

DEEKSHA RASTOGI

Email- rastogid@ornl.gov

EDUCATION

Aug' 2016 – Dec' 2019	PhD, Energy Science and Engineering Focus: Environmental and Climate Sciences The University of Tennessee, Knoxville, TN
Aug' 2010 – Dec' 2012	M.S., Atmospheric Sciences University of Illinois Urbana-Champaign, Urbana, IL
Aug' 2006 – Jun' 2010	B. Tech., Environmental Engineering Indian School of Mines, Dhanbad, India

WORK EXPERIENCE

Dec' 2019 – Present	Research Scientist, Computational Urban Climate, Computational Urban Science Group Computational Science and Engineering Division Oak Ridge National Laboratory, Oak Ridge TN
Aug' 2016 – Dec' 2019	Graduate Research Assistant, The University of Tennessee, Knoxville, TN - Oak Ridge National Laboratory, Oak Ridge, TN
Thesis Title:	<i>Assessment of Hydroclimate Responses to Anthropogenic Forcing and Implications for Human Systems</i>
Jun' 2019 – Aug' 2019	Graduate Visitor, Advanced Study Program Climate & Global Dynamics/Research Applications, Laboratory, National Center for Atmospheric Research Boulder, CO
Jan' 2013 – Jun' 2016 May 2012 – Aug' 2012	Post Master's Research Associate, Summer Intern, Oak Ridge Associated Universities/Oak Ridge National Laboratory, Oak Ridge, TN
Research Focus:	<i>Regional climate modeling, numerical weather modeling, climate and weather extremes, South Asian monsoon dynamics</i>
Aug' 2010 – Dec' 2012	Graduate Research Assistant, University of Illinois Urbana-Champaign, Urbana, IL
Thesis Title:	A numerical study of cropland-atmosphere feedbacks by incorporating a crop growth module in the WRF model.

Critical Expertise

Ten years of experience working in the fields of atmospheric and climate sciences with unique expertise in the understanding of hydroclimate, weather/climate extremes, and infrastructure and human responses to the atmospheric processes by developing and using numerical modeling frameworks and connecting interdisciplinary datasets.

Technical Skills

Numerical weather/climate modeling (WRF, RegCM), high performance computing, statistical data analysis, handling large datasets, Python, shell scripting, Fortran 90, SQL, NCO, NCAR command language (NCL),

LIST OF PUBLICATIONS

In Print/Press [14] ([Google Scholar Profile](#)) (cited > 350 times)

- **Rastogi, D.**, Lehner, F., & Ashfaq, M. Revisiting Recent United States Heatwaves in a Warmer and More Humid Climate (2020). *Geophysical Research Letters*, 47, e2019GL086736, <https://doi.org/10.1029/2019GL086736>
- **Rastogi, D.**, J.S. Holladay, K. J. Evans, K., B.L. Preston, and M. Ashfaq (2019), Future Changes in U.S. Residential Energy Consumption Driven by More Summer like Conditions. *Environmental Research Letters*, 14(7), doi: 10.1088/1748-9326/ab22d2.
- **Rastogi, D.**, M. Ashfaq, L. R. Leung, S. Ghosh, A. Saha, K. Hodges, and K. J. Evans (2018), Characteristics of Bay of Bengal Monsoon Depressions in the 21st Century. *Geophysical Research Letters*, 45(13), 6637-6645, doi:10.1029/2018GL078756.
- **Rastogi, D.**, S.-C. Kao, M. Ashfaq, R. Mei, E.D. Kabela, S. Gangrade, B. S. Naz, B. L. Preston, N. Singh, and V.G. Anantharaj (2017), Effects of climate change on probable maximum precipitation: A sensitivity study over the Alabama-Coosa-Tallapoosa River Basin. *Journal of Geophysical Research: Atmospheres*, 122(9), 4808-4828, doi: /10.1002/2016JD026001.
- Gangrade, S., S.-C. Kao, B.S. Naz., **D. Rastogi**, M. Ashfaq, N. Singh, and B.L. Preston (2018), Sensitivity of probable maximum flood in a changing environment, *Water Resources Research*, 54(6), 3913-3936, doi:10.1029/2017WR021987.
- Naz, B. S., S.-C. Kao, M. Ashfaq., H. Gao, **D. Rastogi**, and S. Gangrade (2018), Effects of climate change on streamflow extremes and implications for reservoir inflow in the United States, *Journal of Hydrology*, 556, 359-370, doi: 10.1016/j.jhydrol.2017.11.027.
- Paull, S. H., D. E. Horton, M. Ashfaq, **D. Rastogi**, L. D. Kramer, N. S. Diffenbaugh, and A. M. Kilpatrick (2017), Drought and immunity determine the intensity of West Nile virus epidemics and climate change impacts. *Proceedings of the Royal Society B: Biological Sciences*, 284(1848), 20162078, doi:10.1098/rspb.2016.2078.
- Ashfaq, M., **D. Rastogi**, R. Mei, D. Touma, and L. R. Leung (2017), Sources of errors in the simulation of south Asian summer monsoon in the CMIP5 GCMs. *Climate dynamics*, 49(1-2), 193-223, doi: 10.1007/s00382-016-3337-7.
- Ashfaq, M., **D. Rastogi**, R. Mei, S.-C. Kao, S. Gangrade, B.S. Naz, and D. Touma (2016), High-resolution ensemble projections of near-term regional climate over the continental United

States, *Journal of Geophysical Research: Atmospheres*, 121(17), 9943-9963, doi:10.1002/2016JD025285.

- Pagán, B. R., M. Ashfaq, **D. Rastogi**, D. R. Kendall, S.-C. Kao, B. S. Naz, R. Mei, and J.S. Pal. (2016), Extreme hydrological changes in the southwestern US drive reductions in water supply to Southern California by mid century. *Environmental Research Letters*, 11(9), 094026, doi:10.1088/1748-9326/11/9/094026.
- Naz, B. S., S.-C. Kao, M. Ashfaq, **D. Rastogi**, R. Mei, and L.C. Bowling, (2016), Regional hydrologic response to climate change in the conterminous United States using high-resolution hydroclimate simulations. *Global and Planetary Change*, 143, 100-117, doi:10.1016/j.gloplacha.2016.06.003.
- Mani, A., F. T.-C. Tsai, S.-C. Kao, B.S. Naz, M. Ashfaq, and **D. Rastogi** (2016), Conjunctive management of surface and groundwater resources under projected future climate change scenarios. *Journal of Hydrology*, 540, 397-411, doi:10.1016/j.jhydrol.2016.06.021.
- Mei, R., M. Ashfaq, **D. Rastogi**, L. R. Leung, and F. Dominguez (2015), Dominating controls for wetter South Asian summer monsoon in the twenty-first century. *Journal of Climate*, 28(8), 3400-3419, doi:10.1175/JCLI-D-14-00355.1.
- Singh, D., D. E. Horton, M. Tsiang, M. Haugen, M. Ashfaq, R. Mei, R., **D. Rastogi**, N.C. Johnson, A. Charland, B. Rajaratnam, and N.S. Diffenbaugh (2014), Severe precipitation in Northern India in June 2013: Causes, historical context, and changes in probability. *Bulletin of the American Meteorological Society*, 95(9), S58.

Submitted/to be Submitted [2]

- **Rastogi D.**, D. Touma, K. J. Evans, and M. Ashfaq (2020), Shift towards intense and widespread precipitation events over the United States by mid 21st century. *Geophysical Research Letters*, to be submitted.
- Allen-Dumas M. R., H. Xu, K.R. Kurte, and **D. Rastogi** (2020), Towards urban water security: broadening the use of machine learning methods for mitigating urban water hazards. *Frontiers in Water: Water and Hydrocomplexity*, Submitted.

Technical Reports [2]

- Kao, S.-C., M. Ashfaq, B. S. Naz, R. Martinez, **D. Rastogi**, R. Mei, J. Yetta, N. M. Samu, M. J. Sale (2016), The Second Assessment of the Effects of Climate Change on Federal Hydropower, ORNL Technical Report, Oak Ridge National Laboratory, Oak Ridge, TN, United States: N. p., 2016. Web. doi:10.2172/1340431
- Pagan, B. R., J.S. Pal, C. Gao, J. Reichenberger, D.R. Kendall, M. Ashfaq, **D. Rastogi**, S.-C. Kao, B. S. Naz, J. Schubel (2015), *Long Beach Climate Resiliency Study: Impacts on Water Supply and Demand*. United States: N. p., 2015. Web. doi:10.2172/1502614.

Encyclopedia Chapter [1]

- Roy, S. B. and **D. Rastogi** (2014), Land--Atmosphere Interactions. In *Encyclopedia of Natural Resources: Water and Air*. Taylor and Francis: New York, Published online: 21 Oct 2014; 1040-1043, doi: 10.1201/9780203757611

SELECTED CONFERENCE PRESENTATIONS

- **Rastogi D.**, D. Touma, M. Ashfaq (2019), Shift towards intense and widespread precipitation events over the United States by mid 21st century. American Geophysical Fall Meeting 2019, 9-13 December 2018, San Francisco, CA.
- **Rastogi D.**, J. S. Holladay, K. J. Evans, B. L. Preston, M. Ashfaq (2018), Shift in Seasonal Climate Patterns Likely to Impact Residential Energy Consumption in the United States. American Geophysical Fall Meeting 2018, 10-14 December 2018, Washington D.C.
- Ashfaq M., **D. Rastogi**, R. Leung, S. Ghosh, A. Saha, K. Hodges, K. Evans (2018), Characteristics of Bay of Bengal Monsoon Depressions in the 21st Century, 15th AOGS annual meeting, Jun 3-8, Honolulu, HI.
- Ashfaq M., B. Bonds, M. Alifa, **D. Rastogi**, F. Batibeniz, B. Pagan, J. Pal, K. Evans (2018), Near-Term Increase in the Hazardous Weather Conditions over North America, 15th AOGS Annual Meeting, Jun 3-8, Honolulu, HI.
- Ashfaq M., B. R. Pagan, B. W. Bonds, **D. Rastogi** (2016), Impacts of future changes in weather condition on US transportation, American Geophysical Union 2016 Fall Meeting, Dec. 12–16, San Francisco, CA.
- Gangrade, S. S.-C. Kao, **D. Rastogi**, M. Ashfaq, B. S. Naz, E. Kabela, V. G. Anantharaj, N. Singh, B. L. Preston, R. Mei (2016), Evaluation of Probable Maximum Precipitation and Flood under Climate Change in the 21st Century, American Geophysical Union 2016 Fall Meeting, Dec. 12–16, San Francisco, CA.
- S.-C. Kao, B. S. Naz, S. Gangrade, M. Ashfaq, **D. Rastogi** (2016), Sensitivity of Hydrologic Extremes to Spatial Resolution of Meteorological Forcings: A Case Study of the Conterminous United States, American Geophysical Union 2016 Fall Meeting, Dec. 12–16, San Francisco, CA.

RESEARCH PROJECTS

- Multiscale Methods for Accurate, Efficient, and Scale-Aware Models of the Earth funded by Advanced Scientific Computing Research (ASCR) program within the U.S. Department of Energy, Office of Science, Dec'2019-Present.
- Integrated Multi-Sector Multi-Scale Modeling (IM3) funded by Biological and Environmental Research program within U.S. Department of Energy, Office of Science, Dec'2019-Present.
- Energy Exascale Earth System Model (E3SM), U.S. Department of Energy, Office of Science, Office of Biological and Environmental Research, Aug' 2016 – Dec' 2019.
- Towards the Development of an Integrated Energy-Water Risk Assessment Tool for Probable Maximum Precipitation and Flood. Sponsor: Laboratory Directed Research and Development Program, Oak Ridge National Laboratory. Mar' 2014 – June' 2016.
- Effects of Climate Change on Federal Hydropower – The Second 9505 Assessment. Sponsor: Water Power Technologies Office, U.S. Department of Energy. Oct' 2013 – Jun' 2016.

- A Hierarchical Regional Modeling Framework for Decadal-Scale Hydro-climatic Predictions and Impact Assessments, funded by Laboratory Directed Research and Development (LDRD) Program, Jan' 2013 – Sep' 2013.
- Development of Frameworks for Robust Regional Climate Modeling, funded by U.S. Department of Energy Biological and Environmental Research (DOE-BER), US 1.2 Million, Jan' 2013 – Sep' 2013.

AWARDS AND RECOGNITIONS

- Invited to Urban Land Institute – [Panel on Extreme Heat in Urban Environments](#). (July 15, 2020)
- Appointed as an [Editor of Journal of Water and Climate Change](#). (starting June 2020)
- Invited to serve as guest editor for a [special issue](#) of Sustainability on “The Impact of Climate Change on Urban Water Infrastructure”. (July 2020)
- Graduate Student Researcher Award in the Science and Technology Category, UT-Battelle Awards. (2019)
- Graduate Student Fellowship, Advanced Study Program, National Center for Atmospheric Research, Boulder, CO. (2019)
- Bredesen Center Fellowship, The University of Tennessee, Knoxville, TN. (August 2016 – Present)
- Graduate Research Fellowship, Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, Urbana IL. (2010-2012)

PROFESSIONAL SERVICES & TRAININGS

- Session chair/convener:
 - American Geophysical Fall Meeting 2018, 10-14 December 2018 Washington D.C.
 - GC21A Coupled Human–Natural Systems and Global Environmental Change: Innovative Interdisciplinary Approaches I
 - GC22A Coupled Human–Natural Systems and Global Environmental Change: Innovative Interdisciplinary Approaches II
 - GC31D Coupled Human–Natural Systems and Global Environmental Change: Innovative Interdisciplinary Approaches Posters
 - American Geophysical Fall Meeting 2019, 9-13 December 2019 San Francisco, CA.
 - GC21C - Connecting Cause and Effect in Data-Driven Analyses and Vulnerability Assessments of Coupled Human and Geophysical Systems with a Special Focus on Extreme-Driven Impacts II Posters
 - GC23A - Connecting Cause and Effect in Data-Driven Analyses and Vulnerability Assessments of Coupled Human and Geophysical Systems with a Special Focus on Extreme-Driven Impacts I
- Peer Reviews (*Conducted 40 peer reviews for 14 Journals*):
 - *Journal of Geophysical Research-Atmospheres*
 - *Journal of Climate*
 - *Climate Dynamics*
 - *Journal of the American Water Resources Association*
 - *International Journal of Climatology*

- *Journal of Hydrometeorology*
- *Journal of Hydrology: Regional Studies*
- *Journal of Hydrology*
- *Journal of Water and Climate Change*
- *Climate Risk Management*
- *Climate Change*
- *Water*
- *Catena*
- *MethodsX*