

Anamika Shreevastava

NASA Earth Science Fellow, Doctoral candidate at Purdue University
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EDUCATION

Purdue University, West Lafayette, IN, USA

Aug '16 – Aug '20

PhD, Civil Engineering; Specialization: Urban Climate

(Expected)

Interdisciplinary Graduate Program of Ecological Sciences and Engineering

Advisor: Prof. Suresh Rao

Purdue University, West Lafayette, IN, USA

May '16

MS, Architectural Engineering; Specialization: Building Energy Modelling

Indian Institute of Technology, Roorkee, India

May '14

Bachelor of Technology, Civil Engineering

AWARDS AND RECOGNITIONS

NASA Earth and Space Science Doctoral Fellowship ([NESSE](#))

Sept '17 – Sept '20

- Won the 3-year doctoral fellowship awarded to Future Investigators of NASA Earth and Space Science Technology.
- Member of NASA's Land Cover Land Use Change (LCLUC) Team.

US Green Building Council's LEED Accredited Professional (AP)

April '16 – onwards

- Specialized in the design and construction phases of green buildings, serving the commercial, residential, education and healthcare sectors.

JOURNAL PUBLICATIONS

1. **Shreevastava, A.**, Rao, P. S. C., & McGrath, G. S. (2019). Emergent self-similarity and scaling properties of fractal intra-urban heat islets for diverse global cities. *Physical Reviews E (in press)*. Preprint available here - <https://eartharxiv.org/gxj9m/>
2. **Shreevastava, A.**, Bhalachandran, S., McGrath, G.S., Huber, M., & Rao, P.S.C. (2019). Paradoxical impact of sprawling intra-Urban Heat Islets: Reducing mean surface temperatures while enhancing local extremes. *Scientific Reports (in review)*. Preprint available here - <https://eartharxiv.org/t9s3g>.
3. Bhalachandran, S., Chavas, D. R., Marks, F. D., Dubey, S., **Shreevastava, A.**, & Krishnamurti, T. N. (2019). Characterizing the energetics of multiscale asymmetries during tropical cyclone rapid intensity changes. *Journal of Atmospheric Sciences (in review)*. Preprint available here - <https://arxiv.org/abs/1908.03618#>.
4. **Shreevastava, A.**, Rao, P. S. C., & McGrath, G. S. (2018, October). Spatial analysis of the Surface Urban Heat Island. *Land Surface and Cryosphere Remote Sensing IV* (Vol. 10777, p. 107770C). International Society for Optics and Photonics. Link - <https://doi.org/10.1117/12.2501441>.
5. Ching, J., et al including **Shreevastava, A.** (2018). WUDAPT: An urban weather, climate, and environmental modeling infrastructure for the Anthropocene. *Bulletin of the American Meteorological Society*, 99(9). Link - <https://doi.org/10.1175/BAMS-D-16-0236.1>.

INVITED SEMINARS AND TALKS

1. Center for Advanced Spatial Analysis (CASA), University College London, UK (August 2019).
2. NOAA Center for Earth System Sciences and Remote Sensing Technologies, New York (April 2019).
3. NASA Land Cover Land Use Change (LCLUC) Science Team meeting, Rockville, MD (April 2019).
4. NASA Ames, Mountain View, CA. (June 2018).

PRESENTATIONS IN CONFERENCES

1. **Shreevastava, A.,** Rao, P. S., & McGrath, G. S. (2018, December). Fractal topography of the intra-urban thermal landscape. *AGU Fall Meeting Abstracts, Washington, DC.*
2. **Shreevastava, A.,** McGrath, G., Rao, P.S.C. (2018, September) Spatial analysis of the Surface Urban Heat Island. *SPIE Asia-Pacific Remote Sensing Conference, Honolulu, HI.*
3. **Shreevastava, A.,** McGrath, G., Rao, P.S.C. (2017) Characterizing the intra-urban spatial structure of High Heat Stress Zones. *AGU Fall meetings, New Orleans, LA.*
4. **Shreevastava, A.,** Bhalachandran, S., Garcia-Dorado, I., Aliaga, D., and Niyogi, D. (2017) Incorporation of urban form and function for improved correlation between Land Use Types and Land Surface Temperatures. *97th AMS Annual Meeting, Seattle, WA.* 13th Symposium of the Urban Environment. **(Won the AMS Best Presentation Award)**
5. **Shreevastava, A.,** Bhalachandran, S., Krueger, E., Rao, P.S.C., Modak, P., and Niyogi, D. (2017) A Resilience Analysis of 100 Climate Proofing Strategies of the C-40 Cities. *97th AMS Annual Meeting, Seattle, WA.*

INTERNATIONAL COLLABORATIONS

Synthesis of Complex Networks Applications - Technological, Human & Ecological Dimensions

- Participated as a core member of the international research collaboration between Helmholtz Centre for Environmental Research (UFZ), Magdeburg; Technical University (TU), Dresden; University of Florida, Gainesville; Korea University, Seoul; University of Western Australia, Perth; and Purdue University, West Lafayette.
- Pursued parts of my doctoral research on Fractal intra-Urban Heat Islets in collaboration with the team through series of international workshops and meetings over the last 3 years.
 - UFZ, Magdeburg and TU Dresden, Germany* **Aug '16 & Aug '17**
 - Purdue University, IN, USA* **Feb '17**
 - University of Florida, Gainesville, FL, USA* **Feb '18**
 - Colorado State University, Fort Collins, CO, USA* **Aug '18**

World Urban Database and Portal Access Tool (WUDAPT) team

June '15 – June '16

- Worked as an instructor at Purdue University and Indian Institute of Technology, Bombay (IITB) teaching workflow of Local Climate Zones mapping - a random-forest based supervised classification for Urban Form and Function using Google Earth and SAGA GIS.
- Worked with Prof. Jason Ching and Prof. Gerald Mills who head the international community of WUDAPT to develop Local Climate Zone maps for Indian cities during my master's research.
- Studied the role of spatial heterogeneity in the correlation of remotely sensed Land Surface Temperature and Local Climate Zone (LCZ) that was presented at AMS 2017.
- Research findings were presented by Prof. Jason Ching at the 3rd WUDAPT workshop in Hong Kong (Dec '15) and published in *Bulletin of the American Meteorological Society*.

RELEVANT PROJECTS

Data-driven clustering of 100 cities based on spatial patterns of the Urban Heat Island Fall '18

- A data driven analysis of detecting similar spatial patterns of Urban Heat Island for 100 cities was conducted using a modified K-means clustering algorithm followed by Decision Tree classifier. A simple Neural Network classifier was also implemented to compare results.
- Classes of cities based on characteristics such as mono-centricity vs polycentricity, area, and diversity of Urban Land Use Land Cover classes were detected.

Mining geospatial twitter data to find popular coffeehouses and bars at Purdue Fall '16

- Geospatially tagged twitter data for the Purdue University campus was used to find the most popular locations of “Fuels that drive Purdue – Coffee and Beer”.
- Latent Dirichlet Allocation (LDA) was used to identify relevant tweets, and spatial Kernel density plots were evaluated to find the hotspots. Popular locations were found to be clustered together indicating the influence of Hotelling’s Law of market aggregation.

Network analysis of road network of Indianapolis Spring '16

- Road networks of Indianapolis were studied to compare the network characteristics of different network layout types.
- Network metrics such as Modularity, Assortativity, Node-degree-distribution, and Search Information were evaluated to delineate the difference between Commercial and Residential road networks.

Energy Efficiency analysis comparison for different city layouts Fall '15

- An energy efficiency analysis of an urban neighborhood for different urban layouts within fixed area and population was done using Simergy (software based on EnergyPlus).
- Energy consumption offsets by using Photo Voltaic rooftop solar panels were evaluated as well.
- Large Low-Rise building types displayed a distinct advantage over the other layouts in terms of energy usage owing to an optimal balance between the perimeter zone loads and core zone loads.

RELEVANT GRADUATE COURSES

Introduction to Complex Networks, Smart Cities Analytics (Machine Learning applications for Urban Systems), Complex Systems Engineering, Resilient Hybrid Infrastructure Networks, GIS, Geospatial Modeling and Analysis, Land Surface Modeling, and Environmental Informatics, Boundary Layer Meteorology, Urban Ecosystem Services.

TEACHING EXPERIENCE

Graduate Instructor, Purdue University Jan '16 – May '16

Worked as a mentor for an interdisciplinary graduate class on designing cities resilient to climate change. Responsibility: Teaching the workflow of Local Climate Zones mapping - a random-forest based supervised classification for Urban Form and Function using Google Earth and SAGA GIS.

Graduate Teaching Assistant, Purdue University Aug '14 – May '15

Courses taught: Principles and Practices of Geomatics, and Applied Statics

Responsibility: Demonstrations, field work, designing lab experiments, holding tutorial sessions and grading.

SKILLS

Programming: MATLAB, Python, R, Bash, JavaScript, LaTeX, HTML.

Remote Sensing & Geospatial Analysis: ArcGIS, SAGA GIS, R, Google Earth Engine.

Modeling: Weather Research Forecast (WRF) model.