesy and Geophysics General Assembly 2019, Montreal, Canada.

7. Decision-relevant metrics for regional hydroclimate phenomena (**Invited**, coauthor), American Geophysical Union Fall Meeting 2018, Washington DC, USA.

6. Assessment of Observational Uncertainties and Model Performance in Mean and Extreme Precipitation Characteristics, American Geophysical Union Fall Meeting 2018, Washington DC, USA.

5. Assessment of observational uncertainties and model performances in precipitation metrics in selected watershed regions of the US, Asia Oceania Geosciences Society (AOGS) meeting 2018, Hawaii, USA.

4. Decadal Predictability without Ocean Dynamics, American Geophysical Union Fall Meeting 2016, San Francisco, CA, USA.

3. Decadal Predictability without Ocean Dynamics, Dynamical Core Model Intercomparison Project (DCMIP) workshop, June 2016, National Center for Atmospheric Research (NCAR), Boulder, Colorado, USA.

2. Can we forecast the next couple of years w/o Ocean circulation?, GMU Earth Week's Lightning Talks, April 20, 2016, George Mason University, Fairfax, VA, USA.

1. Monsoon in a Changing Climate, Targeted Training Activity: ENSO Monsoon in the Current and Future Climate, August 2012, The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy.

Workshop

12. Crash Course in Supercomputing, Lawrence Berkeley National Laboratory, virtual, June 11, 2021.

11. Machine Learning and Deep Learning for Environmental and Geosciences, virtual, American Geophysical Union Fall Meeting 2020.

10. NOAA/CPO/ESSM - DOE/ESSD Precipitation Processes and Predictability Workshop, virtual, Nov 30-Dec 2, 2020.

9. Multivariate Modeling in Hydrology, Climatology, and Geosciences: Copulas, Multihazard Analysis, and Probabilistic Prediction, American Geophysical Union Fall Meeting 2018, Washington DC, USA.

8. Climate & Weather Extremes Tutorial 2018, National Center for Atmospheric Research (NCAR), Boulder, USA.

7. Model Hierarchies Workshop, Princeton University, November 2016, New Jersey, USA.

6. Dynamical Core Model Intercomparison Project (DCMIP) workshop, June 2016, National Center for Atmospheric Research (NCAR), Boulder, Colorado, USA.

5. Shukla Symposium on Predictability in the Midst of Chaos, April 2015, Rockville, Maryland, USA.

4. Workshop on the Nature of MJO, June 2013, George Mason University, Fairfax, VA, USA.

3. Targeted Training Activity: ENSO Monsoon in the Current and Future Climate, July 2012, ICTP, Trieste, Italy.

2. NCEP CFSv2 Evaluation Workshop, April 2012, College Park, Maryland, USA.

1. Targeted Training Activity: Statistical Methods in Seasonal Prediction, August 2010, ICTP, Trieste, Italy.

Professional membership

American Geophysical Union, American Meteorological Society

Awards and Scholarship

Student Awards — George Mason University, Fairfax, VA, USA

- Presidential Scholarship, 2010–2012.

Travel Awards

- Dynamical Core Model Intercomparison Project (DCMIP) workshop, National Center for Atmospheric Research (NCAR), Boulder, Colorado, USA. June 5-18, 2016.
- Targeted Training Activity: ENSO Monsoon in the Current and Future Climate, The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy. July30 - August 10, 2012.
- Targeted Training Activity: Statistical Methods in Seasonal Prediction, The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy. August 2-13, 2010.

Teaching Experience

Guest Teacher, ATM 10, University of California, Davis.
Lecturer in Physics, Jan 2008 - June 2010, United College of Engineering and Research, Allahabad, U.P., India.

References

- Dr. Paul Ullrich, Professor, University of California, Davis, CA, USA; email: paullrich@ucdavis.edu; phone: 530-400-9817.
- Dr. Timothy DelSole, Professor, Department of Atmospheric, Oceanic, and Earth Science, George Mason University, Fairfax, VA, USA; email: tdelsole@gmu.edu, phone: 703-993-5715.