

CURRICULUM VITAE

ZHIHUA WANG, PH.D.

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EDUCATION

- 2011 Ph.D., Civil and Environmental Engineering, Princeton University
- 2008 M.A., Civil and Environmental Engineering, Princeton University
- 2004 M.Eng, Civil and Environmental Engineering, Nanyang Technological University, Singapore
- 2002 B.Eng (1st Class Honors), Civil and Environmental Engineering, Nanyang Technological University, Singapore

ACADEMIC APPOINTMENT

- 2018.08 – present Associate Professor, School of Sustainable Engineering and the Built Environment, Arizona State University
- 2012.04 – present Co-director for Climate System Research, National Center of Excellence on SMART Innovations, Arizona State University
- 2012.01 – 2018.07 Assistant Professor, School of Sustainable Engineering and the Built Environment, Arizona State University
- 2011.09 – 2011.12 Post-doctorate Research Associate, Department of Civil and Environmental Engineering, Princeton University
- 2009.02 – 2010.06 Graduate Teaching Assistant, Princeton University
- 2004.04 – 2006.08 Research Project Officer, Nanyang Technological University, Singapore

AREAS OF EXPERTISE

Teaching

Fluid Mechanics for Civil Engineers; Environmental Fluid Mechanics; Hydrometeorology; Atmospheric Convection and Thermodynamics; Urban Water System Design

Research

My primary research interest focuses on the sustainable development of the built environment, including urban land-atmosphere interactions, heat mitigation strategies, environmental quality, and complex urban system modeling.

HONORS AND AWARDS

- Timothy Oke Award, International Association for Urban Climate, 2023
- Professor of Impact Award, Arizona State University, 2023
- Graduate Prize, Department of Civil and Environmental Engineering, Princeton University, 2006
- Dean's list of distinguished students, School of Civil and Environmental Engineering, Nanyang Technological University, 2001

PUBLICATIONS, INTELLECTUAL PROPERTY, AND PRESENTATIONS
SUMMARY OF PUBLICATION AND INTELLECTUAL PROPERTY

(*) Corresponding author

Total Peer-Reviewed Journal Publications: 106

Google Scholar Citation (as of 7/30/2023): 4350 h-index: 38

Journal Publications from ASU: 89

106. Wang Y., X. Yang, and **Z.H. Wang*** (2023), Causal mediation of urban temperature by geopotential height in U.S. cities, *Sustainable Cities and Society*, accepted.
105. Li, P., A. Sharma*, **Z.H. Wang**, and D. Wuebbles (2023), Assessing impacts of environmental perturbations on urban biogenic carbon exchange in the Chicago region, *Journal of Advances in Modeling Earth Systems*, in press. <https://doi.org/10.1029/2023MS003867>
104. Lipson, M.*, S. Grimmond, M. Best, ..., **Z.H. Wang** (2023), Evaluation of 30 urban land surface models in the Urban-PLUMBER project: Phase 1 results, *Quarterly Journal of the Royal Meteorological Society*, in press. <https://doi.org/10.1002/qj.4589>
103. Du, H., W. Zhan*, J. Voogt, B. Bechtel, T.C. Chakraborty, Z. Liu, L. Hu, **Z.H. Wang**, J. Li, P. Fu, W. Liao, M. Luo, L. Li, S. Wang, F. Huang, and S. Miao (2023), Contrasting trends and drivers of global surface and canopy urban heat islands, *Geophysical Research Letters*, 50, e2023GL104661. <https://doi.org/10.1029/2023GL104661>
102. Hou H., Q. Longyang, H. Su, R. Zeng, T. Xu, and **Z.H. Wang*** (2023), Prioritizing environmental determinants of urban heat islands: A machine learning study for major cities in China, *International Journal of Applied Earth Observation and Geoinformation*, 122, 103411. <https://doi.org/10.1016/j.jag.2023.103411>
101. Yang X., P. Li, and **Z.H. Wang*** (2023), The impact of urban irrigation on the temperature-carbon feedback in U.S. cities, *Journal of Environmental Management*, 344, 118452. <https://doi.org/10.1016/j.jenvman.2023.118452>
100. Li, L., W. Zhan*, L. Hu, T. Chakraborty, **Z.H. Wang**, P. Fu, D. Wang, W. Liao, F. Huang, H. Fu, J. Liu, Z. Liu, H. Du, and S. Wang (2023), Divergent urbanization-induced impacts on global surface urban heat island trends since 1980s, *Remote Sensing of Environment*, 295, 113650. <https://doi.org/10.1016/j.rse.2023.113650>
99. Li, P.*, Y. Yu, D. Huang, **Z.H. Wang**, and A. Sharma (2023), Regional heatwave prediction using Graph Neural Network and weather station data, *Geophysical Research Letters*, 51, e2023GL103405. <https://doi.org/10.1029/2023GL103405>
98. Hou, H., H. Su, C. Yao, and **Z.H. Wang*** (2023), Spatiotemporal patterns of the impact of surface roughness and morphology on urban heat island, *Sustainable Cities and Society*, 92, 104513. <https://doi.org/10.1016/j.scs.2023.104513>
97. Yang, X., **Z.H. Wang***, C. Wang, and Y.-C. Lai (2023), Finding causal gateways of precipitation over the contiguous United States, *Geophysical Research Letters*, 50, e2022GL101942. <https://doi.org/10.1029/2022GL101942>

96. Xiang, Y., Y. Tang, **Z.H. Wang**, C. Peng, C. Huang, Y. Dian, M. Teng, and Z. Zhou* (2023), Seasonal variations of the relationship between spectral indexes and land surface temperature based on local climate zones: A study in three Yangtze River megacities, *Remote Sensing*, 15, 870. <https://doi.org/10.3390/rs15040870>
95. Liu, Z., W. Zhan*, B. Bechtel, J. Voogt, J. Lai, T. Chakraborty, **Z.H. Wang**, M. Li, F. Huang, and X. Lee (2022), Surface warming in global cities is substantially more rapid than in rural background areas, *Communications Earth & Environment*, 3, 219. <https://doi.org/10.1038/s43247-022-00539-x>
94. Yang, X., **Z.H. Wang***, C. Wang, and Y.-C. Lai (2022), Detecting the causal influence of thermal environments among climate regions in the United States, *Journal of Environmental Management*, 322, 116001. <https://doi.org/10.1016/j.jenvman.2022.116001>
93. Yang, X., **Z.H. Wang***, and C. Wang (2022), Critical transition in the hydrological system: Early-warning signals and network analysis, *Hydrology and Earth System Sciences*, 26, 1845-1856. <https://doi.org/10.5194/hess-26-1845-2022>
92. Li, P., T. Xu, S. Wei, and **Z.H. Wang*** (2022), Multi-objective optimization of urban environmental system design using machine learning, *Computers, Environment and Urban Systems*, 94, 101796. <https://doi.org/10.1016/j.compenvurbsys.2022.101796>
91. **Wang, Z.H.*** (2022), Reconceptualizing urban heat island: Beyond the urban-rural dichotomy, *Sustainable Cities and Society*, 77, 103581. <https://doi.org/10.1016/j.scs.2021.103581>
90. **Wang, Z.H.*** (2021), Compound environmental impact of urban mitigation strategies: Co-benefits, trade-offs, and unintended consequence, *Sustainable Cities and Society*, 75, 103284. <https://doi.org/10.1016/j.scs.2021.103284>
89. Cui, Y., L. Hu, **Z.H. Wang**, and Q. Li*, (2021), Urban nocturnal cooling mediated by bluespace, *Theoretical and Applied Climatology*, 146, 277-292. <https://doi.org/10.1007/s00704-021-03727-5>
88. Li, H.*, Y. Li, T. Wang, **Z.H. Wang**, M. Gao, and H. Shen (2021), Quantifying 3D building form effects on urban land surface temperature and modeling seasonal correlation patterns, *Building and Environment*, 204, 108132. <https://doi.org/10.1016/j.buildenv.2021.108132>
87. **Wang, Z.H.***, C. Wang, and X. Yang (2021), Dynamic synchronization of extreme heat in complex climate networks in the contiguous United States, *Urban Climate*, 38, 100909. <https://doi.org/10.1016/j.uclim.2021.100909>
86. Li, P., and **Z.H. Wang*** (2021), Environmental co-benefit of urban greening for mitigating heat and carbon emissions, *Journal of Environmental Management*, 293, 112963. <https://doi.org/10.1016/j.jenvman.2021.112963>
85. Wang, C. *, **Z.H. Wang**, K.E. Kaloush, and J. Shacat (2021), Cool pavements for heat island mitigation: a synthetic review, *Renewable and Sustainable Energy Review*, 146, 111171. <https://doi.org/10.1016/j.rser.2021.111171>

84. Wang, Z., E.R. Vivoni*, T.J. Bohn, and **Z.H. Wang** (2021), A multiyear assessment of irrigation cooling capacity in agricultural and urban settings of central Arizona, *Journal of the American Water Resources Association*, 57(5), 771-788. <https://doi.org/10.1111/1752-1688.12920>
83. Wang, C.*, **Z.H. Wang**, and Y.H. Ryu (2021), A single-layer urban canopy model with transmissive radiation exchange between trees and street canyons, *Building and Environment*, 191, 107593. <https://doi.org/10.1016/j.buildenv.2021.107593>
82. Wang, C. *, **Z.H. Wang**, K.E. Kaloush, and J. Shacat (2021), Perceptions of urban heat island mitigation and implementation strategies: survey and gap analysis, *Sustainable Cities and Society*, 66, 102687. <https://doi.org/10.1016/j.scs.2020.102687>
81. Li, P., and **Z.H. Wang*** (2021), Uncertainty and sensitivity analysis of modeling plants CO2 exchange in the built environment, *Building and Environment*, 189, 107539. <https://doi.org/10.1016/j.buildenv.2020.107539>
80. Zhang, F., C. Wang, and **Z.H. Wang*** (2020), Responses of natural vegetation to climate in dryland ecosystems: A comparative study between Xinjiang and Arizona, *Remote Sensing*, 12, 3567. <https://doi.org/10.3390/rs12213567>
79. Wang, C., **Z.H. Wang***, and Q. Li (2020), Emergence of urban clustering among U.S. cities under environmental stressors, *Sustainable Cities and Society*, 63, 102481. <https://doi.org/10.1016/j.scs.2020.102481>
78. Li, P., and **Z.H. Wang*** (2020), Modeling carbon dioxide exchange in a single-layer urban canopy model, *Building and Environment*, 184, 107243. <https://doi.org/10.1016/j.buildenv.2020.107243>
77. Huang, F., W. Zhan*, **Z.H. Wang**, J. Voogt, L. Hu, J. Quan, C. Liu, N. Zhang, and J. Lai (2020), Satellite identification of atmosphere-surface-subsurface urban heat islands under clear sky, *Remote Sensing of Environment*, 250, 112039. <https://doi.org/10.1016/j.rse.2020.112039>
76. Wang, C., **Z.H. Wang***, and L. Sun (2020), Early warning signals for critical temperature transition, *Geophysical Research Letters*, 47, e2020GL088503. <https://doi.org/10.1029/2020GL088503>
75. **Wang, Z.H.*** (2020), Can trees pollute cities? *Atmosfera*, 1-11. <https://doi.org/10.20937/ATM.52907>
74. Wang, C., and **Z.H. Wang*** (2020), A network-based toolkit for evaluation and intercomparison of weather prediction and climate modeling, *Journal of Environmental Management*, 268, 110709. <https://doi.org/10.1016/j.jenvman.2020.110709>
73. Li, P., and **Z.H. Wang*** (2020), A nonequilibrium thermodynamic approach for surface energy balance closure, *Geophysical Research Letters*, 47(3), e2019GL085835. <https://doi.org/10.1029/2019GL085835>
72. Yang, J. *, **Z.H. Wang**, and H.P. Huang (2019), Intercomparison of the surface energy partitioning in CMIP5 simulations, *Atmosphere*, 10(10), 602.

<https://doi.org/10.3390/atmos10100602>

71. Wang, C., **Z.H. Wang***, and J. Yang (2019), Urban water capacity: Irrigation for heat mitigation, *Computers, Environment and Urban Systems*, 78, 101397. <https://doi.org/10.1016/j.compenvurbsys.2019.101397>
70. **Wang, Z.H.***, R. von Gnechten, D. Sampson, and D.D. White (2019), Wastewater reclamation holds a key for water sustainability in future urban development of Phoenix Metropolitan Area, *Sustainability*, 11, 3537. <https://doi.org/10.3390/su11133537>
69. Li, P., and **Z.H. Wang*** (2019), Estimating evapotranspiration over vegetated surfaces based on wet patch patterns, *Hydrology Research*, 50(4), 1037-1046. <https://doi.org/10.2166/nh.2019.034>
68. Wang, C., **Z.H. Wang***, C. Wang, and S.W. Myint (2019), Environmental cooling provided by urban trees under extreme heat and cold waves, *Remote Sensing of Environment*, 227, 28-43. <https://doi.org/10.1016/j.rse.2019.03.024>
67. **Wang, Z.H.***, and R. Upreti (2019), A scenario analysis of thermal environmental changes induced by urban growth in Colorado River Basin, USA, *Landscape and Urban Planning*, 181, 125-138. <https://doi.org/10.1016/j.landurbplan.2018.10.002>
66. Wang, C., Q. Li, and **Z.H. Wang*** (2018), Quantifying the impact of urban trees on passive pollutant dispersion using a coupled large-eddy simulation-Lagrangian stochastic model, *Building and Environment*, 145, 33-49. <https://doi.org/10.1016/j.buildenv.2018.09.014>
65. Wang, C., **Z.H. Wang***, and J. Yang (2018), Cooling effect of urban trees on the built environment of contiguous United States, *Earth's Future*, 6, 1066-1081. <https://doi.org/10.1029/2018EF000891>
64. Song, J.* , **Z.H. Wang**, and C. Wang (2018), The regional impact of urban heat mitigation strategies on planetary boundary-layer dynamics over a semi-arid city, *Journal of Geophysical Research: Atmospheres*, 123, 6410-6422. <https://doi.org/10.1029/2018JD028302>
63. Omidvar, H., J. Song, J. Yang, G. Arwatz, **Z.H. Wang**, M. Hulme, K. Kaloush, and E. Bou-Zeid* (2018), Rapid modification of urban land surface temperature during rainfall, *Water Resources Research*, 54, 4245-4264. <https://doi.org/10.1029/2017WR022241>
62. Wang, C., **Z.H. Wang***, J. Yang, and Q. Li (2018), A backward-Lagrangian-stochastic footprint model for the urban environment, *Boundary-Layer Meteorology*, 168(1), 59-80. <https://doi.org/10.1007/s10546-018-0338-6>
61. Li, Q.* , and **Z.H. Wang** (2018), Large-eddy simulation of the impact of urban trees on momentum and heat fluxes, *Agricultural and Forest Meteorology*, 255, 44-56. <https://doi.org/10.1016/j.agrformet.2017>
60. Templeton, N.A., E.R. Vivoni*, **Z.H. Wang**, and A. Schreiner-McGraw (2018), Quantifying water and energy fluxes over different urban land covers in Phoenix, Arizona, *Journal of Geophysical Research-Atmospheres*, 123(4), 2111–2128. <https://doi.org/10.1002/2017JD27845>

59. Zhao, Q.* , J. Yang, **Z.H. Wang**, and E.A. Wentz (2018), Assessing the cooling and locational benefits of tree shade by an outdoor urban physical scale model at Tempe, AZ, *Urban Science*, 2, 20. <https://doi.org/10.3390/urbansci2010004>
58. Huang, F., W. Zhan*, **Z.H. Wang**, K. Wang, J.M. Chen, Y. Liu, J. Lai, and W. Ju (2017), Positive or negative? Urbanization-induced variations in diurnal skin-surface temperature range detected using satellite data, *Journal of Geophysical Research: Atmospheres*, 122(24), 13229-13244. <https://doi.org/10.1002/2017JD027021>
57. Wang, C.* , C. Wang, S.W. Myint, and **Z.H. Wang** (2017), Landscape determinants of spatio-temporal patterns of aerosol optical depth in the two most polluted metropolitans in the United States, *Science of the Total Environment*, 609, 1556-1565. <https://doi.org/10.1016/j.scitotenv.2017.07.273>
56. Yang, J., and **Z.H. Wang*** (2017), Planning for a sustainable desert city: The potential water buffering capacity of urban green infrastructure, *Landscape and Urban Planning*, 167, 339-347. <https://doi.org/10.1016/j.landurbplan.2017.07.014>
55. Song, J., **Z.H. Wang***, S.W. Myint, and C. Wang (2017), The hysteresis effect on surface-air temperature relationship and its implications to urban planning: An examination in Phoenix, Arizona, USA, *Landscape and Urban Planning*, 167, 198-211. <https://doi.org/10.1016/j.landurbplan.2017.06.024>
54. Sun, T.* , **Z.H. Wang**, W. Oechel, and C.S.B. Grimmond (2017), The analytical objective hysteresis model (AnOHM v1.0): Methodology to determine bulk storage heat flux coefficients, *Geoscientific Model Development*, 10, 2875-2890. <https://doi.org/doi:10.5194/gmd-10-2875-2017>
53. Upreti, R., **Z.H. Wang***, and J. Yang (2017), Radiative shading effect of urban trees on cooling the regional built environment, *Urban Forestry & Urban Greening*, 26, 18-24. <https://doi.org/10.1016/j.ufug.2017.05.008>
52. Wang, C., and **Z.H. Wang*** (2017), Projecting population growth as a dynamic measure of regional urban warming, *Sustainable Cities and Society*, 32, 357-365. <https://doi.org/10.1016/j.scs.2017.04.010>
51. **Wang, Z.H.***, and Q. Li (2017), Thermodynamic characterisation of urban nocturnal cooling, *Heliyon*, 3, e00290. <https://doi.org/10.1016/j.heliyon.2017.e00290>
50. Song, J.* , **Z.H. Wang**, and C. Wang (2017), Biospheric and anthropogenic contributors to atmospheric CO₂ variability in a residential neighborhood of Phoenix, Arizona, *Journal of Geophysical Research: Atmospheres*, 122, 3317-3329. <https://doi.org/doi:10.1002/2016JD026267>
49. Aflaki, A.* , M. Mirnezhad, A. Ghaffarianhoseini, A.G. Ghaffarianhoseini, H. Omrany, **Z.H. Wang**, and H. Akbari (2017), Urban heat island mitigation strategies: A state-of-the-art review on Kuala Lumpur, Singapore and Hong Kong, *Cities*, 62, 131-145. <https://doi.org/doi:10.1016/j.cities.2016.09.003>
48. Yang, J., **Z.H. Wang***, Q. Li, N. Vercauteren, E. Bou-Zeid, and M.B. Parlange (2017), A

- novel approach for unraveling the energy balance of water surfaces with a single depth temperature measurement, *Limnology and Oceanography*, 62, 89-103.
<https://doi.org/10.1002/lno.10378>
47. Song, J., and **Z.H. Wang*** (2016), Diurnal changes in urban boundary layer environment induced by urban greening, *Environmental Research Letters*, 11, 114018.
<https://doi.org/10.1088/1748-9326/11/11/114018>
 46. **Wang, Z.H.***, C. Fan, S.W. Myint, and C. Wang (2016), Size matters: what are the characteristic source areas for urban planning strategies?, *PLoS One*, 11(11), e0165726.
<https://doi.org/10.1371/journal.pone.0165726>
 45. Wang, C.* , J. Yang, S.W. Myint, **Z.H. Wang**, and B. Tong (2016), Empirical modelling and spatio-temporal patterns of urban evapotranspiration for the Phoenix Metropolitan area, Arizona, *GIScience & Remote Sensing*, 53(6), 778-792.
<https://doi.org/10.1080/15481603.2016.1243399>
 44. Yang, J.* , **Z.H. Wang**, K. Kaloush, and H. Dylla (2016), Effect of pavement thermal properties on mitigating urban heat islands: A multi-scale modeling case study in Phoenix, *Building and Environment*, 108, 110-121. <https://doi.org/10.1016/j.buildenv.2016.08.021>
 43. Huang, F., W. Zhan*, J. Voogt, L. Hu, **Z.H. Wang**, J. Quan, W. Ju, and Z. Guo (2016), Temporal upscaling of surface urban heat island by incorporating an annual temperature cycle model: A tale of two cities, *Remote Sensing of Environment*, 186, 1-12.
<https://doi.org/10.1016/j.rse.2016.08.009>
 42. Song, J., and **Z.H. Wang*** (2016), Evaluating the impact of built environment characteristics on urban boundary layer dynamics using an advanced stochastic approach, *Atmospheric Chemistry and Physics*, 16, 6285-6301. <https://doi.org/10.5194/acp-16-1-2016>
 41. Yang, J., **Z.H. Wang***, M. Georgescu, F. Chen, and M. Tewari (2016), Assessing the impact of enhanced hydrological processes on urban hydrometeorology with application to two cities in contrasting climates, *Journal of Hydrometeorology*, 17, 1031-1047.
<https://doi.org/10.1175/JHM-D-15-0112.1>
 40. Wang, C.* , S. Myint, **Z.H. Wang**, and J. Song (2016), Spatio-temporal modeling of the urban heat island in the Phoenix Metropolitan area: Land use change implications, *Remote Sensing*, 8, 185. <https://doi.org/10.3390/rs8030185>
 39. Ryu, Y.H.* , E. Bou-Zeid, **Z.H. Wang**, and J.A. Smith (2016), Realistic representation of urban trees in an urban canopy model, *Boundary-Layer Meteorology*, 159, 193-220.
<https://doi.org/10.1007/s10546-015-0120-y>
 38. Song, J.* , J. Xia, L. Zhang, **Z.H. Wang**, H. Wan, and D. She (2016), Streamflow prediction in ungauged basins by regressive regionalization: A case study in Huai River Basin, China, *Hydrology Research*, 47(5), 1053-1068. <https://doi.org/10.2166/nh.2015.155>
 37. **Wang, Z.H.***, X. Zhao, J. Yang, and J. Song (2016), Cooling and energy saving potentials of shade trees and urban lawns in a desert city, *Applied Energy*, 161(3), 437-444.
<https://doi.org/10.1016/j.apenergy.2015.10.047>

36. Song, J., and **Z.H. Wang*** (2015), Impacts of mesic and xeric urban vegetation on outdoor thermal comfort and microclimate in Phoenix, AZ, *Building and Environment*, 94(2), 558-568. <https://doi.org/10.1016/j.buildenv.2015.10.016>
35. Yang, J., and **Z.H. Wang*** (2015), Optimizing urban irrigation schemes for the trade-off between energy and water consumption, *Energy and Buildings*, 107, 335-344. <https://doi.org/10.1016/j.enbuild.2015.08.045>
34. Georgescu, M.*, W.T. Chow, **Z.H. Wang**, A. Brazel, B. Trapido-Lurie, M. Roth, and V. Benson-Lira (2015), Prioritizing urban sustainability solutions: coordinated approaches must incorporate scale-dependent built environment induced effects, *Environmental Research Letters*, 10, 061001. <https://doi.org/10.1088/1748-9326/10/6/061001>
33. Yang, J., **Z.H. Wang***, and K.E. Kaloush (2015), Environmental impacts of reflective materials: Is high albedo a 'silver bullet' for mitigating urban heat island? *Renewable and Sustainable Energy Reviews*, 47, 830-843. <https://doi.org/10.1010/j.rser.2015.03.092>. (IF: 16.799)
32. Yang, J., **Z.H. Wang***, F. Chen, S. Miao, M. Tewari, J. Voogt, and S. Myint (2015), Enhancing hydrologic modeling in the coupled Weather Research and Forecasting - urban modeling system, *Boundary-Layer Meteorology*, 155(1), 87-109. <https://doi.org/10.1007/s10546-014-9991-6>
31. Song, J., and **Z.H. Wang*** (2015), Interfacing urban land-atmosphere through coupled urban canopy and atmospheric models, *Boundary-Layer Meteorology*, 154(3), 427-448. <https://doi.org/10.1007/s10546-014-9980-9>
30. Yang, J., and **Z.H. Wang*** (2014), Land surface energy partitioning revisited: A novel approach based on single depth soil measurement, *Geophysical Research Letters*, 41, 8348-8358. <https://doi.org/10.1002/2014GL062041>
29. **Wang, Z.H.*** (2014), Monte Carlo simulations of radiative heat exchange in a street canyon with trees, *Solar Energy*, 110, 704-713. <https://doi.org/10.1016/j.solener.2014.10.012>
28. **Wang, Z.H.*** (2014), A new perspective of urban-rural differences: The impact of soil water advection, *Urban Climate*, 10, 19-34. <https://doi.org/10.1016/j.clim.2014.08.004>
27. Huang, F., W. Zhan*, W. Ju, and **Z.H. Wang** (2014), Improved reconstruction of soil thermal field using two-depth measurements of soil temperatures, *Journal of Hydrology*, 519, 711-719. <https://doi.org/10.1016/j.jhydrol.2014.08.014>
26. Yang, J., and **Z.H. Wang*** (2014), Physical parameterization and sensitivity of urban hydrological models: Application to green roof systems, *Building and Environment*, 75, 250-263. <https://doi.org/10.1016/j.buildenv.2014.02.006>
25. Ramamurthy, P.*, E. Bou-Zeid, J. Smith, **Z.H. Wang**, M. Baeck, J. Hom, and C. Welty (2014), Influence of sub-facet heterogeneity and material properties on the urban surface energy budget, *Journal of Applied Meteorology and Climatology*, 53(9), 2114-2129. <https://doi.org/10.1175/JAMC-D-13-0286.1>
24. Shan, W.*, T. Lu, **Z.H. Wang**, and C. Majidi (2013), Thermal analysis and design of a multi-

- layered rigidity tunable composite, *International Journal of Heat and Mass Transfer*, 66, 271-278. <https://doi.org/10.1016/j.ijheatmasstransfer.2013.07.031>
23. Yang, J., **Z.H. Wang***, and T.W. Lee (2013), Relative efficiency of surface energy partitioning over different land covers, *British Journal of Environment and Climate Change*, 3(1), 86-102.
 22. Sun, T., **Z.H. Wang***, and G. Ni (2013), Revisiting the hysteresis effect in surface energy budgets, *Geophysical Research Letters*, 40, 1741-1747. <https://doi.org/10.1002/grl.50385>
 21. Sun, T.*, E. Bou-Zeid, **Z.H. Wang**, E. Zerba, and G.H. Ni (2013), Hydrological determinants of green roof performance via a vertically-resolved model for heat and water transport, *Building and Environment*, 60, 211-224. <https://doi.org/10.1016/j.buildenv.2012.10.018>
 20. **Wang, Z.H.***, E. Bou-Zeid, and J.A. Smith (2013), A coupled energy transport and hydrological model for urban canopies evaluated using a wireless sensor network, *Quarterly Journal of the Royal Meteorological Society*, 139(675), 1643-1657. <https://doi.org/10.1002/qj.2032>
 19. Lee, T.-W.*, J.Y. Lee, and **Z.H. Wang** (2012), Scaling of the urban heat island intensity using time-dependent energy balance, *Urban Climate*, 2, 16-24. <https://doi.org/10.1016/j.uclim.2012.10.005>
 18. **Wang, Z.H.*** (2012), Reconstruction of soil thermal field from a single depth measurement, *Journal of Hydrology*, 464-465, 541-549. <https://doi.org/10.1016/j.jhydrol.2012.07.047>

Journal Publications Prior to ASU: 17

17. **Wang, Z.H.***, and E. Bou-Zeid (2012), A novel approach for the estimation of soil ground heat flux, *Agricultural and Forest Meteorology*, 154-155, 214-221. <https://doi.org/10.1016/j.agrformet.2011.12.001>
16. **Wang, Z.H.***, E. Bou-Zeid, S.K. Au, and J.A. Smith (2011), Analyzing the sensitivity of WRF's single-layer urban canopy model to parameter uncertainty using advanced Monte Carlo simulation, *Journal of Applied Meteorology and Climatology*, 50(9), 1795-1814. <https://doi.org/10.1175/2011jamc2685.1>
15. **Wang, Z.H.***, and E. Bou-Zeid (2011), Comment on "Impact of wave phase difference between soil surface heat flux and soil surface temperature on soil surface energy balance closure" by Z. Gao, R. Horton, and H. P. Liu, *Journal of Geophysical Research - Atmospheres*, 116, D08110. <https://doi.org/10.1029/2010jd015117>
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Manuscripts Submitted/under Review: 7

1. Hashemi, S.*, A. Ghaffarianhoseini, A. Ghaffarianhoseini, N. Naismith, and **Z.H. Wang** (2023), A classification of key criteria for selection of microclimatic case study locations for analyzing outdoor thermal comfort – a systematic review, *Urban Climate*, under review.
2. Yang, X., **Z.H. Wang***, Q. Li, and Y.-C. Lai (2023), Time variability and periodicity of cross-regional hydroclimatic causation in the U.S., *Quarterly Journal of the Royal Meteorological Society*, under review.
3. Li, P., **Z.H. Wang***, and C. Wang (2023), Can urban irrigation counteract climate-carbon feedback? *Nature Communications*, under review.
4. Wang, S., W. Zhan*, T.C. Chakraborty, Y. Ju, B. Zhou, **Z.H. Wang**, et al (2023), Largely underestimated future simmering for global urban population, *PNAS*, submitted.
5. Yang X., **Z.H. Wang***, C. Wang, and Y.C. Lai (2023), Megacities are causal pacemakers for extreme heatwaves in the U.S. submitted.
6. Li, H.*, Y. Han, T. **Wang**, **Z.H. Wang**, Y. Li, H. Shen (2023), Evolution of urban morphological polycentricity and the thermal response in Wuhan from 2000 to 2020, *Sustainable Cities and Society*, submitted.
7. **Wang, Z.H.***, P. Li, and C. Wang (2023) Impact of urban trees on carbon dioxide exchange: Mechanistic pathways, environmental controls, and feedback, *Sustainable Cities and Society*, submitted.

Manuscripts under Preparation: 5

8. Yang X., **Z.H. Wang***, and Y.C. Lai (2023), Predicting extreme urban heatwaves using reservoir computing, under preparation.
9. Hou H., Q. Longyang, H. Su, R. Zeng, T. Xu, and **Z.H. Wang*** (2023), A machine learning study of the attribution of urban warming to land surface characteristics in U.S. cities, under preparation.
10. Wang, S., W. Zhan*, et al. (2023), Urban heat island-provoked mortality reduction offset and even surpass its induced life losses, under preparation.
11. Fan, S., H. Hou, Q. Longyang, and **Z.H. Wang*** (2023), Landscape determinants of urban warming in Phoenix Metropolitan area by machine learning, under preparation.
12. **Wang, Z.H.*** (2023), Diminishing marginal utility of urban greening implies social equity, under preparation.

Book Chapters: 1

1. Tewari, M., **Z.H. Wang**, D. Chen, Q-V Doan, H. Kusaka, P. Ramamurthy and P. Ray (2022), Chapter 1.3: Extreme weather forecasting in urban areas, In: *Extreme Weather Forecasting* (edited by M. Astitha & E. Nikolopoulos), pp. 14-31. Elsevier, ISBN: 978-0-12-820124-4

Technical Reports: 7

1. Wang C, **Wang ZH**, and Kaloush (2020), Critical review and gap analysis of impacts from pavements on urban heat island. Final project report prepared for National Asphalt Pavement Association (NAPA).
2. **Wang ZH**, Kaloush KE and Wang C (2017), *Sustainability and scaling of urban transportation network*. Report for National Transportation Center, 33 pp.
3. Kaloush KE, **Wang ZH**, and Yang J (2015), *Examining the use of reflective pavements to mitigate urban heat island effect*. Asphalt Pavement Magazine, vol. 33, p. 44-47.
4. Yang J, **Wang ZH**, and Kaloush K (2015), *Effect of Pavement Properties on Building Energy Efficiency*. Final project report prepared for National Asphalt Pavement Association (NAPA).
5. Yang J, **Wang ZH**, and Kaloush K (2013), *Unintended Consequence: A Research Synthesis Examining the Use of Reflective Pavements to Mitigate the Urban Heat Island Effect*. 17 pp. National Center of Excellence on SMART Innovations, Arizona State University.
6. Kaloush KE, **Wang ZH**, Pourshams-Manzouri T, and Stempihar JJ (2013), *Asphalt Pavement Temperature Effects on Overall Urban Heat Island, Phase II Report*, prepared for National Asphalt Pavement Association (NAPA).
7. **Wang ZH**, 2004, *FEMHT – Finite Element Modelling for Heat Transfer: Theoretical and User’s manuals*, Building and Construction Authority (BCA) project report, Singapore.

Refereed Conference Publications: 6

1. Li P, **Wang ZH** (2020), Modeling biogenic and anthropogenic carbon dioxide exchange in urban area – a data fusion approach. In: Proceedings of the 54th International Conference of the Architectural Science Association (ANZAScA) [Editors, A. Ghaffarianhoseini, A. Ghaffarianhoseini, N. Naismith], Auckland, New Zealand, pp. 755-764.
2. Scherer GW, Prévost JH, **Wang ZH** (2009), Finite element analysis of the bending of a saturated beam. In: *Poromechanics IV, Proc. Fourth Biot Conf. on Poromechanics*, Eds. H.I. Ling, A. Smyth, R. Betti (DEStech Publications, Lancaster, PA, 2009), New York, USA, pp. 890-895,
3. Wong MB, Tan KH, **Wang ZH** (2006), Effect of temperature prediction methods on fire resistance of steel members. *Proceedings of the 19th Australasian Conference on the*

Mechanics of Structures and Materials (ACMSM), Christchurch, New Zealand.

4. **Wang ZH**, Tan KH (2006), Time delay coefficient of temperature formulations in EC3 Part 1-2 and classification of fire protection materials. *Proceedings of 4th international workshop of Structures in Fire*, Aveiro, Portugal, pp.3-11.
5. Tan KH, **Wang ZH**, Au SK (2004), Heat transfer analysis for steel work insulated by intumescent paint exposed to standard fire conditions. *Proceedings of 3rd international workshop of Structures in Fire*, Ottawa, Canada, pp. 49-58.
6. **Wang ZH**, Zhao J (2000) Numerical modeling of stress development in rock under dynamic loading. *Proceedings of 6th National Undergraduate Research Opportunity Programme (NUROP) Congress*, National University of Singapore, Singapore.

SUMMARY OF PRESENTATION

(~) Presenting author

Invited Presentations – External: 14

1. Wang, Z.H., “Complex urban climate system modeling”. In: *NSF Urban Climate Solution Workshop*, Texas A&M University, Bryan, TX, 8 October 2023.
2. Wang, Z.H., “Urban climate modeling: from complex processes to complex systems”. University of Notre Dame, Notre Dame, IN, 30 November 2021.
3. Wang, Z.H., “Toward more livable cities in the future: heat mitigation, predictions, and system dynamics”. IBM Environmental Seminar, 01 July 2021.
4. Wang, Z.H., Wang, C., Kaloush, K.E., “Impact of pavements on urban heat island: A critical review and gap analysis”. NAPA online webinar, 15 October 2020.
5. Wang, Z.H., “Trade-off of energy and water for sustainable urban development”. University of Arizona, Tuscan, 23 January 2020.
6. Wang, Z.H., “Urban green infrastructure in an arid city: cooling, irrigation, and heat-water trade-off”. *NSF Workshop of Networking for Environmental Sustainability in Arid Region Urban Communities*. Texas Tech University, 14-16 August 2019.
7. Wang, Z.H., “The role of green infrastructure in sustainable urban development: Modeling & implications”. University of California, Irvine, 13 November 2017.
8. Wang, Z.H., “Climate-energy-water repercussions of urban green infrastructure”. Nanjing University, Nanjing, China, 13 June 2016.
9. Wang, Z.H., “Urban green infrastructure: Modeling and Implications to sustainable development of cities”. Nanyang Technological University, Singapore, 02 June 2016.
10. Wang, Z.H., “Urban sustainability research under the changing climate”. Southwest University of Science and Technology, Mianyang, China, 23 May 2013.

11. Wang, Z.H., "The role of water in land surface energy balance: an analytical perspective". Tsinghua University, Beijing, China, 15 May 2013.
12. Wang, Z.H., "Field measurements and numerical modeling of energy transport in urban areas". University of Southern California, Los Angeles, 30 March 2011.
13. Wang, Z.H., "Transport of surface energetics from urban areas: field measurements and numerical modeling". Institute of Atmospheric Physics, Chinese Academy of Science, Beijing, 25 Feb 2011.
14. Wang, Z.H., "A Sensor Network Over Princeton – application to the study of urban micrometeorology". Mid-InfraRed Technologies for Health and Environment (MIRTHE) Monthly Lecture Series, Princeton, 09 Dec 2010.

Invited Presentations – ASU Internal: 7

1. Wang, Z.H., "Thermodynamic liquid-water-vapor equilibrium: Applications to some environmental problems". SEBE Environmental Engineering Seminar, Arizona State University, Tempe, 30 October 2018.
2. Wang, Z.H., "Energy-water trade-off of urban irrigation: How much water does it take to cool Phoenix". Joint ASU Global Drylands Center and SEBE Hydrosystems Seminar, Tempe, 29 November 2017.
3. Wang, Z.H., "Size matters: footprint modeling in the built environment and its implications to urban planning strategies". SEMTE Environmental Fluid Dynamics Seminar, Tempe, 15 November 2016.
4. Wang, Z.H., "Urban land-atmosphere interactions: Implications to sustainable city development". SEBE Environmental Engineering Seminar Series, Arizona State University, Tempe, 18 November 2014.
5. Wang, Z.H., "Sustainable cities under future climate challenges: Measurement, modeling, and adaptation". SEBE external advisory board meeting, Tempe, 21 February 2013.
6. Wang, Z.H., "Transport of heat and water in canopy layers". SEBE Environmental Engineering Seminar Series, Arizona State University, Tempe, 17 January 2012.
7. Wang, Z.H., "Surface exchange scheme coupling energy and water transport in urban canopies". Arizona State University, Tempe, 21 April 2011.

Conference Presentations: 96

1. Wang C~, Yang X, Wang ZH. Modeling urban climates as complex dynamic systems. In: 11th International Conference on Urban Climate (ICUC11), Sydney, 28 August – 1 September, 2023.
2. Lipson M~, Grimmond S, Best M, ... Wang ZH. The Urban-PLUMBER land surface model evaluation project; Phase 1 results. In: 11th International Conference on Urban Climate

- (ICUC11), Sydney, 28 August – 1 September, 2023.
3. Hou H~, Wang ZH. Spatiotemporal patterns of the impact of surface roughness and morphology on urban heat island. In: the 2023 Urban Climate Research Center Annual Poster Competition, Tempe AZ, 20 April 2023.
 4. Yang X~, Wang ZH. Time evolution of cross-regional hydroclimatic causation in the U.S. In: *103rd AMS Annual Meeting*, Denver CO, 8-12 January 2023.
 5. Yang X~, Wang ZH, Wang C. Causal propagation of extreme heatwaves in the urban USA. In: *103rd AMS Annual Meeting*, Denver CO, 8-12 January 2023.
 6. Yang X~, Wang ZH. Quantifying variability and periodicity of cross-regional climatic causation in the U.S. In: *2022 AGU Fall Meeting*, Chicago IL, 12-16 December 2022.
 7. Wang C~, Wang ZH, Ryu Y. A single-layer urban canopy model with transmissive radiation exchange between trees and street canyons. In: *2022 AGU Fall Meeting*, Chicago IL, 12-16 December 2022.
 8. Hou H~, Wang ZH, Su H. Investigate the spatiotemporal impacts of urban morphology on land surface temperature. In: *2022 AGU Fall Meeting*, Chicago IL, 12-16 December 2022.
 9. Yang X~, Wang ZH, Wang C. Finding causal gateways of heatwave propagation among U.S. cities. In: *2022 AGU Fall Meeting*, Chicago IL, 12-16 December 2022.
 10. Li P~, Yu Y, Huang D, Wang ZH, Sharma A. Predicting regional heatwaves using Interpretable Graph Neural Networks. In: *2022 AGU Fall Meeting*, Chicago IL, 12-16 December 2022.
 11. Yang X~, Wang ZH, Wang C. Causal analysis of spatial patterns of urban heatwaves among U.S. cities. In: *International Association for Urban Climate (IAUC) virtual poster conference*, Aug 30 – Sept 1, 2022.
 12. Yang X~, Wang ZH. Finding regional atmospheric mediators in the U.S. using causality inference. In: *12nd SEBE Annual Graduate Research Symposium*, Tempe, February 11, 2022.
 13. Yang X~, Wang ZH, Wang C. Detecting critical transitions in urban hydrological system in the contiguous United States. In: *102nd Annual Meeting of American Meteorological Society*, Houston, TX, 23-27 January 2022.
 14. Wang ZH~, Wang C, Yang X. Simulating heat extremes using dynamic synchronization in complex climate networks. In: *2021 AGU Fall Meeting*, New Orleans, LA, 13-17 December 2021.
 15. Yang X~, Wang ZH, Wang C. Data-driven prediction of urban hydrological transitions in the Contiguous United States. In: *2021 AGU Fall Meeting*, New Orleans, LA, 13-17 December 2021.
 16. Li P~, Xu T, Wei S, Wang ZH. Assessment and multi-objective optimization of urban environmental system design using a machine learning approach. In: *2021 AGU Fall*

- Meeting*, New Orleans, LA, 13-17 December 2021.
17. Li P~, Wang ZH, Wang C. Estimating the impact of urban irrigation on carbon dioxide exchange using a coupled WRF-UCM and photosynthesis model. In: *2021 AGU Fall Meeting*, New Orleans, LA, 13-17 December 2021.
 18. Yang X~, Wang ZH. Detecting phase shift in the hydrological system. In *11th SEBE Annual Graduate Research Symposium*, Tempe, 19 February, 2021.
 19. Li P~, Wang ZH. Environmental co-benefits from urban greening for mitigating heat and carbon emissions. In: *11th SEBE Annual Graduate Research Symposium*, Tempe, 19 February, 2021.
 20. Sun L~, Wang C, Wang ZH. Climatology of solar radiation in the Contiguous United States (CONUS) (1960-2019). In: *101st Annual Meeting of American Meteorological Society*, Virtual, 10-15 January, 2021.
 21. Li P~, Wang ZH. Modeling and sensitivity analysis of carbon dioxide exchange in urban environment. In: *101st Annual Meeting of American Meteorological Society*, Virtual, 10-15 January, 2021.
 22. Sun L~, Wang C, Wang ZH. Long-term solar radiation patterns across the Contiguous United States. In: *2020 American Geophysical Society Fall Meeting*, Virtual, December 7-11, 2020.
 23. Li P~, Wang ZH. Carbon dioxide exchange in urban areas: modeling, uncertainties and sensitivity analysis. In: *2020 American Geophysical Society Fall Meeting*, Virtual, December 7-11, 2020.
 24. Wang Z~, Vivoni ER, Bohn TJ, Wang ZH. Irrigation Cooling Capacity in Agricultural and Urban Settings of Central Arizona: A Multiyear Assessment. In: *2020 American Geophysical Society Fall Meeting*, Virtual, December 7-11, 2020.
 25. Li P~, Wang ZH. Modeling carbon dioxide exchange in a single-layer urban canopy model. In: *The 54th International Conference of the Architectural Science Association (ANZAScA) 2020*, Auckland, New Zealand, November 25-28, 2020.
 26. Wang C~, Li Q, Wang ZH. The residence time of pollutants emitted within the urban canopy influenced by street canyon geometry and emission conditions. In: *100th Annual Meeting of American Meteorological Society*, Boston, MA, January 13-17, 2020.
 27. Wang C~, Wang ZH, Yang J. Evaluating the potential of irrigation for mitigating urban heat: Trade-off between water use and heat mitigation capacity. In: *2019 American Geophysical Society Fall Meeting*, San Francisco, CA, December 9-13, 2019.
 28. Yang J~, Wang ZH. Cooling an arid city: the energy-water trade-off of urban irrigation. In: *AOGS 16th Annual Meeting*, Singapore, July 28-August 2, 2019.
 29. Wang C~, Wang ZH, Wang C, Myint SW. The cooling capacity of urban trees in response to thermal extremes in U.S. cities, In: *2019 Urban Climate Research Center Poster Symposium*, Tempe, March 27, 2019.

30. Li P~, Wang ZH. Live in a steam engine - Surface energy imbalance revisited in the light of non-equilibrium thermodynamics. In: In: 2019 SEBE Graduate Poster Symposium, Tempe, February 22, 2019.
31. Wang C~, Wang ZH. Structure of similarity-driven clustering among U.S. cities in response to environmental stressors, In: 2019 SEBE Graduate Poster Symposium, Tempe, February 22, 2019.
32. Wang C~, Wang ZH. A statistical view of the Phoenix urban heat island during the past 86 Years (1933–2018), In: 2019 CAP LTER All Scientist Meeting, Tempe, January 11, 2019.
33. Wang ZH~, Li P. Surface energy imbalance revisited in the light of nonequilibrium thermodynamics. In: *99th Annual Meeting of American Meteorological Society*, Phoenix, AZ, January -6-10, 2019.
34. Wang C~, Wang ZH. Temperature regulation of the surface cooling rate of urban trees under climatic extremes. In: *99th Annual Meeting of American Meteorological Society*, Phoenix, AZ, January -6-10, 2019.
35. Li P~, Wang ZH. A novel approach to estimate actual evapotranspiration using soil moisture and meteorological measurements. In: *99th Annual Meeting of American Meteorological Society*, Phoenix, AZ, January -6-10, 2019.
36. Li Q~, Yang J, Wang ZH, Bou-Zeid E. Improving the representation of convective heat transfer in an urban canopy model. In: *7th International Building Physics Conference*, Syracuse, NY, September 23-26, 2018.
37. Wang ZH~. Energy-water trade-offs: Irrigating urban vegetation for cooling an arid city. In: *10th International Conference of Urban Climate (ICUC10)*, New York City, NY, August 06-10, 2018.
38. Wang C~, Li Q, Wang ZH. Quantifying the impact of urban trees on pollutant dispersion using a coupled LES-Lagrangian stochastic model. In: *10th International Conference of Urban Climate (ICUC10)*, New York City, NY, August 06-10, 2018.
39. Wang C~, Wang ZH, Li Q, Yang J. A coupled large-eddy simulation-Lagrangian stochastic modeling framework with applications to urban areas. In: *23rd Symposium on Boundary Layers and Turbulence*, American Meteorological Society, Oklahoma City, OK, June 11-15, 2018.
40. Wang C, Li Q, Wang ZH~. Impacts of urban trees on particle dispersion in street canyons: Modeling and applications. In: *8th International Symposium on Environmental Hydraulics*, University of Notre Dame, IN, June 04-07, 2018.
41. Li Q~, Wang ZH. Large-eddy simulation of the impact of urban trees on momentum and heat fluxes. In: *8th International Symposium on Environmental Hydraulics*, University of Notre Dame, IN, June 04-07, 2018.
42. Omidvar H~, Bou-Zeid E, Song J, Yang J, Arwatz G, Wang ZH, Hultmark M, Kaloush K. Rapid modification of land surface temperature during rainfall. In: *8th International*

Symposium on Environmental Hydraulics, University of Notre Dame, IN, June 04-07, 2018.

43. Bou-Zeid E⁻, Yang J, Omidvar H, Li D, Wang ZH, Ryu YH, Ramamurthy P. Hydrological determinants of temperature extremes in cities. In: *98th American Meteorological Society Annual Meeting*, Austin, TX, January 7-11, 2018.
44. Wang C⁻, Wang ZH, Yang J, Li Q. A Lagrangian stochastic urban footprint model: Model development and evaluation. In: *98th American Meteorological Society Annual Meeting*, Austin, TX, January 7-11, 2018.
45. Wang C⁻, Wang C, Myint SW, Wang ZH. Spatial and temporal variability of satellite-based aerosol optical depth in the dynamic urban environment. In: *2018 CAP LTER All Scientist Meeting*, Tempe, January 5, 2018.
46. Wang ZH⁻, Yang J. The potential water buffering capacity of urban green infrastructure in an arid environment. In: *2017 American Geophysical Union Annual Meeting, New Orleans, LA*, December 11-15, 2017.
47. Wang C⁻, Upreti R, Wang ZH, Yang J. Impacts of trees on urban environment in the Contiguous United States. In: *2017 American Geophysical Union Annual Meeting, New Orleans, LA*, December 11-15, 2017.
48. Omidvar H⁻, Bou-Zeid E, Song J, Yang J, Arwatz G, Wang ZH, Hultmark M, Kaloush K. Rapid modification of land surface temperature during rainfall. In: *2017 American Geophysical Union Annual Meeting, New Orleans, LA*, December 11-15, 2017.
49. Wang C⁻, Wang ZH, Yang J, Krayenhoff ES. Radiative shading effect of trees on the built environment in the contiguous United States. In: *2017 Urban Water Innovative Network (UWIN) Annual Meeting*, Denver, August 2, 2017. (Second place in student poster award)
50. Upreti R⁻, Wang ZH, Yang J. Assessment of impacts of land use change on urban hydroclimate for Phoenix, Denver, and Las Vegas. In: *2017 American Association for the Advancement of Science (AAAS) Annual Meeting*, Boston, February 16-20, 2017.
51. Omidvar H⁻, Bou-Zeid E, Song J, Yang J, Arwatz G, Wang ZH, Hultmark M, Kaloush K. Rapid modification of land surface temperature during rainfall. In: *97th Annual Meeting of American Meteorological Society*, Seattle, January 22-26, 2017.
52. Wang C⁻, Upreti R, Wang ZH, Yang J. Impact of shade trees on urban hydroclimate for Phoenix and the continental United States. In: *2017 CAP LTER All Scientist Meeting*, Tempe, January 13, 2017.
53. Templeton N⁻, Vivoni ER, Wang ZH, Schreiner-McGraw AP. Quantifying water and energy fluxes over different urban land covers in Phoenix, Arizona. In: *2017 CAP LTER All Scientist Meeting*, Tempe, January 13, 2017.
54. Yang J⁻, Wang ZH. Potential water buffering capacity of urban green infrastructure in a desert city. In: *AMS 32nd Conference on Agricultural and Forest Meteorology*, Salt Lake City UT, June 20-24, 2016.
55. Song J⁻, Wang ZH. Urban land-atmosphere coupling system: Model development and

- applications. In: AMS 22nd Symposium on Boundary Layer and Turbulence, Salt Lake City UT, June 20-24, 2016.
56. Yang J, Wang ZH⁻, Kaloush KE, Dylla H. Effect of pavement types on urban thermal environment. In: 4th International Conference on Countermeasures to Urban Heat Island, Singapore, May 31 – June 1, 2016.
 57. Yang J⁻, Wang ZH. Potential water buffering capacity of urban green infrastructure in the Phoenix metropolitan area. In: AZ water 89th Annual Conference, Gilbert AZ, May 13, 2016.
 58. Upreti R⁻, Wang ZH, Yang J. Assessing impact of landscape characteristics on urban hydroclimate. In: 2016 American Association for the Advancement of Science (AAAS) Annual Meeting, Washington DC, February 11-15, 2016.
 59. Upreti R⁻, Wang ZH, Yang J. Assessing impact of landscape characteristics on urban hydroclimate. In: 2016 CAP LTER All Scientist Meeting, Tempe, January 15, 2016.
 60. Yang J⁻, Wang ZH, and Kaloush KE. Unintended consequence of cool roofs. In: *2015 Annual Membership Meeting of the Cool Roof Rating Council*, Las Vegas, June 2015.
 61. Yang J⁻, Wang ZH, and Kaloush KE. Pavements and building energy efficiency. In: *Transportation Research Board 94th Annual Meeting*, Washington DC, January 2015.
 62. Wang ZH^{*}, Yang J. A novel approach in estimating surface energy balance: new perspective of urban-rural contrast in arid cities. In: *2015 American Geophysical Union Annual Meeting*, San Francisco, December 13-18, 2015.
 63. Song J⁻, Wang ZH. Quantifying the boundary-layer dynamics of carbon dioxide from a built environment using a coupled urban land-atmospheric model. In: *2015 American Geophysical Union Annual Meeting*, San Francisco, December 13-18, 2015.
 64. Yang J⁻, Wang ZH, Chen F, Georgescu M, Miao S, Voogt JA, Tewari M. Implementing hydrological processes into the coupled WRF-urban modeling system: Physical parameterizations and case studies. In: *Croucher Advanced Study Institute 2015-2016: Changing Urban Climate & the Impact on Urban Thermal Environment and Urban Living*, Hong Kong, December 7-11, 2015.
 65. Wang ZH⁻, Yang J. Optimizing urban irrigation schemes for a trade-off between energy and water consumption. In: *9th International Conference on Urban Climate (ICUC9)*, Toulouse, France, July 20-24, 2015.
 66. Wang ZH⁻, Song J. Interfacing the urban land-atmosphere system with a coupled UCM-SCM framework: model development and sensitivity. In: *9th International Conference on Urban Climate (ICUC9)*, Toulouse, France, July 20-24, 2015.
 67. Ryu YH, Bou-Zeid E, Wang ZH⁻, Smith J. Development and implementation of tree processes in an urban canopy model. In: *9th International Conference on Urban Climate (ICUC9)*, Toulouse, France, July 20-24, 2015.
 68. Yang L, Niyogi D⁻, Schmid P, Li Q, Wang ZH, Vose R, Smith J. Urban signatures in planetary boundary-layer heights: Evidence from high-resolution rawinsonde observations.

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69. Wang ZH⁻, Yang J. Estimation of land surface energy partitioning: A novel approach using a single depth soil measurement. In: *American Meteorological Society 95th Annual Meeting*, Phoenix, AZ, January 2015.
 70. Song J⁻, Wang ZH. Impact of built environments on hydroclimate through coupled land-atmospheric modeling, In: *American Meteorological Society 95th Annual Meeting*, Phoenix, AZ, January 2015.
 71. Yang J⁻, Wang ZH, Chen F, and Georgescu M. Effect of surface hydrological processes in urban climate with case study of green roofs. In: *American Meteorological Society 95th Annual Meeting*, Phoenix, AZ, January 2015.
 72. Zhao X⁻, Wang ZH. Effect of shade trees on building energy efficiency. In: *17th Annual CAP LTER All-Scientist Meeting*. Tempe, AZ, January 2015.
 73. Yang J⁻, Wang ZH. Shift of paradigm in urban irrigation: Finding the optimal scheme for building energy efficiency. In: *17th Annual CAP LTER All-Scientist Meeting*. Tempe, AZ, January 2015.
 74. Song J⁻, Wang ZH, Vivoni ER, Mascaro G, Ruddell BL. Investigating the impacts of urbanization on regional hydrometeorology by coupling an urban canopy model into a distributed hydrological model. In: *17th Annual CAP LTER All-Scientist Meeting*. Tempe, AZ, January 2015.
 75. Song J⁻, Wang ZH, Effect of landuse landcover changes on urban land-atmosphere interactions. In: *87th AZ Water Annual Conference*, Glendale, Arizona, May 2014.
 76. Yang J⁻, Wang ZH, Chen F, Miao S, Tewari M and Georgescu M. Towards realistic representation of hydrological processes in integrated WRF-urban modeling system. In: *European Geosciences Union General Assembly 2014*. Vienna, Austria, April 2014.
 77. Wang ZH⁻, Yang J. Sensitivity analysis of hydrological modeling in the WRF-Urban modeling system using advanced Monte Carlo simulations, In: *American Meteorological Society 94th Annual Meeting*, Atlanta, GA, February 2014.
 78. Yang J⁻, Wang ZH, Chen F, Miao S, Tewari M. Enhancing hydrological modeling in the coupled WRF-urban modeling system, In: *American Meteorological Society 94th Annual Meeting*, Atlanta, GA, February 2014.
 79. Chen F⁻, Miao S, Tewari M, Barlage M, Yang J, Wang ZH, Meng C, Ching J. Recent Enhancements to the Integrated WRF-Urban Modeling System, In: *American Meteorological Society 94th Annual Meeting*, Atlanta, GA, February 2014.
 80. Song J⁻, Yang J, Wang ZH. Studying urban land-atmospheric interactions by coupling an urban canopy model with a single column atmospheric model. In: *16th Annual CAP LTER All-Scientist Meeting*. Tempe, AZ, January 2014.
 81. Yang J⁻, Wang ZH. Assessing the Potential and Sensitivity of Green Roof System in

- Mitigating Urban Environmental Problems, In: *AZ Water Research Workshop*, Tempe, AZ, January 2014.
82. Pourshams-Manzouri T-, Stempihar JJ, Kaloush KE, Wang ZH. Pavement effects on near surface air temperature and urban heat island, In: 93rd Annual Meeting of Transportation Research Board, Washington DC, January 2014.
 83. Song J-, Wang ZH. Studying urban land-atmospheric interactions by coupling an urban canopy model with single column atmospheric models, In: *American Geophysical Union Fall Meeting*. San Francisco, CA, December 2013.
 84. Wang ZH-, Yang J. Test and sensitivity analysis of hydrological modeling in the coupled WRF-urban modeling system, In: *American Geophysical Union Fall Meeting*. San Francisco, CA, December 2013.
 85. Yang J-, Song J, Wang ZH. Modeling hydrological processes in the coupled urban-land-atmosphere system. In: *2013 NSF CAP LTER Site Review*. Tempe, AZ, September, 2013.
 86. Song J-, Yang J, Wang ZH. Modeling CAP-LTER flux tower measurements using an advanced urban canopy model. In: *15th Annual CAP LTER All-Scientist Meeting*. Tempe, AZ, January 2013.
 87. Wang ZH-, A theoretic framework for coupled heat and moisture transfer in soils. In: *2012 American Geophysical Union Fall Meeting*. San Francisco, CA, December 2012.
 88. Bou-Zeid E-, Wang ZH, Ramamurthy P, Ting S, Li D, Smith JA. The urban water cycle and how it modulates the microclimate and the energy cycle. In *2012 American Geophysical Union Fall Meeting*. San Francisco, CA, December 2012.
 89. Wang ZH, Bou-Zeid E-, Smith JA. A coupled energy transport and hydrological model for urban canopies. In: *The International Association for Urban Climate (IAUC) Eighth International Conference on Urban Climate*. Dublin, Ireland, August, 2012.
 90. Wang ZH-. A unified theoretic framework for reconstructing soil thermal field from single depth measurements. In: *30th AMS Conference on Agricultural and Forest Meteorology*. Boston, MA, June 2012.
 91. Wang ZH-, Bou-Zeid E, Smith JA. A coupled energy transport and hydrological model for urban canopies. In: *2011 American Geophysical Union Fall Meeting*. San Francisco CA, December 2011.
 92. Wang ZH-, Bou-Zeid E, Smith JA. A new urban surface exchange scheme: coupling physically-based energy transport with hydrological model. In: *European Geoscience Union General Assembly 2011*. Vienna, Austria, April 2011.
 93. Wang ZH-, Bou-Zeid, Smith JA, Au SK, Miller S, Schreiber D. Towards improving energy budgets in urban canopy models. In: *2010 American Geophysical Union Fall Meeting*. San Francisco CA, December 2010.
 94. Wang ZH, Bou-Zeid E-, Smith JA. Simple models and sensor networks to study flow and energy transport in urban canopies. In: *Ninth Symposium on the Urban Environment*.

Keystone CO, August 2010.

95. Wang ZH⁺, Bou-Zeid E, Smith JA. A sensor network to study turbulent fluxes in urban canopies. In: *Fluid Dynamics & the Global Environment, the 2nd SEAS-AOS-GFDL workshop*, Princeton NJ, May 2010.
96. Wang ZH⁺, Bou-Zeid E, Smith JA. Application of a sensor network to study the energy budget in urban canopies. In: *90th Annual Meeting of American Meteorological Society*, Atlanta GA, January 2010.

PROFESSIONAL ACTIVITIES AND SERVICE

SUMMARY OF PROFESSIONAL ACTIVITIES AND SERVICE

Journal Editorial Board: 2

- *Urbanization, Sustainability and Society*, Editorial Board member (2023-present)
- *PLoS One*, Academic Editor (2018-2022)

Journal Guest Editor of Special Issues: 3

- Guest editor, Special issue *Climate change impacts on public health and lives and strategies for resilient and liveable cities*, Urban Climate, Elsevier (2022-2023)
- Guest editor, Special issue *Development and applications of advanced urban models across scales*, Journal of Advances in Modeling Earth Systems (JAMES), American Geophysical Union (2022-2024)
- Handling academic editor, Special collection *Urban Ecosystems*, PLoS One (2019)

International/National Professional Committees: 1

- Board of Urban Environment, American Meteorological Society (AMS) (2014-2016)

International/National Conference Sessions Organized: 3

- Future Energy Landscape Working Group, In: 4th APRU Sustainable Cities and Landscapes Conference (virtual), 14-18 December 2020.
- Scientific Committee, In: Architectural Science Association (ASA) 2020 Conference, Auckland, New Zealand, 25-28 November 2020.
- Joint Board of Urban Environment Conferences with 30th Conference of Hydrology, In: 96th American Meteorological Society Annual Meeting, New Orleans, LA, January 2016.

International/National Conference Sessions Chaired: 2

- Session 6C Urban Design and Planning with Climate, In: 10th International Conference of Urban Climate/14th Symposium on the Urban Environment, New York City, NY, August 08, 2018.
- 11th Symposium on the Urban Environment, In: 94th American Meteorological Society Annual Meeting, Atlanta, GA, January 2014.

Membership of National/International Professional Societies: 5

- American Meteorological Society (AMS), member since 2009
- American Physical Society (APS), member since 2009
- American Geophysical Union (AGU), member since 2010
- International Association for Urban Climate (IAUC), member since 2009
- American Society of Civil Engineers (ASCE), member since 2017

Chair/Leader of Research Centers: 2

- National Center of Excellence on SMART Innovations, Co-director for Climate System Research (2012 - present).
- Urban Climate Research Center (UCRC), Leadership Team (2016 - 2022).

ASU-Level Committee: 1

- ASU Research Computing Governance Board (2022-)
- ASU Working Group for Research Computing (2015 - 2017)

School-Level Committees: 6

- SEBE Advisory Committee (2018 – 2021, 2022 - 2024)
- SEBE Awards Committee (2019 - 2022)
- Faculty Search Committees (2014, 2015, 2019)
- SEBE Laboratory Committee (2015 - 2018)
- SEBE Curriculum Committee (2015 - 2016)
- CESE Scholarship Committee (2012 - 2018)

Review Panelist for National Agencies: 4

- U.S. Department of Energy (DoE) (2022)
- National Aeronautics and Space Administration (NASA) (2017-2020)
- National Science Foundation (NSF) (2016)
- U.S. Environmental Protection Agency (USEPA) (2013, 2015)

Proposal Reviewer for National/International Funding Agencies: 7

- National Science Foundation (NSF)
- Army Research Office (ARO)
- National Aeronautics and Space Administration (NASA)
- U.S. Environmental Protection Agency (USEPA)
- U.S. Department of Energy (DoE)
- U.K. Natural Environment Research Council (NERC)
- Canada Foundation for Innovation (CFI)
- Netherlands Organisation for Scientific Research

Peer Reviewer for Journals: 95 journals in total (selected recent journals shown below)

- Applied Energy
- Environmental Science & Technology
- Geophysical Research Letters
- Geoscientific Model Development
- Journal of Climate
- Journal of Hydrology
- Landscape and Urban Planning

- Nature Communications
- Remote Sensing of Environment
- Renewable & Sustainable Energy Reviews
- Water Resources Research

Reviewer for Policy Reports: 2

- NPCC 3rd report: Chapter 2: Climate Science, New York City Panel on Climate Change 2018.
- Arizona BRACE Report II: Vulnerability Assessment and Disease Projections for Climate and Extreme Weather Hazards, Arizona State University, 2016.

Reviewer for Book Proposals: 5

- Faisal Hossain, 2023, *Tracking Water from Space: A Water Management Perspective*, McGraw Hill.
- Turshen M, & Schneider D, 2019, *The Violence of Global Climate Change: Shattered lives and livelihoods*, Elsevier.
- Metzger J, Lindblad J (Eds.), 2018, *Difficult Doings: The Challenging Practice of Sustainable Urban Development*, Taylor & Francis/Routledge.
- Barry R, and Blanken P, 2015, *Microclimates and Local Climates*, Cambridge University Press.
- Brutsaert W, 2014, *Hydrology – An Introduction*, 2nd Ed. Cambridge University Press.

PERSONNEL: STUDENT SUPERVISION/MENTORING, TEACHING, DISSERTATION COMMITTEES, RESEARCH, AND OUTREACH

SUMMARY OF MENTORING

Ph.D. Students Graduated: 4

- Peiyuan Li (Fall 2021): currently post-doc researcher at UIUC
- Chenghao Wang (Fall 2019): currently faculty member at the University of Oklahoma
- Jiyun Song (Fall 2016): currently faculty member at the University of Hong Kong
- Jiachuan Yang (Fall 2016): currently faculty member at Hong Kong University of Science and Technology

Ph.D. Students Current: 3

- Negar Rahmatollahi (Fall 2023 – present)
- Yihang Wang (Fall 2022 – present)
- Xueli Yang (Fall 2019 – present)

M.S. Students Graduated: 3

- Ruby Upreti (Summer 2017)
- Jiachuan Yang (Fall 2012)
- Tina Pourshams-Manzouri (Spring 2013, co-advised with K. Kaloush)

Undergraduate Students (Research): 4

- Denisse Arellano (2019): Learn Explore Advance Design (LEAD) fellowship
- Rachel Von Gnechten (Spring 2017), Honors thesis
- Hannah Housenga (Spring 2015, co-advised with K. Kaloush), Honors thesis
- David Little (Spring 2013), independent student researcher

Visiting Graduate Students: 3

- Haoran Hou (Ph.D. student, Chinese Academy of Science, 02/2022-06/2023)
- Fan Huang (Ph.D. student, Nanjing University, 09/2016-12/2017)
- Xiaoxi Zhao (M.S. student, China Three Gorge University, 09/2014-03/2015)

Student Fellowships and Awards: 15

- Xueli Yang: Engineering Graduate Fellowship, Ira A. Fulton Schools of Engineering, ASU, 2022
- Peiyuan Li: National Award for Outstanding Self-financed Chinese Students Study Abroad, China Scholarship Council, 2021
- Peiyuan Li: Dean's Dissertation Award, Ira A. Fulton Schools of Engineering, ASU, 2021
- Peiyuan Li: Ph.D. Dissertation Completion Fellowship, Graduate College, ASU, 2021
- Peiyuan Li: Engineering Graduate Fellowship, Ira A. Fulton Schools of Engineering, ASU, 2020
- Chenghao Wang: National Award for Outstanding Self-financed Chinese Students Study Abroad, China Scholarship Council, 2019
- Chenghao Wang: Outstanding Research Award, ASU Graduate & Professional Student Association, 2019
- Chenghao Wang: Ph.D. Dissertation Completion Fellowship, ASU Graduate College, 2019

- Chenghao Wang: Teaching Excellence Award, ASU Graduate & Professional Student Association, 2017
- Jiyun Song: Best Dissertation Award, Chinese-American Oceanic and Atmospheric Association (COAA), 2017
- Jiachuan Yang: Dean's Dissertation Award, Ira A. Fulton Schools of Engineering, ASU, 2016
- Jiyun Song: National Award for Outstanding Self-financed Chinese Students Study Abroad, China Scholarship Council, 2016
- Ruby Upreti: Hydrological Science Graduate Student Fellowship, Ivanhoe Foundation, 2016
- Jiachuan Yang: National Award for Outstanding Self-financed Chinese Students Study Abroad, China Scholarship Council, 2015
- Jiachuan Yang: Croucher Advanced Study Institute Travel Award, Chinese University of Hong Kong, 2015

Graduate Student Advisory Committees: 24

- Shiqi Wei (Ph.D.) – in progress
- Chuncheng Yao (Ph.D.) – in progress
- Isaiah Wall (Ph.D.) – in progress
- Qianqiu Longyang (Ph.D.) – in progress
- Shuai Shuai (Ph.D.) – in progress
- Zhaocheng Wang (Ph.D.) – Spring 2023
- Meteb Mejbil (M.S.) – Fall 2021
- Ara Ko (Ph.D.) – Fall 2018
- Chuyuan Wang (Ph.D.) – Summer 2018
- Jenita Gautam (M.S.) – Spring 2018
- Qunshan Zhao (Ph.D.) – Fall 2017
- Nicole Templeton (Ph.D.) – Summer 2017
- Tiantian Xiang (Ph.D.) – Summer 2016
- Mason Lacy (M.S.) – Spring 2016
- Sushant George (M.S.) – Spring 2016
- Jorge E. Cazares Rodrigues (M.S.) – Fall 2015
- Puneet N. Khatavkar (M.S.) – Fall 2015
- Daniel Che (Ph.D.) – Summer 2015
- Cody Anderson (M.S.) – Fall 2013
- Thomas Volo (M.S.) – Summer 2013
- Houk Paek (Ph.D.) – Spring 2013
- Nicole Pierini (M.S.) – Spring 2013
- Hernan Moreno Ramirez (Ph.D.) – Summer 2012
- Gretchen Hawkins (M.S.) – Summer 2012

Professional Development Program: 1

- Participation in the Just-in-Time Teaching with Pedagogy to the Multiple Disciplinary (JTFD) Program (2016 Fall – 2017 Spring), Ira A. Fulton Schools of Engineering, ASU

SUMMARY OF TEACHING

Undergraduate Courses Taught, including New Course Development: 2

- CEE 341: Fluid Mechanics for Civil Engineers
- CEE 466: Urban Water System Design

Graduate Courses Taught, including New Course Development: 4

- CEE 598: Environmental Fluid Mechanics
- CEE 598: Hydrometeorology
- CEE 598: Atmospheric Convection and Thermodynamics
- CEE 598: Urban Water System Design

List of Courses Taught at ASU (Evaluation scale out of 5, with 5 being the most effective)

Semester	Course	Title	Number of students	Credit hours	Average score (course)	Average score (instructor)
Spring 23	CEE 598	Atmospheric Convection and Thermodynamics	9	3.0	4.89	4.87
Fall 22	CEE 598	Urban water system design	5	3.0	4.76	5
Fall 22	CEE 466	Urban water system design	40	3.0	4.49	4.65
Spring 22	CEE 598	Environmental Fluid Mechanics	4	3.0	5	5
Spring 22	CEE 598	Hydrometeorology	7	3.0	5	5
Fall 21	CEE 598	Urban water system design	11	3.0	4.97	4.97
Fall 21	CEE 466	Urban water system design	28	3.0	4.35	4.68
Spring 21	CEE 598	Environmental Fluid Mechanics	7	3.0	4.81	4.83
Spring 21	CEE 598	Atmospheric Convection & Thermodynamics	5	3.0	4.94	4.89
Fall 20	CEE 598	Urban water system design	7	3.0	4.61	4.54
Fall 20	CEE 466	Urban water system design	45	3.0	4.20	4.47
Spring 20	<i>Sabbatical leave</i>					
Fall 19	CEE 598	Urban water system design	8	3.0	4.56	4.79
Fall 19	CEE 466	Urban water system	46	3.0	4.56	4.59

		design				
Spring 19	CEE 598	Environmental Fluid Mechanics	9	3.0	4.83	4.82
Spring 19	CEE 341	Fluid Mechanics for Civil Engineers	83	4.0	3.90	3.98
Fall 18	CEE 598	Urban water system design ²	5	3.0	4.66	4.53
Fall 18	CEE 466	Urban water system design ²	34	3.0	3.97	4.20
Spring 18	CEE 598	Atmospheric Convection & Thermodynamics	9	3.0	4.84	4.93
Spring 18	CEE 341	Fluid Mechanics for Civil Engineers	91	4.0	4.08	4.13
Fall 2017	CEE 598	Hydrometeorology	15	3.0	4.79	4.90
Spring 17	CEE 598	Environmental Fluid Mechanics	6	3.0	4.76	4.89
Spring 17	CEE 341	Fluid Mechanics for Civil Engineers	87	4.0	4.07	4.29
Fall 16	CEE 598	Atmospheric Convection & Thermodynamics	12	3.0	4.74	4.89
Spring 16	CEE 598	Environmental Fluid Mechanics	13	3.0	4.66	4.70
Spring 16	CEE 341	Fluid Mechanics for Civil Engineers	88	4.0	3.98	3.88
Fall 15	CEE 598	Hydrometeorology	8	3.0	4.82	4.96
Spring 15	CEE 598	Atmospheric Convection & Thermodynamics ¹	6	3.0	4.63	4.93
Spring 15	CEE 341	Fluid Mechanics for Civil Engineers	80	4.0	4.11	4.17
Fall 14	CEE 598	Environmental Fluid Mechanics	10	3.0	4.67	4.76
Spring 14	CEE 341	Fluid Mechanics for Civil Engineers	47	4.0	4.51	4.38
Fall 13	CEE 598	Hydrometeorology ¹	10	3.0	4.49	4.74
Spring 13	CEE 341	Fluid Mechanics for Civil Engineers	53	4.0	4.35	4.56
Fall 12	CEE 598	Environmental Fluid	6	3.0	4.64	4.52

		Mechanics ¹				
Spring 12	CEE 341	Fluid Mechanics for Civil Engineers ²	56	4.0	4.08	3.97

¹New course to the University

²New/revised materials for an existing course

RESEARCH SUPPORT

SUMMARY OF RESEARCH SUPPORT

Funded Projects: (SP: Senior Personnel; * ASU institutional PI on collaborative projects)

ABOR: Arizona Board of Regents

ARO: Army Research Office

NAPA: National Asphalt Pavement Association

NASA: National Aeronautics and Space Administration

NSF: National Science Foundation

NTC: National Transportation Center

SRP: Salt River Project Arizona

Agency	Title	Role	Period	Project total	My recogn.
SRP	Smart Irrigation of Arizona's Urban Trees for Heat Mitigation and Water Saving	PI	8/1/23-8/31/24	\$70,000	\$70,000
NSF	CAS-Climate: Actionable heat and carbon mitigation by urban greening: Integrating physical modeling and machine learning for decision support	PI	5/1/23-4/30/26	\$746,097	\$447,658
ABOR	Smart Tree Watering in Arizona's Urban Environment	PI*	1/17/23-1/16/25	\$231,791	\$115,895
NSF	Collaborative Research: Geoengineering of Urban Green Infrastructure to Improve Outdoor Livability	PI*	11/1/20-10/31/23	\$300,000	\$120,000
NASA	Connecting Urbanization to Patterns of Heat and Precipitation Risk: Linking Mechanistic Understanding to Quantification by Remote Sensing	Co-PI	7/1/20-6/30/23	\$1,468,268	\$288,382
NSF	Co-evolution of anthropogenic stressors and regional urban hydroclimate through multiscale land-atmosphere interactions	PI	12/1/19-11/30/22	\$150,000	\$150,000
NAPA	Critical review and gap analysis of impacts from pavements on urban heat island	PI	8/1/18-7/31/19	\$63,326	\$31,663

NSF	LTER: CAP IV - Investigating urban ecology and sustainability through the lens of Urban Ecological Infrastructure	SP	12/1/18-11/30/22	\$4,507,998	\$90,160
ARO	The impact of landscape characteristics on urban surface energy balance	PI	1/1/16-9/30/16	\$50,000	\$50,000
NTC	Sustainability and scaling of urban transportation networks	PI	1/1/16-12/31/16	\$30,062	\$21,043
NSF	Urban Water Innovation Network (U-WIN): Transitioning Toward Sustainable Urban Water Systems; PI: A. Mazdak (CSU)	Co-PI*	9/15/15-9/14/18	\$1,191,572	\$345,556
NSF	DMUU: DCDC III: Transformational Solutions for Urban Water Sustainability Transitions in the Colorado River Basin	SP	9/1/15-8/31/19	\$4,499,926	\$90,000
ARO	Rapid modifications of land surface temperature during rainfall: basics and implications	PI*	9/1/14-5/31/18	\$360,263	\$89,999
NSF	Sustainable urban development in the Sun Corridor: Finding engineering alternatives through coupled WRF-urban land surface modeling	PI	9/1/14-8/31/18	\$299,838	\$269,854
NAPA	Effect of pavement materials on building energy efficiency	PI	7/1/14-6/30/15	\$75,041	\$60,033
NAPA	Unintended consequence of reflective pavements	PI	3/15/13-12/31/13	\$19,618	\$15,694
SRP	Temperature effects on the water level height measurements	Co-PI	09/01/12-08/31/14	\$38,212	\$19,106

Last updated: 7/30/2023