Ashish Sharma

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Illinois State Water Survey
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Education

August 2012	Ph.D. in Aerospace Engineering **Arizona State University, USA** Thesis: "Climate Modeling & Downscaling for Semi-Arid Regions" | Advisor: Prof. Huei-Ping Huang Fields: regional climate modeling, climate extremes
December 2009	M.S. in Aerospace Engineering **Arizona State University, USA** Thesis: "Numerical Modeling of a Condensate Polisher Vessel of a Nuclear Reactor" | Advisor: Prof. H.J.S. Fernando Fields: computational fluid dynamics, porous media flow
July 2007	B.Tech. in Electronics and Communication Engineering **Jaypee University of Information Technology, India**

Appointments

April 2019 - current	**Illinois Research Climatologist** Illinois State Water Survey, Prairie Research Institute University of Illinois at Urbana-Champaign, USA
Sept 2019 - current	**Graduate Faculty** The Department of Atmospheric Sciences University of Illinois at Urbana-Champaign, USA
Aug 2016 - April 2019	**Research Assistant Professor** Department of Civil & Environmental Engineering & Earth Sciences University of Notre Dame, USA
Aug 2014 - Aug 2016	**Post-doctoral Fellow** The Center for Sustainable Energy at Notre Dame (ND Energy) University of Notre Dame, USA
Aug 2012 - Aug 2016	**Post-doctoral Researcher** Environmental Change Initiative (ECI) University of Notre Dame, USA
June - Aug 2016 May - July 2014	**Visitor** Research Applications Laboratory (RAL) National Center for Atmospheric Research, USA

Honors

- Contributed as reviewer for the Intergovernmental Panel on Climate Change Sixth Assessment Report Working Group I (IPCC AR6 WGI); 2021
- Testified to the City of Chicago Committee on Environmental Protection and Energy on Subject Matter Hearing on Urban Heat Island Effect and Solutions; May 17, 2021

- Briefed the US Senate Climate Taskforce and Congressional Staff at the Capitol Hill in Washington DC on the Climate Change in the Great Lakes Region; July 9, 2019
- Fellow, Royal Meteorological Society (2016-present)
- Executive Committee Member, Illinois Center for Urban Resilience and Environmental Sustainability (IL-CURES) (2019-present)

Journal Editorships

- Associate Editor (2021 to date), Frontiers in Environmental Science: Atmosphere and Climate
- Guest Editor, Special Issue on "Interdisciplinary Climate Research for Urban Resiliency and Sustainability," Sustainability Journal.

Funding

External Grants

National Science Foundation (NSF): A Proposed Workshop on Interdisciplinary Sustainable Solutions for Urban Systems in a Changing Climate (Award no: 1929856); PI Donald Wuebbles, **Ashish Sharma**, Lei Zhao, and Amy Ando; duration: 05/01/2019 – 04/30/2020; $50,000

U.S. Department of Energy (DOE): A Proposed Workshop on Urban Scale Processes and their Representation in High Spatial Resolution Earth System Models; PI Donald J. Wuebbles (UIUC), Katherine Calvin (PNNL), Charles Catlett (ANL), Beth Drewniak (ANL), Rao Kotamarthi (ANL), **Ashish Sharma** (UIUC): 10/01/2018 - 09/30/2019; $72,271

National Aeronautics and Space Administration (NASA): A Proposed Workshop on Urban Scale Processes and their Representation in High Spatial Resolution Earth System Models; PI Donald J. Wuebbles (UIUC), Katherine Calvin (PNNL), Charles Catlett (ANL), Beth Drewniak (ANL), Rao Kotamarthi (ANL), **Ashish Sharma** (UIUC): 11/20/2018-11/19/2019; $20,581

National Oceanic and Atmospheric Administration (NOAA): A Proposed Workshop on Urban Scale Processes and their Representation in High Spatial Resolution Earth System Models; PI Donald J. Wuebbles (UIUC), Katherine Calvin (PNNL), Charles Catlett (ANL), Beth Drewniak (ANL), Rao Kotamarthi (ANL), **Ashish Sharma** (UIUC): 10/01/2018-09/30/2019; $17,626

U.S. Department of Defense (DOD): A Proposed Workshop on Urban Scale Processes and their Representation in High Spatial Resolution Earth System Models; PI Donald J. Wuebbles (UIUC), Katherine Calvin (PNNL), Charles Catlett (ANL), Beth Drewniak (ANL), Rao Kotamarthi (ANL), **Ashish Sharma** (UIUC): 10/01/2018 - 09/30/2019; $23,440

EPA Great Lakes Restoration Initiative (GLRI): Cover crops prevent nutrient runoff and promote climate resiliency in Great Lakes watersheds (GL 00E02207); PI Alan Hamlet (ND), **Ashish Sharma (ND)**, Jennifer Tank (ND), Sheila Christopher (ND), and Todd Royer (IU); duration: 08/01/2017 – 07/31/2020; $564,314

National Institute of Aerospace and NASA; Graduate student scholarship award; duration 2008-09; PI **Ashish Sharma (ASU)**; $5,875

Computing Grants

NCAR Yellowstone supercomputing grant: Evaluating the impact of green roofs; PI: **Ashish Sharma (ND)**; duration 2014-2018; 100,000 core computing hours

The Great Lakes Consortium for Petascale Computation (GLCPC) computational grant: Very high-resolution numerical modeling for climate extremes in Midwest U.S.; PI: **Ashish Sharma (ND)**, co-PI HJS Fernando (ND), Jessica Hellmann (UMN), Rao Kotamarthi (ANL); duration 2014-2015; 5.5 million core computing hours

Internal Grants, University of Illinois at Urbana-Champaign

The Institute for Sustainability, Energy, and Environment (iSEE): Initial Development and Testing of a cyberGIS System for Urban Sustainability; PI Donald Wuebbles (UIUC), **Ashish Sharma**, Shaowen Wang; duration 01/2019-12/2019; $29,996

Internal Grants, University of Notre Dame

Notre Dame International (NDI): Urban Sustainability Solutions to Mitigate Climate Change for Exponentially Growing Populations in New Delhi; PI: **Ashish Sharma (ND)**, co-PI HJS Fernando (ND), Alan Hamlet (ND); duration 07/2017-06/2018; $20,000

The Center for Sustainable Energy at Notre Dame (ND Energy): Energy sustainable solutions using green infrastructure for an urban environment; PI: **Ashish Sharma (ND)**; duration 07/2015-06/2017; $50,000

University of Notre Dame/Pontifical Catholic University of Chile internal grant: Climatic Impacts on Environmental Quality in Urban Santiago; PI Laura Leo (ND), co-PI HJS Fernando (ND), **Ashish Sharma (ND)**, Reneta Dimitrova (ND). duration: 07/2013-06/2014; $40,000

Travel Grants

NCAR travel award 2016: Urban sustainable solutions for energy and air quality impacts using green infrastructure; PI: **Ashish Sharma (ND)**; $3,200

Peer-reviewed Publications **(students are marked with *)**

20. **Sharma, A.**, Wuebbles, D. J., Kotamarthi, R. (2021). The Need for Urban-Resolving Climate Modeling Across Scales. *AGU Adv.*, https://doi.org/10.1029/2020AV000271.
Editor's highlighted paper: Modeling Interactions Between Cities and Climate Across Scales; https://eos.org/editor-highlights/modeling-interactions-between-cities-and-climate-across-scales

19. Wuebbles, D. J., **Sharma, A.**, Ando, A., Zhao, L. & Rigsbee, C. (2020). Converging on Solutions to Plan Sustainable Cities. *Eos*, 101; doi: https://doi.org/10.1029/2020EO150149.

18. Fernando, H.J.S., Gultepe, I., Dorman, C., Pardyjak, E., Wang, Q., Hoch, S.W., Richter, D., Creegan, E., Gaberšek, S., Bullock, T., Hocut, C., Chang, R., Alappattu, D., Dimitrova, R., Flagg, D., Z Grachev, A., Krishnamurthy, R., Singh, D.K., Lozovatsky, I., Nagare, B., **Sharma, A.**, Wagh, S., Wainwright, C., Wroblewski, M., Yamaguchi, R., Bardoel1, S., Coppersmith, R.S., Chisholm, N., Gonzalez, E., Gunawardena, N., Hyde, O., Morrison, T., Olson, A., Perelet, A., Perrie, W., Wang, S. & Wauer, B. (2020). C-FOG: Life of Coastal Fog. *Bull. Am. Meteorol. Soc.*, pp.1-53, doi: https://doi.org/10.1175/BAMS-D-19-0070.1

17. **Sharma, A.**, Wuebbles, D. J., Kotamarthi, R., Calvin, K., Drewniak, B., Catlett, C. E. & Jacob, R. (2020). Urban Scale Processes in High Spatial Resolution Earth System Models (ESMs). *Bull. Am. Meteorol. Soc.*, 101 (9): E1555–E1561. doi: https://doi.org/10.1175/BAMS-D-20-0114.1

16. Dimitrova, R., Danchovski, V., Egova, E., Vladimirov, V., **Sharma, A.**, Gueorguiev, O. & Ivanov, D. (2019). Modeling the Impact of Urbanization on Local Meteorological Conditions in Sofia City. *Atmosphere*, 10(7), 366; doi: https://doi.org/10.3390/atmos10070366

15. Kristovich, D.A., E. Takle, G.S. Young & **Sharma, A.** (2019). 100 Years of Progress in Mesoscale Planetary Boundary Layer Meteorological Research. *American Meteorological Society 100-Year Anniversary Monograph*, doi: https://doi.org/10.1175/AMSMONOGRAPHS-D-18-0023.1

14. **Sharma, A.**, Hamlet, A. F., Fernando & H.J.S. (2019). Lessons from Inter-Comparison of Decadal Climate Simulations and Observations for the Midwest U.S. and Great Lakes Region. *Atmosphere*, 10(5), 266; doi: https://doi.org/10.3390/atmos10050266.

13. Pithani, P.*, Ghude, S., Naidu, C.V., Kulkarni, R.G., Steeneveld, G-J., **Sharma, A.**, Prabhakaran, T., Chate, D.M., Gultepe, I., Jenamani, R.K. & Rajeevan, M. (2018) WRF Model

Prediction of a Dense Fog Event Occurred During the Winter Fog Experiment (WIFEX). *Pure Appl. Geophys.*, 176(4), pp.1827-1846. doi: https://doi.org/10.1007/s00024-018-2053-0.

12. **Sharma, A.**, Hamlet, A.F., Fernando, H.J.S., Catlett, C.E., Horton, D.E., Kotamarthi, V.R., Kristovich, D.A.R, Packman, A.I., Tank, J.L. & Wuebbles, D.J. (2018). The need for an integrated land-lake-atmosphere modeling system, exemplified by North America's Great Lakes region. *Earth's Future*, doi: https://doi.org/10.1029/2018EF000870.

11. **Sharma, A.**, Woodruff, S., Budhathoki, M., Hamlet, A. F., Fernando, H.J.S. & Chen, F. (2018). Role of green roofs in reducing heat stress in vulnerable urban communities - A multidisciplinary approach. *Environ. Res. Lett.*, 13(9), p.094011. doi: https://doi.org/10.1088/1748-9326/aad93c.

10. **Sharma, A.**, Huang, H.-P., Zavialov, P. & Khan, V. (2017). Impact of desiccation of Aral Sea on the regional climate of Central Asia using WRF model. *Pure Appl. Geophys.*, 175(1), pp.465-478. doi: https://doi.org/10.1007/s00024-017-1675-y.

9. **Sharma, A.**, Fernando, H.J.S., Hamlet, A. F., Hellmann, J. J., Barlage, M. & Chen, F. (2017). Urban meteorological modeling using WRF: a sensitivity study. *Int. J. Climatol.* , 37(4), 1885–1900. doi: https://doi.org/10.1002/joc.4819.

8. Kulkarni, P. S., Dasari, H. P., **Sharma, A.**, Bortoli, D., Salgado, R. & Silva, A. M. (2016). Nocturnal surface ozone enhancement over Portugal during winter: Influence of different atmospheric conditions. *Atmos. Environ.*, 147, 109–120. doi: https://doi.org/10.1016/j.atmosenv.2016.09.056.

7. **Sharma, A.**, *Conry, P., Fernando, H.J.S., Hamlet, A. F., Hellmann, J. & Chen, F. (2016). Green and cool roofs to mitigate urban heat island effects in the Chicago metropolitan area: evaluation with a regional climate model. *Environ. Res. Lett.*, 11(6), 64004. doi: https://doi.org/10.1088/1748-9326/11/6/064004.

6. *Arifin, R. R., James, S. C., de Alwis Pitts, D. A., Hamlet, A. F., **Sharma, A.** & Fernando, H.J.S. (2016). Simulating the thermal behavior in Lake Ontario using EFDC. *J. of Great Lakes Res.*, 42(3), 511–523. doi: https://doi.org/10.1016/j.jglr.2016.03.011.

5. *Conry, P., **Sharma, A.**, Potosnak, M. J., Leo, L. S., Bensman, E., Hellmann, J. J. & Fernando, H.J.S. (2015). Chicago's heat island and climate change: bridging the scales via dynamical downscaling. *J. Appl. Meteor. Climatol.*, 54(7), 1430–1448. doi: https://doi.org/10.1175/JAMC-D-14-0241.1.

4. **Sharma, A.**, *Bouchard, F., *Ryan, S., *Parker, D. & Hellmann, J. J. (2013). Species are the building blocks of ecosystem services and environmental sustainability. *Ethics, Policy Environ.*, 16(1), 29–32. doi: https://doi.org/10.1080/21550085.2013.768388.

3. **Sharma, A.** & Huang, H.-P. (2012). Regional climate simulation for Arizona: impact of resolution on precipitation. *Adv. Meteorology*, 2012, 13 pp. doi: http://dx.doi.org/10.1155/2012/505726.

2. **Sharma, A.** (2012). Climate Modeling Downscaling for Semi-Arid Regions, *ProQuest Dissertations And Theses; Thesis (Ph.D.)–Arizona State University*, 2012.; Publication Number: AAT 3525717; ISBN: 9781267592309; Source: Dissertation Abstracts International, 74-01(E), Section: B.; 150 p.

1. **Sharma, A.**, *Brown, J. & Fernando, H.J.S. (2011). Numerical Modeling of Flow in the Condensate Polisher Vessel of a Nuclear Reactor, with Applications to PVNGS. *Nuclear Technology*, 174(1), 18–28. doi: https://doi.org/10.13182/NT11-A11676.

Under review

1. Dimitrova, R., **Sharma, A.**, Fernando, H.J.S., Gultepe, I., Danchovski, V., Wagh, S., Bardoel, S. & Wang, S. (2020). WRF model simulations for coastal fog prediction. *Bound.-Layer Meteorol.*, (in review).

2. Byun, K., **Sharma, A.**, Wang, J., Tank, J.L., Royer, T.V. & Hamlet, A.F. (2020). Intercomparison of Dynamically and Statistically Downscaled Climate Change Projections over the Midwest and Great Lakes Region. *J. Hydrometeorol.*, (in review).

3. Zhou, L., Wuebbles, D., **Sharma, A.**, Sanyal, S., Budhathoki, M., and Wang, S. (2020). Temperature impacts on crime rates in Chicago. *Sci. Total Environ.*, (in review).

Scientific Reports

7. 2021 Climate Action Plan for the Chicago Region. Metropolitan Mayors Caucus (MMC), Illinois (forthcoming).

6. Wuebbles, D., J. Angel, K. Petersen, and A.M. Lemke, (Eds.), 2021: An Assessmen of the Impacts of Climate Change in Illinois. The Nature Conservancy, Illinois.
URL: https://doi.org/10.13012/B2IDB-1260194$_V$1

5. Huang, J., Mariotti, A., Selz, V., Barros, A., Delworth, T., Hurrell, J., Williams, E., **Sharma, A.**, Lombardozi, D., Fu, R., Naik, V., Vose, R., Ming, Y., Lynch, P., Chang, E., Trtanj, J., Frost, G. (2020). Report on Climate Research to Enhance Resilience to Extreme Heat — Aligning research priorities with stakeholder needs. Earth System Science and Modeling Division (ESSM): Extreme Heat Workshop, November 2019, Climate Program Office, National Oceanic and Atmospheric Administration (NOAA).

4. Wuebbles, D., Kotamarthi, R., **Sharma, A.**, Drewniak, B., Calvin, K., Catlett, C., Jacob, R. (2020). Report: Workshop on Urban Scale Processes and their Representation in High Spatial Resolution Earth System Models, Report to the U.S. Department of Energy, Army Research Office, National Aeronautics and Space Administration, and National Oceanic and Atmospheric Administration.

3. Ando, A., Hanson, A-M., Kocs, A., Klein-Banai, C., Massey, D., Rigsbee, C., **Sharma, A.**, Wuebbles, D., Zellner, M., Zhao, L. (2019). Sustainable Urban Systems Workshop Report: A Proposed Workshop on Interdisciplinary Sustainable Solutions for Urban Systems in a Changing Climate, National Science Foundation.
URL: https://dpi.uillinois.edu/UserFiles/Servers/Server$_9$64145/$File/CURES-2019-NSF-report-final.pdf$

2. Wuebbles, D., Cardinale, B., Cherkauer, K., Davidson-Arnott, R., Hellmann, J., Infante, D., Johnson, L., Loë, R., Lofgren, B., Packman, A., Seglenieks, F., **Sharma, A.**, Sohngen, B., Tiboris, M., Vimont, D., Kunkel, K., Ballinger, A. (2019). An Assessment of the Impacts of Climate Change on the Great Lakes, The Environmental Law Policy Center the Chicago Council on Global Affairs. URL: http://elpc.org/wp-content/uploads/2019/03/Great-Lakes-Climate-Change-Report.pdf

1. Fernando, H.J.S. **Sharma, A.** (2009). Numerical Modeling of Flow in the Condensate Polisher Vessel of a Nuclear Reactor: Implications of modifications, Arizona Public Service (APS) PO 500529566).

Magazine Articles

1. The Conversation (2019): "Adapting cities to a hotter world: 3 essential reads"
URL: https://theconversation.com/adapting-cities-to-a-hotter-world-3-essential-reads-120634

2. The Conversation (2018): "Low-income neighborhoods would gain the most from green roofs in cities like Chicago"
URL: https://theconversation.com/low-income-neighborhoods-would-gain-the-most-from-green-roofs-in-cities-like-chicago-102234

3. The Conversation (2016): "Green and cool roofs provide relief for hot cities, but should be sited carefully"

URL: https://theconversation.com/green-and-cool-roofs-provide-relief-for-hot-cities-but-should-be-sited-carefully-60766

4. Fonderist Magazine (2016): "Green, Cool Roofs May Be Key To Cooling Cities Down"
URL: http://www.fondriest.com/news/green-cool-roofs-may-key-cooling-cities.htm

Conference Proceedings **(students are marked with *)**

Sharma, A., *Vaidya, H.M., Budhathoki, M. and Wei, J.C., 2020: Impact on global air quality due to reduced mobility from COVID-19 related shutdowns. *AGU Fall Meeting Abstracts 2020*, San Francisco (virtual), 16 December 2020.

Sharma, A., Wuebbles, D.J. and Catlett C., 2020: Bridging urban scales using modeling and measurements for improved urban sustainability. *AGU Fall Meeting Abstracts 2020*, San Francisco (virtual), 8 December 2020. (invited).

Sharma, A., Wuebbles, D.J., Wei, J.C., *Vaidya, H.M., Binita, K.C. and Budhathoki, M., 2020: Changes in global air quality due to reduced mobility from COVID-19 related shutdowns. *World Meteorological Organization and American Geophysical Union symposium*, Climatological, Meteorological and Environmental factors in the COVID-19 pandemic, 4-6 August 2020. (Virtual)

Kristovich, D.A., E. Takle, G.S. Young, **Sharma, A.**, 2020: 100 Years of Progress in Mesoscale Planetary Boundary Layer Meteorological Research. *In 100th American Meteorological Society Annual Meeting and 18th History Symposium*. American Meteorological Society.

Sanyal, S., Wuebbles, D.J., Tilmes, S., Liang, X.Z., Wang, S.W. and **Sharma, A.**, 2019: Changing Climate And Its Effect On Urban Life: Ozone and Particulate Matter exceedance events and a CyberGIS toolkit for Urban Sustainability. *AGU Fall Meeting Abstracts*, San Francisco.

Sharma, A., Budhathoki, M., Sanyal, S., Wuebbles, D.J. and Lei, Z., 2019: Understanding relationships between demography and climate change to improve urban resiliency: A case study. *AGU Fall Meeting Abstracts*, San Francisco.

Dimitrova, R., **Sharma, A.**, Fernando, H.J.S., Wang, S. and Wagh, S.D., 2019: High Resolution Numerical Simulations of Advection Fog Events during C-FOG Field Campaign. *AGU Fall Meeting Abstracts*, San Francisco.

Byun, K., **Sharma, A.**, Hamlet, A.F, Tank, J., Royer, T., 2019: Intercomparison of Midwest Precipitation Changes from Statistical and Dynamical Downscaling Methods. *IAGLR 2019*. International Association for Great Lakes Research, Brockport NY, June 7-14, 2019.

Julie Tompkins*, Anna E. Klene, **Sharma, A.**, Silverman, Nick Silverman, VonReichert Christiane, 2018: Just open a window: Understanding the combined effects of heat and smoke on a mountain community in the western United States, Missoula, Montana. Abstract PA21D-1312 *In AGU Fall Meeting Abstracts 2018*, AGU, Washington, D.C.

Mariana Silva*, M., **Sharma, A.**, Budhathoki, M., Jain, R. and Catlett, C.E. 2018: Neighborhood scale heat mitigation strategies using Array of Things (AoT) data in Chicago. Abstract PA21D-1312 *In AGU Fall Meeting Abstracts, 2018*, AGU, Washington, D.C.

Sharma, A., Woodruff, S., Budhathoki, M., Hamlet, A. F., Fernando, H.J.S. and Chen F., 2018: Can green roofs reduce urban heat stress in vulnerable urban communities: A coupled atmospheric and social modeling approach. *EGU General Assembly 2018, Geophysical Research Abstracts Vol. 20, EGU2018-9549, 2018*, Vienna, Austria.

Sharma, A., Kumar, R., Fernando, H.J.S., Hamlet, A., Chen F. and Krishnamurthy, R. 2018: Impact of land data assimilation on meteorology and air quality. *EGU General Assembly 2018, Geophysical Research Abstracts Vol. 20, EGU2018-10704-1, 2018*, Vienna, Austria.

Sharma, A., Woodruff, S., Budhathoki, M., Hamlet, A. F., Fernando, H.J.S. and Chen F., 2017: Can green roofs reduce urban heat stress in vulnerable urban communities: A coupled atmospheric and social modeling approach. *In AGU Fall Meeting Abstracts*, New Orleans.

Woodruff, S., **Sharma, A.**, 2017: Planning for heat: can green infrastructure reduce exposure of the most vulnerable neighborhoods? *57th Association of Collegiate Schools of Planning (ACSP) Annual Conference*, Denver.

Fernando, H.J.S., Conry, P., **Sharma, A.**, 2017: Effects of Climate Change on Cities: Dynamical Downscaling to Pedestrian Scale. *In 97th American Meteorological Society Annual Meeting and 13th Symposium of the Urban Environment*. American Meteorological Society, Seattle.

Sharma, A., Kumar, R., Martilli, A., Fernando, H.J.S., Hamlet, A., Chen, F., 2017: Urban Sustainable Solutions for Energy and Air Quality Impacts Using Green Infrastructure. *In 97th American Meteorological Society Annual Meeting and 13th Symposium of the Urban Environment*. American Meteorological Society, Seattle.

Sharma, A., *Conry, P., Fernando, H.J.S., Hamlet, A. F., Hellmann, Chen, F., 2016: Green and Cool Roofs to Mitigate Urban Heating: An Analysis with a Regional Climate Model. *Themed Joint Session: Helping Society Mitigate and Adapt to Climate Variability and Change, 96th American Meteorological Society Annual Meeting*, Jan 11-14, 2016 (paper TJ14.4), New Orleans.

Sharma, A., Fernando, H.J.S., Hamlet, A. F., Hellmann, J.J., Barlage, M., and Chen, F., 2015: Sensitivity of WRF model to landuse, with applications to Chicago metropolitan Urban Heat Island and lake breeze. *In AGU Fall Meeting Abstracts*, San Francisco.

Sharma, A., Kulkarni, P.S., Dasari, H.P, Bortoli, D., Salgado, R., and Silva, A.M., 2015: Nocturnal surface ozone enhancement over Portugal: Influence of different atmospheric conditions. *AGU Fall Meeting Abstracts*, San Francisco.

Hamlet, A. F., Bolster, D., Tank, J. L., Hellmann, J., Christopher, S. F., **Sharma, A.**, Chiu, C. M., 2014: An Overview of Interdisciplinary Research at Notre Dame Addressing" Grand Challenges" in the Midwest and Great Lakes Region. *In AGU Fall Meeting Abstracts* (Vol. 1, p. 0756).

Sharma, A., Fernando, H.J.S., Hellmann, J.J., and Chen, F., 2014: Sensitivity of high-resolution regional climate model to urban parameterizations for Chicago metropolitan area, *15th Annual WRF Users Workshop*, NCAR, Boulder, USA.

*Arifin, R.R., De Alwis Pitts, D.A., James, S.C., **Sharma, A.**, Fernando, H.J., And Suhardjo, A., 2014: Numerical Modeling of Spring Thermal Bar Evolution in Lake Ontario using the EFDC model, *14th Annual Great Lakes Beach Association Conference, GLBA*, 12-14 November, Toronto, Canada.

Sharma, A., Hellmann, J., Fernando, H.J.S., and Chen, F., 2014: Sensitivity of WRF Model to Urban Parameterizations, With Applications to Chicago Metropolitan Urban Heat Island, *Proceedings of the 4th Joint US-European Fluids Engineering, Chicago. Paper No. FEDSM2014-21292, pp. V01DT28A002*, 10 pages. doi: https://doi.org/10.1115/FEDSM2014-21292

*Conry, P., **Sharma, A.**, Fernando, H.J.S., Leo, L.S., Potosnak, M., and Hellmann, J., 2014: Multi-Scale Simulations of Climate-Change Influence on Chicago Heat Island, *Proceedings of the 4th Joint US-European Fluids Engineering, Chicago, Paper No. FEDSM2014-21581, pp. V01DT28A007*, 11 pages. doi:10.1115/FEDSM2014-21581.

*Conry, P., **Sharma, A.**, Potosnak, M., Hellmann, J., and Fernando, H.J.S., 2014: Multi-scale Study of Chicago Heat Island and the Impacts of Climate Change, Extended Abstracts, *11th Symposium on the Urban Environment, American Meteorological Society 94th Annual Meeting, Paper 3.6*, Atlanta, GA.

*Conry, P., **Sharma, A.**, Fernando, H.J.S., Potosnack, M. And Hellman, J.: Multi-scale Modelling of Chicago Urban Heat Island and Climate-Change Impacts, Extended Abstracts, *16th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, 8-11 September 2014, Varna, Bulgaria.

Fernando, H.J.S., Bhat, G.N. and **Sharma, A.**, 2013: The Battle of Fluids: Air, Water and Climate, *35th IAHR World Congress*, 8-13 September 2013, Chengdu, China.

*Conry, P., **Sharma, A.**, Leo, L., Fernando, H.J.S., Potosnak, M., Hellmann, J., 2013: Modeling and measuring neighborhood scale flow, turbulence, and temperature within Chicago heat island. *Bulletin of the American Physical Society*, 58.

*Arifin, R.R., De Alwis Pitts, D.A., **Sharma, A.**, James, S.C., Fernando, H.J., And Suhardjo, A., 2013: Modeling the Formation and Propagation of Thermal Bar in Lake Ontario, *56th Annual Conference on Great Lakes Research*, 2-6th June, West Lafayette.

*Conry, P., **Sharma, A.**, L. S. Leo, J. Hellmann, and H.J.S. Fernando, 2013: High Resolution Simulations of Chicago Heat Island Natural Landscapes and its Response to Climate Change, *Change the Common Good: Security, Sustainability and Policy*, University of Notre Dame, IN.

*Arifin, R.R., De Alwis Pitts, D.A., **Sharma, A.**, James, S.C., Fernando, H.J., and Suhardjo, A., 2013: Modeling the Formation of Thermal Bar in Lake Ontario using Climatological Parameters, Climate *Change the Common Good*, University of Notre Dame, IN.

Huang, H. P., Hunt, J., **Sharma, A.**, *Tse, L., Fernando, H., *Gunawan, A., *Thompson, M., 2011: Axially asymmetric rotating tank experiments for thermally forced stationary waves in geophysical fluids. *Bulletin of the American Physical Society*, 56.

Sharma, A., *Brown, J., and Fernando, H.J.S., 2011: A CFD Investigation of Modification Options to Minimize Separation During Resin Bed Replacement in a PWR Condensate Demineralizer Vessel, *International Conference on Nuclear Engineering, ICONE19-43546*, American Society of Mechanical Engineers.

Sharma, A., Huang, H.-P., 2011: Impact of model resolution on rainfall for Arizona using WRF model, *12th Annual WRF Users Workshop*, NCAR, Boulder, USA.

Sharma, A., Huang, H.-P., 2010: Climate downscaling for Arizona using WRF: Dependence of precipitation on model resolution and convective parameterization, *11th Annual WRF Users Workshop*, NCAR, Boulder, USA.

Invited Talks

Angel, J., Ford, T., **Sharma, A.** (2021). An Assessment of the Impacts of Climate Change in Illinois. *Illinois State Agencies Working Group*, April 13, 2021. (webinar)

Sharma, A. (2020). Integrated Climate Research for Improved Sustainability, *Illinois Climate Working Group*, November 10, 2020.(webinar)

Sharma, A. (2020). Interdisciplinary Modeling Across Scales for Urban Resiliency and Sustainability, *Big 10 Workshop on Urban Issues, virtual workshop*, October 1, 2020.

Sharma, A. (2020). Interdisciplinary approaches to improve resiliency at scales for humans and ecosystems to thrive, *Jaypee University of Information Technology*, August 29, 2020, Solan, India. (webinar)

Sharma, A. (2020). COVID-19, Weather, Health: A global perspective, *National Remote Sensing Day, Indian Society for Remote Sensing*, August 12, 2020, Kolkata, India. (webinar)

Sharma, A. (2020). COVID-19, Weather, Health *Illinois Climate Working Group*, June 9, 2020.

Sharma, A. (2020). COVID-19, Weather, Health *University of Illinois Foundation and the National Center for Supercomputing Applications*, May 19, 2020.

Sharma, A. (2020). COVID-19, Weather, Health *University of Illinois Foundation and the National Center for Supercomputing Applications*, May 19, 2020, Champaign, IL.

Sharma, A. (2020). Bridging spatial scales for urban impacts: Modeling to Measurements. *At India Meteorological Department (IMD)*, March 3, 2020, New Delhi, India.

Sharma, A. (2020). Bridging scales for societal impacts: Modeling to Measurements. *At Indian Institute of Tropical Meteorology (IITM)*, February 27, 2020, Pune, India.

Sharma, A. and Chen, L. (2020). How will climate change affect Illinois communities,and what can we do? *125 Years of Water and Weather, Illinois State Water Survey*, February 4, 2020, Champaign, IL.

Sharma, A. (2019). Interdisciplinary modeling approaches to improve resiliency, *Atmospheric Sciences Seminar, The Department of Atmospheric Sciences*, December 3, 2019, University of Illinois at Urbana-Champaign, IL.

Sharma, A. (2019). Lessons learnt from Workshop on Urban Scale Processes and their Representation in High Spatial Resolution Earth System Models, *Annual ESSM Community Workshop 2019 Theme: Climate Research to Enhance Resilience to Extreme Heat, 2019 CPO ESSM Workshop and Annual Council Meeting*, November 18-19, 2019, Silver Spring, MD.

Sharma, A. (2019). Interdisciplinary modeling approaches to improve resiliency, *Ven Te Chow Hydrosystems Seminar Series, Illinois Water Resources Engineering and Science (WRES), Civil and Environmental Engineering*, October 4, 2019, University of Illinois at Urbana-Champaign, IL.

Sharma, A. (2019). Climate Change and Social Justice, *Institute of Social and Economic Research (ISER)*, August 9, 2019, University of Alaska, Anchorage, AK.

Sharma, A. (2019). Climate Modeling to Alleviate Urban Heat, *Fighting Urban Heat with Green: Adaptation and Mitigation Strategies; Mansueto Institute of Urban Innovation*, May 9-10, 2019, University of Chicago, IL.

Sharma, A. (2019). Climate Modeling and Impact Assessment at Scales Humans and Ecosystems Thrive, *Department of Earth, Atmospheric, and Planetary Sciences (EAPS)*, January 24, 2019, Purdue University, IN.

Sharma, A. (2018). Global Warming and Social Justice: Fighting for Vulnerable Chicago Neighborhoods, *2018 Energy Week, ND Energy*, September 17, 2018, University of Notre Dame, IN.

Sharma, A. (2018). Climate modeling at scales humans and ecosystems thrive, *Illinois State Water Survey)*, September 7, 2018, University of Illinois at Urbana-Champaign, IL.

Sharma, A. (2018). Urban Microscale Modeling and Developing Heat Mitigation Strategies, *Array of Things (AoT) Users Workshop: Lightening talks*, August 29-30, 2018, Argonne National Laboratory, IL.

Hamlet, A.F., **Sharma, A.** (2018). Assessment of Climate Change Impacts in the Midwest and Great Lakes Region Using Multi-Scale Modeling Strategies, *Environmental Engineering Seminar*, May 25, 2018, Northwestern University, IL.

Sharma, A. (2018). ISWS Seminar: Climate Modeling and Impact Assessment in the Midwest and Great Lakes Region Using Multi-Scale Modeling Approach, *Illinois State Water Survey, Prairie Research Institute*, May 16, 2018, University of Illinois at Urbana-Champaign, IL.

Sharma, A. (2018). An interdisciplinary approach for modeling and impact assessment of urban climates, *Department of Physics and Astronomy*, April 16, 2018, University of Bologna, Italy.

Sharma, A. (2018). Multiscale Climate Modeling and Impact Assessment of Meteorology, Energy and Air Quality at Urban Scales, *Army Research Laboratory*, January 29, 2018, White Sands Missile Range (WSMR), New Mexico.

Sharma, A. (2018). Modeling and Impact Assessment of Meteorology, Energy and Air Quality at Urban Scales, *Mathematics and Computer Science (MCS) Seminar Series*, January 11, 2018, Argonne National Lab., IL.

Sharma, A. (2017). Urban Climate Modeling: Current Future Research Directions at University of Notre Dame. *At Indian Institute of Science Education and Research (IISER)*, October 19, 2017, Pune, India.

Sharma, A. (2017). Urban Climate Modeling: Current Future Research Directions at University of Notre Dame. *At Indian Institute of Tropical Meteorology (IITM)*, October 18, 2017, Pune, India.

Sharma, A. (2016). Climate modeling at scales people and ecosystems live: an urban climate modeling perspective. *At Research Applications Laboratory, National Center for Atmospheric Research (NCAR)*, July 1, 2016, Boulder, CO.

Sharma, A. (2016). Regional Climate Modeling: Current Future Research Directions at the University of Notre Dame. *At Brown bag lunch, Environmental Change Initiative (ECI), University of Notre Dame*, Febrary 10, 2016, Notre Dame, IN.

Sharma, A. (2016). Climate modeling at scales people and ecosystems live: Urban Climate Modeling, *The Urban Climate Institute*, University of Minnesota, July 13, 2016, St. Paul, MN.

Sharma, A., (2015). Sensitivity of WRF model to landuse, with applications to Chicago metropolitan Urban Heat Island and lake breeze, *AGU Fall Meeting*, December 16, 2015, San Francisco, CA.

Sharma, A., (2015). Green and cool roofs to combat urban heating in Chicago: Evaluation with WRF regional climate model, *ND Energy seminar series 2015*, September 16, 2015, University of Notre Dame, IN.

Sharma, A., (2014). Climate Modeling at scales humans and ecosystems live, *Environmental Fluid Dynamics seminar series 2014*, November 18, 2014, University of Notre Dame, IN.

Sharma, A., and L. S. Leo, (2013). Impact of climate change on urban heat island, *Urban Landscapes and Climate Change Workshop*, August 27, 2013, Argonne National Lab., IL.

Sharma, A., (2012). Climate Modeling Downscaling and interactions with Ecosystems, *Environmental Fluid Dynamics Seminar Series 2012*, September 18, 2012, University of Notre Dame, IN.

Sharma, A., (2012). Climate Modeling Downscaling for Semi-Arid Regions, *Atmospheric Sciences Division Seminar Series 2012*, February 14, 2012, Brookhaven National Laboratory, NY.

Panel Discussions

2020: **Panelist**. Effects on air quality due to COVID-19 related shutdowns and its impact on health, Illinois Climate Working Group, June 9, 2020. (Webinar)

2020: **Panelist**. Urban Heat Impacts & Solutions, *A Chicago Regional Climate Plan — Climate Impacts & Hazards Webinar Series*, Metropolitan Mayors Caucus (MMC) and Chicago Metropolitan Agency for Planning, May 29, 2020. (Webinar)

2020: **Panelist**. COVID-19, Climate Change, and Health *University of Illinois Foundation and the National Center for Supercomputing Applications*, University of Illinois, May 19, 2020. (Webinar)

2019: **Moderator**. Engineering perspective to urban woes and potential solutions across scales, *Illinois Center for Urban Resilience and Environmental Sustainability (IL-CURES)*, CURES Connections Workshop: New Voices and Paths to Urban Sustainability, Discovery Partners Institute, Chicago, IL, August 7-8, 2019.

2018: **Panelist**. Urban Systems: Capabilities and Tools panel, *Illinois Center for Urban Resilience and Environmental Sustainability (IL-CURES)*, University of Illinois at Urbana-Champaign, IL, August 20-21, 2018.

Miscellaneous

2019: Attended invited meeting by Metropolitan Mayors Caucus, Environmental committee meeting on the Greenest Region Compact, June 26, 2019

Teaching Experience

Sustainability Minor, University of Notre Dame
Instructor, Sustainability: Principles and Practices, Fall 2017

Summer Bridge Program, Arizona State University
Instructor, Freshman Mathematics, Summer 2010, Summer 2011

Mechanical & Aerospace Engineering, Arizona State University
Teaching Assistant, Numerical Methods of Engineer, Spring 2008

Outreach

University Service
1. Outreach for the Center for Sustainable Energy at Notre Dame events to share with public the impact of urban heating and mitigation strategies.
2. Notre Dame Day: LIVE remote from the roof of the Morris Inn.
URL: https://goo.gl/zAgHHs

K-12 school students
1. Interviewing for K-12 students and inspiring them to pursue STEM education; helping them achieve STEM school projects.
2. Remotely advising high-school student on their science projects.

News and Media Coverage

Interviews
1. The Daily Northwestern (2019): "Report warns of climate change-related impacts on Great Lakes"
URL:https://dailynorthwestern.com/2019/04/07/city/report-warns-of-climate-change-related-impacts-on-great-lakes/
2. Columbia Chronicle (2018): "Green roofs take heat off low-income areas"
URL:http://http://https://columbiachronicle.com/0585cdb0-bd0e-11e8-bd63-ffca5ff75765
3. IOP Physics World (2018): "Computer model picks which roofs to make green"
URL:https://physicsworld.com/a/computer-model-picks-which-roofs-to-make-green/
4. Beyond Zero Emissions (BZE) Technology Radio Show (2016): 26 July 2016 Podcast in Australia on my overall urban climate research.
URL: http://bze.org.au/dr-ashish-sharma/
5. Vice Impact (2016): "A Deadly Heatwave Turned Chicago Into the Country's Green Roof Capital"
URL:https://goo.gl/kbJM3t

News
1. University of Notre Dame news release (2018): "New study shows ways to maximize temperature-lowering benefits of Chicago's green roofs"
URL: https://news.nd.edu/news/new-study-shows-ways-to-maximize-temperature-lowering-benefits-of-chicagos-green-roofs//

2. University of Notre Dame Engineering for a Better World Stories from Notre Dame's Department of Civil Environmental Engineering Earth Sciences (2017): "To the Frontline: Notre Dame Professors Build Collaborations in Bangladesh"
URL: http://ceees.nd.edu/stories/our-stories/to-the-frontline-notre-dame-professors-build-collaborations-in-bangladesh

3. University of Notre Dame news release (2016): "Cooling down Chicago: How green and cool

roofs could impact urban climate"
URL: http://news.nd.edu/news/cooling-down-chicago-how-green-and-cool-roofs-could-impact-urban-climate/

Media Coverage
1. CNBC (2018): "Low-income neighborhoods would gain the most from green roofs in cities like Chicago"
URL: https://www.cnbc.com/2018/09/07/low-income-neighborhoods-would-gain-the-most-from-green-roofs.html//

2. Next City, an urban affairs magazine (2018): "Detailed Maps Trace the Heat in Chicago Neighborhoods"
URL: https://nextcity.org/daily/entry/detailed-maps-trace-heat-chicago-neighborhoods//

3. News on the Capitol Hill briefing on "Climate Change Impacts on the Great Lakes.": "Scientists: Climate change could prompt a rebound – and problems – in Great Lakes region"
URL: https://buffalonews.com/2019/07/11/scientists-climate-change-could-prompt-a-rebound-and-problems-in-the-great-lakes-region/

Collaborations

International
1. Indian Institute of Tropical Meteorology, India: Urbanization Impact on the Natural Environment in Indian Cities (Sachin Ghude)
2. Environment Canada: Fog and Urban modeling (Ismail Gultepe)
3. University of Évora, Portugal: Nocturnal surface ozone enhancement (Pavan S. Kulkarni)

National: USA
1. Indiana University, Bloomington: School of Public and Environmental Affairs (Todd V. Royer)
2. National Center for Atmospheric Research (NCAR): Land-surface & urban modeling (Fei Chen)
3. National Center for Atmospheric Research (NCAR): Air quality modeling (Rajesh Kumar)
4. Argonne National Laboratory (ANL): High-resolution climate modeling for Midwest U.S. (Rao Kotamarthi and Jiali Wang)

Advising Students

High school summer interns

- David Krutz, UIUC; Summer 2019
- Tabeeb Kandaker, UIUC; Summer 2019

Undergraduate students

- Mariana Silva, University of Notre Dame; 2018-19

Graduate students

- Hem Amit Vaidya, University of Illinois at Urbana-Champaign; 2020
- Margareth Viecco (Ph.D. committee memeber), Pontificia Universidad Católica de Chile, Santiago, Chile

Visiting Ph.D. students

- Nimish Gupta, Indian Institute of Technology (IIT) Kharagpur, India; Fall 2019
- Margareth Viecco, Pontificia Universidad Católica de Chile, Santiago, Chile; Summer 2018
- Prakash Pithani, Indian Institute of Tropical Meteorology (IITM), Pune, India, Summer 2017

Visiting Scholars

- Dr. Lei Zhou, Associate Professor, School of Geomatics and Urban Information, Beijing University of Civil Engineering and Architecture (Aug 2019 - July 2020)

Professional Service

Professional Affiliations
Fellow, Royal Meteorological Society (2016-present)
Member, American Association for the Advancement of Science (2019-present)
Member, American Meteorological Society (2015-present)
Member, American Geophysical Union (2011-present)

Service to the Profession

- Member of the Great Lakes Consortium for Petascale Computation (GLCPC) Blue Waters Allocations Committee for year 2016-2017.
- Scientific partner for American Geophysical Union Thriving Earth Exchange (AGU TEX) to work on heat vulnerability mapping project for Missoula, MT.
  URL: http://thrivingearthexchange.org/project/missoula-mt/
- Judge at American Geophysical Union (AGU) Fall Meeting for Outstanding Student Paper Awards (2015, 2019)

Conference Organization: Convenor or Co-convenor

- Workshop on 2019 CURES CONNECTIONS WORKSHOP: New Voices and Paths to Urban Sustainability – 2019, Discovery Partners Institute, August 7-8, 2019, Chicago, IL, USA.
  URL: https://dpi.uillinois.edu/research/cures_connections_workshop
- Workshop on Urban Scale Processes and their Representation in High Spatial Resolution Earth System Models – 2019, Argonne National Laboratory, May 22-24, 2019, Chicago, USA.
  URL: https://web.evs.anl.gov/urban-workshop/
- Mini-symposia on Urban Fluid Mechanics and member of local organizing committee of the 8th International Symposium on Environmental Hydraulics (ISEH) – 2018 conference, University of Notre Dame, June 4-7, 2018, Notre Dame, USA. URL: https://ceees.nd.edu/iseh2018

Conference/Workshop Session Chair

- Session chair for AGU 2020 Fall Meeting on "Extreme Weather and Climate in Urban Areas and Their Social Impacts and Mitigation"
- Session chair for AGU 2019 Fall Meeting on "Interdisciplinary Sustainable Solutions for Urban Areas"
- Session chair for urban session at the Annual ESSM Community Workshop 2019 Theme: Climate Research to Enhance Resilience to Extreme Heat, 2019: CPO ESSM Workshop and Annual Council Meeting, November 18-19, 2019, Silver Spring, MD.
- Session chair for Mini-Symposium: Urban Fluid Mechanics: 8th International Symposium on Environmental Hydraulics (ISEH) – 2018 conference, University of Notre Dame, June 4-7, 2018, Notre Dame, USA.

University Service

- Inviting seminar speakers at Climate and Atmospheric Science (CAS) seminar series (Illinois State Water Survey).
- Environmental Change Initiative (ECI) seed funding committee member (University of Notre Dame).

- Traveling for the University to establish long-term collaborations

Award Proposal Reviewer Service
National Science Foundation (NSF), Army Research Office (ARO), National Oceanic and Atmospheric Administration (NOAA), Great Lakes Consortium for Petascale Computation Blue Waters Allocations (GLCPC), Canada Foundation for Innovation (CFI), Netherlands Organisation for Scientific Research (NWO)

Reviewer Service
IPCC AR6, Advances in Atmospheric Sciences, Advances of Meteorology, AGU Advances, Atmosphere, Atmospheric Research, Boundary-Layer Meteorology, Environmental Fluid Mechanics, Environmental Research Letters, International Journal of Climatology, International Journal of Environmental Research and Public Health, Journal of Applied Meteorology Climatology, Journal of Geophysical Research-Atmospheres, Journal of Hydrology: Regional Studies, Journal of Water and Land Development, Meteorology and Atmospheric Physics, Nature, Pure and Applied Geophysics, Remote Sensing, Science of the Total Environment, Sustainability, Sustainable Cities and Society, Urban Climate

Languages

Native speaker of English and Hindi