

Dan Li

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Research Interests

- Urban Climate and Urban Hydrology
- Boundary Layer Meteorology and Micrometeorology
- Environmental Fluid Mechanics and Turbulence
- Multi-Scale Numerical Modeling

Professional Experience

- **2016.1 - current** **Assistant Professor**
Department of Earth and Environment, Boston University, USA
(Also a faculty affiliate at the Initiative on Cities and the Hariri Institute for Computing)
- **2013.12 - 2015.12** **Postdoctoral Research Associate**
Program of Atmospheric and Oceanic Sciences, Princeton University, USA

Visiting Appointments

- **2020.03 - 2020.08** **Visiting Scholar**
Institute of Meteorology and Climatology, Leibniz Universität Hannover, Germany
- **2019.06 - 2019.08** **Visiting Scholar**
Program of Atmospheric and Oceanic Sciences, Princeton University, USA
- **2013.12 - 2015.12** **Visiting Scientist**
Geophysical Fluid Dynamics Laboratory, Princeton, USA

Education

- **2009.9 - 2013.9** **Ph.D. in Civil and Environmental Engineering**
Dissertation: "Surface-atmosphere interaction: the impact of buoyancy and heterogeneity"
Department of Civil and Environmental Engineering, Princeton University, USA
- **2005.9 - 2009.7** **Bachelor in Hydraulic Engineering**
Department of Hydraulic Engineering, Tsinghua University, China

Honors & Awards

- 2020.1 Humboldt Fellowship for Experienced Researchers Humboldt Fellowship
- 2018.9 Young Investigator Program Army Research Office
- 2016.9 Junior Faculty Fellow of Hariri Institute for Computing Boston University
- 2014.5 Outstanding Students Abroad China Scholarship Council
- 2012.12 Outstanding Student Paper Award American Geophysical Union

➤ 2012.5	Princeton Energy and Climate Scholars	Princeton University
➤ 2012.5	Wu Prize for engineering graduate students who have performed at the highest level as scholars and researchers	Princeton University
➤ 2011.6	Science, Technology, Environmental Policy Fellowship	Princeton University
➤ 2009.8	Outstanding Students in Hydraulic Engineering	Chinese Ministry of Education

Publications (*corresponding author, advisees, visiting students)

In review, in revision, in press:

1. Vahmani, P.*, A. Jones, **D. Li**, (in press) Will anthropogenic warming increase evapotranspiration? Examining irrigation water demand implications of climate change in California, *Earth's Future*
2. Maronga, B*, M. Winkler, **D. Li** (in review) Can area-wide building retrofitting affect the urban microclimate? An LES study for Berlin, Germany, *Journal of Applied Meteorology and Climatology*

Published:

3. Chen, W., Y. Y. Zhou*, Y. H. Xie, G. Chen, K. J. Ding, **D. Li** (2022): Estimating Spatial and Temporal Patterns of Urban Building Anthropogenic Heat using a bottom-up City Building Heat Emission Model, *Resources, Conservation & Recycling*, 177, 105996
4. Chen, C.*, **D. Li**, T. Keenan (2021): Enhanced surface urban heat islands due to divergent urban-rural greening trends, *Environmental Research Letters*, 16, 124071.
5. Zhou, W. Y.*, L. Wang*, **D. Li**, L. R. Leung (2021): Spatial pattern of lake evaporation increases under global warming linked to regional hydroclimate change, *Communications Earth & Environment*, 2, 255
6. Sun, K.*, L. Li, S. Jagini, and **D. Li**, (2021): A satellite-data-driven framework to rapidly quantify air-basin-scale NOx emissions and its application to the Po Valley during the COVID-19 pandemic. *Atmos. Chem. Phys.*, 21, 13311-13332.
7. Smith, I. A.*, J. B. Winbourne, K. F. Tieskens, T. S. Jones, F. L. Bromley, **D. Li**, and L. R. Huttyra, (2021): A Satellite-Based Model for Estimating Latent Heat Flux From Urban Vegetation. *Frontiers in Ecology and Evolution*, 9.
8. Geddes, J. A.*, B. Wang, and **D. Li**, (2021): Ozone and Nitrogen Dioxide Pollution in a Coastal Urban Environment: The Role of Sea Breezes, and Implications of Their Representation for Remote Sensing of Local Air Quality. *Journal of Geophysical Research: Atmospheres*, 126, e2021JD035314.
9. Maronga, B*, **D. Li**, (2021) An investigation of the grid sensitivity in large-eddy simulations of the stable boundary layer, *Boundary-Layer Meteorol.* <https://doi.org/10.1007/s10546-021-00656-8>
10. Wang, L., M. Huang, and **D. Li***, (2021): Strong influence of convective heat transfer efficiency on the cooling benefits of green roof irrigation. *Environmental Research Letters*, 16, 084062.
11. Wang, L., **D. Li***, (2021): Urban heat islands during heat waves: a comparative study between Boston and Phoenix, *J Appl Meteorol Clim*, <https://doi.org/10.1175/JAMC-D-20-0132.1>

12. Cheng, Y.*, Q. Li, **D. Li**, P. Gentine, (2021): Logarithmic profile of temperature in sheared and unstably stratified atmospheric boundary layers, *Physical Review Fluids*, 6(3), 034606, doi: 10.1103/PhysRevFluids.6.034606.
13. Liao, W. L., **D. Li**, S. Malyshev, E. Shevliakova, H. Zhang, X.P. Liu*, (2021): Amplified Increases of Compound Hot Extremes over Urban Land in China, *Geophys. Res. Lett.* 48, e2020GL091252.
14. Wang, L., **D. Li***, N. Zhang, J. Sun, and W. Guo (2020): Surface Urban Heat and Cool Islands and Their Drivers: An Observational Study in Nanjing, China, *J Appl Meteorol Clim*, 59(12), 1987-2000, doi: 10.1175/jamc-d-20-0089.1.
15. **Li, D***. (2020): The O'KEYPS Equation and 60 Years Beyond, *Boundary-Layer Meteorol*, doi: 10.1007/s10546-020-00585-y.
16. Chen, C.*, **D. Li***, Y. Li, S. L. Piao, X. H. Wang, M. Y. Huang, P. Gentine, R. R. Nemani, and R. B. Myneni (2020): Biophysical impacts of Earth greening largely controlled by aerodynamic resistance, *Science Advances*, 6(47), doi: ARTN eabb1981
17. Chen, C., L. Wang, R. B. Myneni, and **D. Li*** (2020): Attribution of Land-Use/Land-Cover Change Induced Surface Temperature Anomaly: How Accurate Is the First-Order Taylor Series Expansion?, *J Geophys Res-Bioge*, 125(9), doi: ARTN e2020JG005787
18. Zhang, Y. J., K. Sun*, Z. Q. Gao, Z. T. Pan, M. A. Shook, and **D. Li** (2020): Diurnal Climatology of Planetary Boundary Layer Height Over the Contiguous United States Derived From AMDAR and Reanalysis Data, *J Geophys Res Atmos*, 125(20), doi: ARTN e2020JD032803, 10.1029/2020JD032803.
19. Liao, W. L., X. Liu*, E. Burakowski, D. Wang, L. Wang, and **D. Li** (2020): Sensitivities and Responses of Land Surface Temperature to Deforestation-Induced Biophysical Changes in Two Global Earth System Models, *Journal of Climate*, 33(19), 8381-8399, doi: 10.1175/jcli-d-19-0725.1.
20. Campbell, P. C.*, J. O. Bash, J. A. Herwehe, R. C. Gilliam, and **D. Li** (2020): Impacts of Tiled Land Cover Characterization on Global Meteorological Predictions Using the MPAS-A, *Journal of Geophysical Research: Atmospheres*, 125(15), e2019JD032093, doi: 10.1029/2019jd032093.
21. Wang, L., M. Huang, and **D. Li*** (2020): Where Are White Roofs More Effective in Cooling the Surface?, *Geophys. Res. Lett.*, 47(15), e2020GL087853, doi: 10.1029/2020gl087853.
22. Winbourne, J. B.*, T. S. Jones, S. M. Garvey, J. L. Harrison, L. Wang, **D. Li**, P. H. Templer, and L. R. Hutya (2020): Tree Transpiration and Urban Temperatures: Current Understanding, Implications, and Future Research Directions, *Bioscience*, 70(7), 576-588, doi: 10.1093/biosci/biaa055.
23. Yao, J., H. Liu*, J. Huang*, Z. Gao, G. Wang, **D. Li**, H. Yu, and X. Chen (2020): Accelerated dryland expansion regulates future variability in dryland gross primary production, *Nat Commun*, 11(1), 1665, doi: 10.1038/s41467-020-15515-2.
24. Ji, P., X. Yuan*, and **D. Li**, (2020): Atmospheric Radiative Processes Accelerate Ground Surface Warming over the Southeastern Tibetan Plateau during 1998–2013. *Journal of Climate*, 33, 1881-1895.
25. Moon, M.*, **D. Li**, W. Liao, A. J. Rigden, and M. A. Friedl, (2020): Modification of surface energy balance during springtime: The relative importance of biophysical and meteorological changes. *Agric For Meteorol*, 284, 107905.

26. Zhang, Y., L. Wang, J. A. Santanello, Z. Pan, Z. Gao, and D. Li*, (2020): Aircraft observed diurnal variations of the planetary boundary layer under heat waves. *Atmos. Res.*, 235, 104801.
27. Li, D.*, and L. Wang, (2019): Sensitivity of Surface Temperature to Land Use and Land Cover Change-Induced Biophysical Changes: The Scale Issue. *Geophys. Res. Lett.*, 46, 9678-9689.
28. Ao, X. Y., L. Wang, X. Zhi, W. Gu, H. Q. Yang, and D. Li*, (2019): Observed Synergies between Urban Heat Islands and Heat Waves and Their Controlling Factors in Shanghai, China. *J Appl Meteorol Clim*, 58, 1955-1972.
29. Zhou, Y. Z., D. Li*, and X. Li*, (2019): The Effects of Surface Heterogeneity Scale on the Flux Imbalance under Free Convection. *J Geophys Res Atmos*, 124, 8424-8448.
30. Lan, C. X., H. P. Liu*, G. G. Katul, D. Li, and D. Finn, (2019): Large Eddies Regulate Turbulent Flux Gradients in Coupled Stable Boundary Layers. *Geophys. Res. Lett.*, 46, 6090-6100.
31. Wang, P., D. Li*, W. L. Liao, A. Rigden, and W. Wang, (2019): Contrasting Evaporative Responses of Ecosystems to Heatwaves Traced to the Opposing Roles of Vapor Pressure Deficit and Surface Resistance. *Water Resour. Res.*, 55, 4550-4563.
32. Wang, L., and D. Li*, (2019): Modulation of the urban boundary-layer heat budget by a heatwave. *Q J R Meteorol Soc*, 145, 1814-1831.
33. Li, D.*, W. L. Liao, A. J. Rigden, X.P. Liu, Dagang Wang, S. Malyshev, E. Shevliakova (2019), Urban heat island: aerodynamics or imperviousness? *Science Advances*, 5, eaau4299.
34. Zhang, Y. J., D. Li*, Z. K. Lin, J. A. Santanello, and Z. Q. Gao, (2019): Development and Evaluation of a Long-Term Data Record of Planetary Boundary Layer Profiles From Aircraft Meteorological Reports. *J Geophys Res Atmos*, 124, 2008-2030.
35. Katul, G., D. Li, C. Manes (2019): A primer on turbulence in hydrology and hydraulics: The power of dimensional analysis, *WIREs Water*. <https://doi.org/10.1002/wat2.1336>
36. Li, D.* (2019): Turbulent Prandtl Number in the Atmospheric Boundary Layer - Where Are We Now? *Atmos. Res.* 216, 86-105.
37. Liao, W. L., X. Liu*, D. Li, M. Luo, D. Wang, S. Wang, et al (2018): Stronger Contributions of Urbanization to Heat Wave Trends in Wet Climates. *Geophys. Res. Lett.*, 45. <https://doi.org/10.1029/2018GL079679>
38. Rigden, A.*, D. Li, and G. Salvucci, (2018): Dependence of thermal roughness length on friction velocity across land cover types: A synthesis analysis using AmeriFlux data. *Agric For Meteorol.* 249, 512-519.
39. Jacobs, S. J.*, A. J. E. Gallant, N. J. Tapper, and D. Li, (2018): Use of Cool Roofs and Vegetation to Mitigate Urban Heat and Improve Human Thermal Stress in Melbourne, Australia. *J Appl Meteorol Clim*, 57, 1747-1764.
40. Lan, C. X., H. P. Liu*, D. Li, G. G. Katul, and D. Finn, (2018): Distinct Turbulence Structures in Stably Stratified Boundary Layers With Weak and Strong Surface Shear. *J Geophys Res-Atmos*, 123, 7839-7854.
41. Zhou, Y. Z., D. Li, H. P. Liu, and X. Li*, (2018): Diurnal Variations of the Flux Imbalance Over Homogeneous and Heterogeneous Landscapes. *Boundary-Layer Meteorol*, 168, 417-442.
42. Peng, L. Q.*, D. Li, and J. Sheffield, (2018): Drivers of Variability in Atmospheric Evaporative Demand: Multiscale Spectral Analysis Based on Observations and Physically Based Modeling. *Water Resour. Res.*, 54, 3510-3529.

43. Liao, W. L., A. J. Rigden, and **D. Li***, (2018): Attribution of Local Temperature Response to Deforestation. *J Geophys Res-Bioge*, 123, 1572-1587.
44. Gao, Z. M., H. P. Liu*, **D. Li**, G. G. Katul, and P. D. Blanken, (2018): Enhanced Temperature-Humidity Similarity Caused by Entrainment Processes With Increased Wind Shear. *J Geophys Res-Atmos*, 123, 4110-4121.
45. **Li, D.***, G. G. Katul, and H. P. Liu, (2018): Intrinsic Constraints on Asymmetric Turbulent Transport of Scalars Within the Constant Flux Layer of the Lower Atmosphere. *Geophys. Res. Lett.*, 45, 2022-2030.
46. Gu, Y., and **D. Li***, (2018): A modeling study of the sensitivity of urban heat islands to precipitation at climate scales. *Urban Climate*. 24, 982-993.
47. Zhu, X. L., **D. Li**, W. Y. Zhou, G. H. Ni, Z. T. Cong, and T. Sun*, (2017): An idealized LES study of urban modification of moist convection. *Q J R Meteorol Soc*, 143, 3228-3243.
48. Ting, S.*, K. Simone, **D. Li**, H. C. Ward, Z. Q. Gao, G. H. Ni, and C. S. B. Grimmond, (2017): Attribution and mitigation of heat wave-induced urban heat storage change. *Environ. Res. Lett.*, 12, 114007.
49. Hu, X.*, J. Wu, P. Chen, T. Sun, and **D. Li**, (2017): Impact of climate variability and change on crime rates in Tangshan, China. *Sci Total Environ*, 609, 1041-1048.
50. Rigden, A., and **D. Li***, (2017): Attribution of surface temperature anomalies induced by land use and land cover changes. *Geophys. Res. Lett.*, 44, 6814-6822.
51. **Li, D.***, and G. G. Katul, (2017): On the linkage between the $k^{-5/3}$ spectral and $k^{-7/3}$ cospectral scaling in high-Reynolds number turbulent boundary layers. *Phys. Fluids*, 29.
52. **Li, D.***, A. Rigden, G. Salvucci, and H. P. Liu, (2017): Reconciling the Reynolds number dependence of scalar roughness length and laminar resistance. *Geophys. Res. Lett.*, 44, 3193-3200.
53. Hu, X.*, P. Chen, H. Huang, T. Sun, and **D. Li**, (2017): Contrasting impacts of heat stress on violent and nonviolent robbery in Beijing, China. *Nat Hazards*, 87, 961-972.
54. Wang, J. A.*, L. R. Hutyrá, **D. Li**, and M. A. Friedl, (2017): Gradients of Atmospheric Temperature and Humidity Controlled by Local Urban Land-Use Intensity in Boston. *J Appl Meteorol Clim*, 56, 817-831.
55. Zhang, Y. J., Z. Q. Gao*, Z. T. Pan, **D. Li**, and X. H. Huang, (2017): Spatiotemporal variability of extreme temperature frequency and amplitude in China. *Atmos. Res.*, 185, 131-141.
56. **Li, D.***, G. G. Katul and S. Zilitinkevich (2016), Closure Schemes for Stably Stratified Atmospheric Flows without Turbulence Cutoff, *J Atmos. Sci.* 73, 4817–4832, doi: 10.1175/JAS-D-16-0101.1.
57. Parolari, A.*, **D. Li**, E. Bou-Zeid, G. Katul, and A. Shmuel (2016) Climate, not conflict, explains extreme Middle East dust storm, *Environ. Res. Lett.* 11, 114013.
58. Zhu, X. L., G. Ni, Z. Cong, T. Sun*, and **D. Li** (2016), Impacts of surface heterogeneity on dry planetary boundary layers in an urban-rural setting, *J. Geophys. Res. Atmos.* 121, 12,164–12,179
59. **Li, D.***, T. Sun, M. Liu, L. Wang, and Z. Gao (2016), Changes in Wind Speed under Heat Waves Enhance Urban Heat Islands in Beijing Metropolitan Area, *J. Appl. Meteorol. Climatol.* 55, 2369-2375.
60. Zhou, D.C.*, **D. Li**, G. Sun, L. Zhang, Y. Liu, and L. Hao (2016), Contrasting Effects of Urbanization and Agriculture on Surface Temperature in Eastern China, *J Geophys Res. Atmos*, 121, 9597-9606.
61. **Li, D.*** (2016), Revisiting the Subgrid-Scale Prandtl Number for Large-Eddy Simulation, *J. Fluid Mech.* DOI:

<http://dx.doi.org/10.1017/jfm.2016.472>.

62. Zhou, D.C.*, L. Zhang, **D. Li**, D. Huang and C Zhu (2016), Climate–Vegetation Control on the Diurnal and Seasonal Variations of Surface Urban Heat Islands in China, *Environ. Res. Lett.*, 11 (7), 074009.
63. Katul, G.G.*, **D. Li**, H. Liu, and S. Assouline (2016), Deviations from Unity of the Ratio of the Turbulent Schmidt to Prandtl Numbers in Stratified Atmospheric Flows over Water Surfaces, *Physical Review Fluids*, 1, 034401.
64. **Li, D.***, S. Salesky, T. Banerjee (2016), Connections Between the Ozmidov Scale and Mean Velocity Profile in Stably Stratified Atmospheric Surface Layers, *J. Fluid Mech.* DOI: <http://dx.doi.org/10.1017/jfm.2016.311>.
65. **Li, D.***, S. Malyshev, E. Shevliakova (2016), Exploring Historical and Future Urban Climate in the Earth System Modeling Framework: 1. Model Development and Evaluation. *J Adv Model Earth Syst.*, 8, 917–935, doi:10.1002/2015MS000578.
66. **Li, D.***, S. Malyshev, E. Shevliakova (2016), Exploring Historical and Future Urban Climate in the Earth System Modeling Framework: 2. Impact of Urban Land Use over the Continental United States. *J Adv Model Earth Syst.*, 8, 936–953. doi:10.1002/2015MS000579.
67. Assouline, S., **D. Li***, S. Tyler, J. Tanny, S. Cohen, E. Bou-Zeid, M. Parlange, G. Katul (2016), On the Variability of the Priestley-Taylor Coefficient over Water Bodies. *Water Resour. Res.*, DOI: 10.1002/2015WR017504
68. Zhang, Y., Z. Pan, Z. Gao*, **D. Li** and B. Wan (2016), Record-Breaking Temperatures in China During the Warming and Recent Hiatus Periods, *J. Geophys. Res. Atmos.*, DOI: 10.1002/2015JD023886.
69. Ramamurthy P.*, **D. Li**, E. Bou-Zeid (2016), High-Resolution Simulation of Heatwave Events in New York City. *Theor. Appl. Climatol.* 1-14
70. **Li, D.***, G. Katul, and P. Gentile (2016), The k^{-1} Scaling of Air Temperature Spectra in Atmospheric Surface Layer Flows, *Q. J. Roy. Meteor. Soc.* doi: 10.1002/qj.2668.
71. Banerjee, T.*, **D. Li** , J-Y Juang, G. Katul (2016), A Spectral Budget Model for the Longitudinal Turbulent Velocity in the Stable Atmospheric Surface Layer. *J Atmos Sci.* 73, 145–166.
72. **Li, D.***, G. G. Katul, and E. Bou-Zeid (2015), Turbulent Energy Spectra, Momentum and Heat Flux Co-spectra in Stable Atmospheric Surface Layers, *Bound. Layer Meteorol.*, 157(1), 1-21
73. Sun, K., **D. Li***, L. Tao, Z. Zhao, and M. A. Zondlo (2015), Quantifying the Influence of Random Errors in Turbulence Measurements on Scalar Similarity in the Atmospheric Surface Layer, *Bound. Layer Meteorol.*, 157(1), 61-80
74. **Li, D.***, G. G. Katul and S. Zilitinkevich (2015), Revisiting the Turbulent Prandtl Number in an Idealized Atmospheric Surface Layer, *J Atmos. Sci.* 72, 2394–2410.
75. **Li, D.**, T. Sun*, M. Liu, L. Yong, Z. Gao, L. Wang (2015), Contrasting Responses Of Urban And Rural Surface Energy Budgets To Heat Waves Explain Synergies Between Urban Heat Islands And Heat Waves, *Environ. Res. Lett.*, 10, 054009
76. Zhang, N., Z. Gao*, **D. Li** and Y. Liu (2015), Sensitivity of Climate Models to the Critical Richardson Number in the Boundary Layer Parameterization, *J. Geophys. Res. Atmos.*, 120, 3310-3328.
77. Li, Y., Z. Gao*, **D. Li.**, F. Chen, Y. Yang, L. Sun (2015), An Update Of Non-Iterative Solutions For Surface Fluxes Under Unstable Conditions, *Bound. Layer Meteorol.*, 156(3), 501-511

78. Chen, C., **D. Li**, Z. Gao*, J. Tang, Y. Gao, X. Guo, L. Wang, and B. Wan (2015), Seasonal And Inter-Annual Variations Of Sensible Heat, Water Vapor And CO₂ Fluxes Over A Rice-Wheat Rotation System In North China Plain, *Adv. Atmos. Sci.* 32(10), 1365-1380
79. Yang, W., **D. Li**, T. Sun*, and G. H. Ni (2015), Saturation-excess and Infiltration-excess Runoff on Green Roofs, *Ecol Eng*, 74, 327–336.
80. Cong, Z.*, X. Zhang, **D. Li**, H. Yang and D. Yang (2015), Understanding Hydrological Trends by Combining the Budyko Hypothesis and a Stochastic Soil Moisture model, *Hydrol. Sci. J.* 60(1), 145-55.
81. Wang, L., Z. Gao*, S. Miao, X. Guo, T. Sun, M. Liu, and **D. Li** (2015), Contrasting Characteristics of the Surface Energy Balance between the Urban and Rural Areas of Beijing, China, *Adv. Atmos. Sci.* 32(4) 505-14 .
82. **Li, D.***, and E. Bou-Zeid (2014), Quality and Sensitivity of High-resolution Numerical Simulation of Urban Heat Islands, *Environ. Res. Lett.*, 9(5), 055001.
83. **Li, D.***, E. Bou-Zeid, and M. Oppenheimer (2014), The Effectiveness of Cool and Green roofs as Urban Heat Island Mitigation Strategies, *Environ. Res. Lett.*, 9(5), 055002.
84. **Li, D.*** (2014), Assessing the Impact of Interannual Variability of Precipitation and Potential Evaporation on Evapotranspiration, *Adv. Water Resour.*, 70, 1-11.
85. Hu, X., **D. Li**, H. Huang*, S. Shen, and E. Bou-Zeid (2014), Modeling and Sensitivity Analysis of Transport and Deposition of Radionuclides From the Fukushima Daiichi Accident, *Atmos. Chem. Phys.*, 14, 11065-11092.
86. Wang, L., **D. Li***, Z. Gao, T. Sun, X. Guo, and E. Bou-Zeid (2014), Turbulent Transport of Momentum and Scalars Above an Urban Canopy, *Bound. Layer Meteorol.*, 150(3), 485-511.
87. Li, Y., Z. Gao*, **D. Li**, L. Wang, and H. Wang (2014), An Improved Non-iterative Surface Layer Flux Scheme for Atmospheric Stable Stratification Conditions, *Geosci. Model Dev.*, 7(2), 515-529.
88. Zhang, Y., Z. Gao*, **D. Li**, Y. Li, N. Zhang, X. Zhao and J. Chen (2014), On the Computation Of Planetary Boundary Layer Height Using the Bulk Richardson Number Method, *Geosci. Model Dev.*, 7, 2599-2611.
89. **Li, D.***, M. Pan, Z. T. Cong, L. Zhang, and E. Wood (2013), Vegetation Control on Water and Energy Balance Within the Budyko Framework, *Water Resour. Res.*, 49(2), 969-976.
90. **Li, D.***, and E. Bou-Zeid (2013), Synergistic Interactions Between Urban Heat Islands and Heat Waves: the Impact in Cities Is Larger Than the Sum of Its Parts, *J. Appl. Meteorol. Climatol.*, 52(9), 2051-2064.
91. **Li, D.***, E. Bou-Zeid, M. L. Baeck, S. Jessup, and J. A. Smith (2013), Modeling Land Surface Processes and Heavy Rainfall in Urban Environments: Sensitivity to Urban Surface Representations, *J. Hydrometeorol.*, 14(4), 1098-1118.
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93. Katul, G. G.*, **D. Li**, M. Chameki, and E. Bou-Zeid (2013), Mean Scalar Concentration Profile in a Sheared and Thermally Stratified Atmospheric Surface Layer, *Phys. Rev. E.*, 87(2), 023004.
94. Zhao, Z.*, Z. Gao, **D. Li**, X. Bi, C. Liu, and F. Liao (2013), Scalar Flux–Gradient Relationships Under Unstable Conditions over Water in Coastal Regions, *Bound. Layer Meteorol.*, 148(3), 495-516.
95. **Li, D.***, G. G. Katul, and E. Bou-Zeid (2012), Mean Velocity and Temperature Profiles in a Sheared Diabatic

Turbulent Boundary Layer, *Phys. Fluids*, 24(10).

96. **Li, D.***, E. Bou-Zeid, and H. De Bruin (2012), Monin–Obukhov Similarity Functions for the Structure Parameters of Temperature and Humidity, *Bound. Layer Meteorol.*, 145(1), 45-67.
97. **Li, D.**, and E. Bou-Zeid* (2011), Coherent Structures and the Dissimilarity of Turbulent Transport of Momentum and Scalars in the Unstable Atmospheric Surface Layer, *Bound. Layer Meteorol.*, 140(2), 243-262.

Conference Presentations (only including those given by me or my students)

1. **Li, D.**, K. Sun, Y. Zhang, S. Tao, 2021, *From Satellite Measurements of Trace Gases to Surface Applications: The Bridging Role of the Planetary Boundary Layer* (oral), American Meteorological Society Annual Meeting, online
2. Qin, Y., W. L. Liao, **D. Li**, 2021, Simulating and Attributing the Urban-Rural Contrasts of Temperature and Heat Stress (oral), American Meteorological Society Annual Meeting, online
3. Wang, L., M. Y. Huang, **D. Li**, 2020, Where Should We Paint the Roof White? (oral), American Geophysical Union Fall Meeting, online
4. Wang, L., **D. Li**, 2020, Surface Urban Heat islands during Heat Waves: a Comparative Study between Boston and Phoenix (poster), American Geophysical Union Fall Meeting, online
5. **Li, D.**, L. Wang, 2020, Land use and land cover change impact on surface temperature: the scale issue (oral), European Geosciences Union General Assembly, online
6. Wang, L., M. Y. Huang, **D. Li**, 2020, Modeling the impacts of urban green and cool roofs on surface climate (oral), American Meteorological Society Annual Meeting, Boston, MA
7. Wang, L., **D. Li**, 2020, Contrasting responses of urban and forest surface temperatures to heat waves (poster) American Meteorological Society Annual Meeting, Boston, MA
8. **Li, D.**, 2020, Land Use and Land Cover Change–Induced Surface Temperature Anomalies: The Scale Issue (poster), American Meteorological Society Annual Meeting, Boston, MA
9. **Li, D.**, W. L. Liao, 2019, The urban-rural contrast of heat stress in a global earth system model (oral), American Geophysical Union Fall Meeting, San Francisco
10. Wang, L., M. Y. Huang, **D. Li**, 2019, Modeling the impacts of urban green and cool roofs on surface climate (oral), 2019 Community Earth System Model Workshop, Boulder, CO
11. Wang, L., **D. Li**, 2019, Contrasting responses of urban and forest surface temperatures to heat waves (poster), joint WRF and MPAS users' workshop 2019, Boulder, CO
12. **Li, D.**, P. Wang, W. L. Liao, 2019, *Contrasting evaporative responses of ecosystems to heat waves traced to the roles of vapor pressure deficit and canopy resistance* (oral), American Meteorological Society Annual Meeting, Phoenix, AZ.
13. **Li, D.**, W. L. Liao, 2018, *Interpreting urban heat islands as perturbations on surface energy and water balances* (oral), American Geophysical Union Fall Meeting, Washington D.C.
14. **Li, D.**, L. Wang, 2018, *Scale issue in the attribution of land use and land cover change-induced surface temperature anomalies* (poster), American Geophysical Union Fall Meeting, Washington D.C.
15. **Li, D.**, G. Katul, H. Liu, 2018, *Intrinsic Constraints on Asymmetric Turbulent Transport of Scalars Within the Constant Flux Layer of the Lower Atmosphere* (poster), American Geophysical Union Fall Meeting, Washington D.C.
16. **Li, D.**, Y. J. Zhang, Z. K. Lin, L. Wang, J. Santanello, 2018, *Characterizing diurnal variations of the PBL with Aircraft Meteorological Data Reports* (oral), NASA Sounder Science Team Meeting, Washington D.C.

17. Wang, L., D. Li, 2018, *Attribution of heat wave-induced urban boundary layer warming* (poster), 10th International Conference on Urban Climate/14th Symposium on the Urban Environment, New York, NY
18. Li, D., W. L. Liao, 2018, *Urban heat islands: roughness or imperviousness?* (oral), 10th International Conference on Urban Climate/14th Symposium on the Urban Environment, New York, NY
19. Li, D., Y. J. Zhang, Z. K. Lin, L. Wang, 2018, *Characterizing urban boundary layer structures under heat waves* (oral), 10th International Conference on Urban Climate/14th Symposium on the Urban Environment, New York, NY
20. Wang, L., D. Li, 2018, *Attribution of heat wave-induced urban boundary layer warming* (poster), American Meteorological Society's 23rd Symposium on Boundary Layers and Turbulence, Oklahoma City, OK
21. Li, D., Y. J. Zhang, Z. K. Lin, L. Wang, 2018, *Developing a Data Record of PBL Temperature Profiles for Diurnal Land-Atmosphere Coupling Investigations* (oral), American Meteorological Society's 23rd Symposium on Boundary Layers and Turbulence, Oklahoma City, OK
22. Li, D., L. Wang, 2018, *Attribution of heat wave-induced urban boundary layer warming* (oral), 8th GEWEX Science Conference, Canmore, Canada
23. Li, D., A. Rigden., G. Salvucci, H. Liu, 2017, *Reconciling the Reynolds number dependence of scalar roughness length and laminar resistance* (oral), American Geophysical Union Fall Meeting, New Orleans, LA.
24. Li, D., Yaofeng, G., 2016, *A large-scale sensitivity study of urban heat islands using GFDL's earth system model* (oral), American Geophysical Union Fall Meeting, San Francisco, CA.
25. Li, D., A. Rigden, 2016, *Overestimated surface roughness impact on land use/land cover change induced temperature anomaly* (oral), American Geophysical Union Fall Meeting, San Francisco, CA.
26. Li, D., T. Sun, L. Wang, and Z. Gao, 2016, *Contrasting responses of urban and rural surface energy budgets to heat waves* (oral), the 22nd Symposium on Boundary Layers and Turbulence, Salt Lake City, Utah.
27. Li, D., E. Shevliakova, S. Malyshev, L. Harris, and S.J. Lin, 2015, *Impacts and feedbacks of urbanization on regional hydroclimate: a case study with a high-resolution GFDL AGCM* (oral), American Geophysical Union Fall Meeting, San Francisco, CA.
28. Li, D., G. Katul, and P. Gentine, 2015, *On the k^{-1} scaling of air temperature spectra in atmospheric surface layer flows* (poster), American Geophysical Union Fall Meeting, San Francisco, CA.
29. Li, D., E. Shevliakova, S. Malyshev, and S.J. Lin, 2015, *Towards understanding the hydro-climatic implications of urbanization in the GFDL global climate and earth system modeling framework* (oral), 9th International Conference on Urban Climate, Toulouse, France.
30. Li, D., E. Shevliakova, S. Malyshev, and S.J. Lin, 2014, *Towards understanding implications of urbanization for regional and global climate in the GFDL Earth System Modeling framework* (oral), American Geophysical Union Fall Meeting, San Francisco, CA.
31. Li, D., G. Katul, and E. Bou-Zeid, 2014, *The evolution of turbulent energy spectra, heat and momentum flux co-spectra in the stable atmospheric surface layer* (oral), American Geophysical Union Fall Meeting, San Francisco, CA.
32. Li, D., E. Shevliakova, S. Malyshev, and S.J. Lin, 2014, *Urbanizing GFDL's global climate models* (oral), European Geosciences Union General Assembly, Vienna, Austria
33. Li, D., and E. Bou-Zeid, 2014, *Heat Waves in Urban Areas: the Hot is Getting Hotter* (oral), 2014 American Meteorological Society Annual Meeting, Atlanta, GA
34. Li, D., E. Bou-Zeid, M. Barlage, F. Chen, and J. A. Smith, 2013, *Development and evaluation of a mosaic approach in the WRF-Noah framework* (oral), the 14th WRF Users' Workshop, Boulder, CO
35. Li, D., E. Bou-Zeid, M.L. Baeck, S. Jessup and J.A. Smith, 2012, *Hydrometeorological and Microclimatic Impacts of Urbanization* (poster), American Geophysical Union Fall Meeting, San Francisco, CA.

36. Li, D., and E. Bou-Zeid, 2012, *Urban Heat Island: Modeling, Sensing and Mitigation Strategies (oral)*, the 20th Symposium on Boundary Layers and Turbulence, Boston, MA.
37. Li, D., G. Katul, and E. Bou-Zeid, 2012, *On the Dissimilarity of Turbulent Transport of Momentum and Scalars (poster)*, the Brutsaert – Parlange Hydrologic Meeting, Ithaca, NY.
38. Li, D., and E. Bou-Zeid, 2011, *The Role of Stability in Modulating the Structure and Transport Efficiency of Turbulence in the Atmospheric Surface Layer (oral)*, the 64th Annual Meeting of the APS Division of Fluid Dynamics, Baltimore, MD.
39. Li, D., and E. Bou-Zeid, 2011, *On the Dissimilarity of Turbulent Transport of Momentum and Scalars (poster)*, Conference on Coherent Flow Structures in Geophysical Flows at Earth's Surface, Vancouver, BC, Canada
40. Li, D., and E. Bou-Zeid, 2010, *Coherent Structures and the Dissimilarity of Turbulent Transport of Momentum and Scalars (oral)*, American Geophysical Union Fall Meeting, San Francisco, CA.

Invited Talks

1. Li, D., 2021, *Biophysical impacts of land-use/land-cover changes: a simple surface energy balance model and the roles of convective heat transfer and boundary layer feedback*, Program in Atmospheres, Oceans and Climate, MIT, Boston, US
2. Li, D., 2020, *Perturbing the land-ABL system*, Karlsruhe Institute of Technology, Karlsruhe, Germany
3. Li, D., 2020, *Perturbing the land-ABL system*, Max Planck Institute for Dynamics and Self-Organization, Göttingen, Germany
4. Li, D., 2019, *Extreme heat in cities: synergies between urban heat islands and heat waves*, NOAA Earth System Sciences and Modeling Community Workshop on Extreme Heat, Washington D.C.
5. Li, D., 2019, *Urban Heat Islands: new perspectives on an old topic*, Department of Civil and Environmental Engineering, Princeton University, Princeton, NJ
6. Li, D., 2019, *Urban Heat Islands: new perspectives on an old topic*, Department of Civil and Environmental Engineering, University of Connecticut, Storrs, CT
7. Li, D., 2019, *Urban Heat Islands: new perspectives on an old topic*, Department of Civil, Structural, and Environmental Engineering, University of Buffalo, Buffalo, NY
8. Li, D., 2019, *From Global Climate Change to Local Policy Decisions*, Boston University Academy, Boston, MA
9. Li, D., 2018, *Urban Climate Modeling: From Simulation to Understanding*, School of Hydrology and Water Resources, Nanjing University of Information Science & Technology, Nanjing, China
10. Li, D., 2018, *Urban Climate Modeling: From Simulation to Understanding*, Department of Atmospheric Sciences, Nanjing University, Nanjing, China
11. Li, D., 2018, *Urban Climate Modeling: From Simulation to Understanding*, Pacific Northwest National Laboratory, Richland, WA
12. Li, D., 2018, *Urban Heat Islands*, Global Synthesis on Budyko's Framework - Powell Center Meeting, Fort Collins, CO
13. Li, D., 2017, *Turbulent transport of momentum and heat in the atmospheric boundary layer: new perspectives on an old subject*, Department of Civil and Environmental Engineering, Washington State University, Pullman, WA.
14. Li, D., 2017, *The Fluid Mechanics of Surface-Atmosphere Interaction*, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China.
15. Li, D., 2017, *The Fluid Mechanics of Surface-Atmosphere Interaction*, International Pacific Research Center,

University of Hawaii at Manoa, Honolulu, HI.

16. Li, D., G. Katul, 2016, *Connecting macroscopic flow properties with turbulent energy spectra in stratified atmospheric surface layers*, American Geophysical Union Fall Meeting, San Francisco, CA.
17. Li, D., 2016, *From Global Climate Change to Local Policy Decisions*, Environmental Volunteering Outreach Group -Branch Out, Boston University, Boston, MA.
18. Li, D., 2016, *From Global Climate Change to Local Policy Decisions*, Hariri Institute for Computing and Computational Science and Engineering, Boston University, Boston, MA.
19. Li, D., 2016, *Hydrology meets turbulence over lakes*, Department of Hydraulic Engineering, Tsinghua University, Beijing, China.
20. Li, D., 2016, *Hydrology meets turbulence over lakes*, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China.
21. Li, D., 2016, *Hydrology meets turbulence over lakes*, College of Global Change and Earth System Science, Beijing Normal University, Beijing, China.
22. Li, D., 2016, *Turbulence in land-atmosphere coupling*, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China.
23. Li, D., 2015, *Contrasting responses of urban and rural surface energy budgets to heat waves*, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China.
24. Li, D., 2015, *Monin-Obukhov Similarity Theory: A new perspective on an old topic*, Center for Earth System Science, Tsinghua University, Beijing, China
25. Li, D., 2015, *Monin-Obukhov Similarity Theory: A new perspective on an old topic*, Department of Atmospheric Sciences, Peking University, Beijing, China
26. Li, D., 2015, *Monin-Obukhov Similarity Theory: A new perspective on an old topic*, Department of Atmospheric Sciences, University of Miami, Miami, FL
27. Li, D., 2015, *Monin-Obukhov Similarity Theory: A new perspective on an old topic*, Department of Atmospheric and Oceanic Sciences, University of California at Los Angeles, Los Angeles, CA
28. Li, D., 2015, *Monin-Obukhov Similarity Theory: A new perspective on an old topic*, Department of Earth and Planetary Sciences, University of California at Santa Cruz, Santa Cruz, CA
29. Li, D., 2015, *Towards urban sustainability under a changing climate*, Department of Earth and Planetary Sciences, University of California at Santa Cruz, Santa Cruz, CA
30. Li, D., 2015, *Towards urban sustainability under a changing climate*, Department of Earth and Environment, Boston University, Boston, MA
31. Li, D., 2014, *Towards urban sustainability under a changing climate*, Earth System Science Programme, Chinese University of Hong Kong, Hong Kong, China
32. Li, D., T. Sun, and E. Bou-Zeid, 2014, *Heat Waves in Urban Environments*, Urban Environmental Pollution 2014 conference, Toronto, Canada
33. Li, D., 2014, *Climate extremes in the built environment: how to achieve urban sustainability under a changing climate*, School of Marine and Atmospheric Sciences, Stony Brook University, Stony Brook, NY
34. Li, D., 2014, *Climate extremes in the built environment: how to achieve urban sustainability under a changing climate*, Department of Earth and Environmental Engineering, Columbia University, New York, NY
35. Li, D., 2014, *Climate extremes in the built environment: how to achieve urban sustainability under a changing climate*, Department of Atmospheric Sciences, UIUC, Champaign, IL
36. Li, D., 2014, *Climate extremes in the built environment: how to achieve urban sustainability under a changing climate*, Department of Civil and Environmental Engineering, Duke University, Durham, NC
37. Li, D., 2014, *Climate extremes in the built environment: how to achieve urban sustainability under a changing climate*

climate, Department of Civil and Environmental Engineering, MIT, Boston, MA

38. Li, D., 2013, *Urban sustainability under a changing climate*, Geophysical Fluid Dynamics Laboratory, Princeton, NJ
39. Li, D., 2013, *How to include the heterogeneity effect in modeling urban surface?*, Shanghai Typhoon Institute, China Meteorological Administration, Shanghai, China
40. Li, D., 2013, *How to include the heterogeneity effect in modeling urban surface?*, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China.
41. Li, D., 2013, *Surface-atmosphere interaction: the impact of buoyancy*, Department of Hydraulic Engineering, Tsinghua University, Beijing, China
42. Li, D., 2013, *Dissimilarity between turbulent transport of momentum and temperature: implication for the mean profiles*, Guangzhou Institute of Tropical and Marine Meteorology, China Meteorological Administration, Shanghai, China
43. Li, D., 2013, *Land-atmosphere interactions over urban terrain*, Pacific Northwest National Laboratory, Richland, WA.
44. Li, D., 2011, *On the Dissimilarity of Turbulent Transport of Momentum and Scalars*, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China.
45. Li, D., 2010, *Turbulent Transport: New Perspectives on an Old Subject*, Department of Hydraulic Engineering, Tsinghua University, Beijing, China.

Teaching

- 2021 Fall, Urban Climate, Boston University
- 2021 Spring, Introduction to Hydrology, Boston University
- 2020 Fall, Urban Climate, Boston University
- 2019 Fall, Urban Climate, Boston University
- 2019 Spring, Introduction to Hydrology, Boston University
- 2018 Fall, Geodynamics: Fluids and Fluid Transport, Boston University
- 2018 Spring, Introduction to the Atmospheric Boundary Layer & Biogeosciences Practicum, Boston University
- 2017 Fall, Biogeosciences Colloquium, Boston University
- 2017 Spring, Introduction to Hydrology, Boston University
- 2016 Fall, Geodynamics: Fluids and Fluid Transport, Boston University
- 2016 Spring, Introduction to the Atmospheric Boundary Layer, Boston University

Mentoring

- Postdocs: Linying Wang (2019-current); Emmanuel Akinlabi (2020-current)
- Ph.D. students: Liang Wang (2017-2021); Yue Qin (2019-current); Heng Yu (2021-current)
- Master students: Shivani Ehrenfeucht (2016-2018)
- Part-time researchers: Zekun Lin (2017-2018); Qianning Qin (2019); Shiqi Tao (2019-2020)
- Undergraduate researchers: Andrew Pineda (2016); Yaofeng Gu (2016-2017)
- Visiting students/scholars: Xiaoliang Zhu (2016-2017); Yanzhao Zhou (2017); Weilin Liao (2017-2018); Peng Wang (2017-2018); Yuanjie Zhang (2017-2018); Li Feng (2018-2019); Zhi Qiao (2018-2019); Yue Xing (2019); Yong Li (2020)

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- Ph.D. committees: Minkyu Moon (graduated in 2020), Chi Chen (graduated in 2020), Xiaohe Zhang (graduated in 2020), Emily Chua, Anthony Wong, Xiaohui Zhu, Taylor Adams, Yasmin Romitti, Yingtong Zhang, Arden Radford

Grants

- Urban climate modeling in the Integrated Multi-sector, Multi-scale Modeling framework Phase 2 (sole PI, \$600,794), DOE/PNNL, 11/2020-9/2024
- Observational data-driven surface concentrations derived from satellite columns and aircraft profiles (Co-PI, \$164,523 to BU), NASA, 5/2019-5/2022
- Collaborative Research: The Role of Coherent Structures in Scalar Transport over Heterogeneous Landscapes (PI, \$306,191 to BU), NSF, 6/2019-5/2022
- Collaborative Research: PREEVENTS Track 2: Land-atmosphere feedbacks over urban terrain under heat waves (PI, \$680,273 to BU), NSF, 6/2019-5/2022
- Advancing theory and modeling of land-atmosphere coupling over heterogeneous urban terrain (sole PI, \$359,801), DOD/ARO, 9/2018-8/2021
- Urban climate modeling in the Integrated Multi-sector, Multi-scale Modeling framework (sole PI, \$245,233), DOE/PNNL, 11/2018-10/2020
- Revolutionizing Flow, Heat, and Dispersion Predictions over Complex Urban Environments (PI, \$28,288), BU-Hariri Center, 6/2019-6/2021
- Observing and modeling urban boundary layers under heat waves (PI, \$10,000), BU-Initiative on Cities, 6/2018-5/2019
- Mitigation of Boston heat island effect with urban canopy (co-PI, \$30,000), BU-Pardee Center, 9/2018-8/2020
- Coupled human-natural dynamics in urban heat islands: From big data to local policies (co-PI, \$27,000), BU-Hariri Center, 1/2016-12/2016

Community Services

- 2021.9 - current, Associate Editor, Journal of the Atmospheric Sciences
- 2020/2019/2018, session convener and chair, Boundary Layer Processes and Turbulence, American Geophysical Union Fall Meeting
- 2020/2019/2018, session convener and chair, Advances in Understanding Impacts of Land Use and Land Cover Change Using Earth System Models and Data Records, American Geophysical Union Fall Meeting
- 2019, session convener and chair, Advances in Understanding Land–Atmosphere Interactions, American Meteorological Society Annual Meeting
- 2019, session convener, Urban Ecohydrology: understanding urban-natural systems for the design of future cities, European Geophysical Union Annual Meeting
- 2018, session chair, American Meteorological Society’s 23rd Symposium on Boundary Layers and Turbulence
- 2018, session chair, 10th International Conference on Urban Climate/14th Symposium on the Urban

Environment

- 2017, Chair, Outstanding Student Paper Award Committee, Global Environmental Change Section, American Geophysical Union
- 2016, Member, Outstanding Student Paper Award Committee, Global Environmental Change Section, American Geophysical Union

University Services

- 2020-current, Inclusion and Diversity Committee, Department of Earth and Environment, Boston University
- 2021, URBAN Research & Travel Award Committee, URBAN Program, Boston University
- 2020, Student Award Committee, Biogeoscience Program, Boston University
- 2018, Ph.D. admission committee, Department of Earth and Environment, Boston University
- 2016, Student Award Committee, Biogeoscience Program, Boston University

Review

- Proposals (including panels): *US National Science Foundation, US Department of Energy, US Army Research Office, Research Grants Council of Hong Kong, German Federal Ministry of Education and Research*
- Journal articles: *Science, Science Advances, Nature Climate Change, Nature Communications, Agricultural and Forest Meteorology, Landscape and Urban Planning, Physics of Fluids, Hydrological Research Letters, Journal of Hydrology, PLOS ONE, Environmental Research Letters, Environmental Pollution, Urban Climate, International Journal of Climatology, Remote Sensing of Environment, Quarterly Journal of the Royal Meteorological Society, Geophysical Research Letters, Journal of Geophysical Research-Atmospheres, Water Resources Research, Journal of Climate, Journal of Atmospheric Sciences, Journal of Applied Meteorology and Climatology, Journal of Hydrometeorology, Journal of Atmospheric and Oceanic Technology, Boundary-Layer Meteorology, Hydrology and Earth System Sciences, Advances in Water Resources, Hydrological Processes, Hydrological Sciences Journal, Atmospheric Environment, Frontiers of Earth Science, Atmosphere, Journal of Arid Land, Advances in Atmospheric Sciences, Atmospheric and Oceanic Science Letters, Journal of Advances in Modeling Earth Systems*