

## Curriculum Vitae

### Elie Bou-Zeid, Associate Professor

Department of Civil & Environmental Engineering, Princeton University

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### Research Interests

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Environmental Fluid Mechanics & Turbulence, Boundary-Layer Meteorology, Urban Climatology & Hydrology, Surface-Atmosphere Interactions, Buoyancy Effects in Fluids, Wind Energy.

### Higher Education

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Ph.D. in Environmental Engineering, 2005

Johns Hopkins University, Baltimore, USA

*Dissertation: "Large Eddy Simulation of Atmospheric Boundary Layer Flow over Heterogeneous Surfaces"*

Master of Science in Mechanical Engineering, 2004

Johns Hopkins University, Baltimore, USA

Master of Engineering in Environmental and Water Resources Engineering, 2000

American University of Beirut, Beirut, Lebanon

*Dissertation: "Modeling Leachate Generation and Transport from Waste Disposal at a Former Quarry Site"*

Bachelor of Engineering in Mechanical Engineering, 1997

American University of Beirut, Beirut, Lebanon

### Professional Appointments

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Associate Professor, 2014 - ongoing

Princeton University, Department of Civil and Environmental Engineering, Princeton, USA

*Also since 2011: Associated Faculty in the Department of Mechanical and Aerospace Engineering*

Assistant Professor, 2008 – 2014

Princeton University, Department of Civil and Environmental Engineering, Princeton, USA

Postdoctoral Researcher, 2005 – 2008

Swiss Federal Institute of Technology - Lausanne, Environmental Fluid Mechanics Laboratory

Mechanical Engineer in Heating, Ventilation, and Air Conditioning (HVAC) contracting, July 1997 - October 1997, "Mechanical Engineering Office", Beirut, Lebanon

### Selected Honors and Awards

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Princeton Engineering Commendation for Outstanding Teaching, 2016

E. Lawrence Keyes Jr. / Emerson Electric Co. Faculty Advancement Award, the award "recognizes and assists promising junior faculty members" at Princeton University.

Prize of the “Fondation Latsis Internationale” for best research work across all fields at the Ecole Polytechnique Fédérale de Lausanne, Switzerland, 2009

Abel Wolman Graduate Fellowship, Johns Hopkins University, 2000

Dean’s Honor List, American University of Beirut, School of Engineering, 1997

### **Selected Professional Services and Activities**

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Deputy Chair, American Geophysical Union’s Technical Committee on “Large-Scale Field Experimentation”, July 1, 2010 – December 31, 2012

Member, American Meteorological Society’s “Boundary Layers and Turbulence” committee, February 1, 2012 – ongoing

Co-convenor of sessions on evapotranspiration measurement and modeling and boundary layer turbulence continuously from 2008 till 2014 at the American Geophysical Union Fall Meetings

Advisory board member for the “Integrating Chemistry and Earth Science” NSF-funded project to infuse Earth Sciences into the Chemistry Curriculum of Baltimore City high schools

Director, Program in Environmental Engineering and Water Resources, Princeton University, 2017-ongoing

Chair of the Organizing Committee for Princeton’s School of Engineering and Applied Science “Metropolis Initiative” 2016-ongoing

Member, Princeton Environmental Institute Advisory Committee, 2016-ongoing

Member, the Tiger Challenge advisory group (a co-curricular program designed to empower students to tackle complex issues and develop innovations using Design Thinking)

Member, the Princeton Campus Plan OIT advisory committee

Faculty Fellow, Princeton Energy and Climate Scholars (PECS) student group, 2012-ongoing

Academic co-chair, “Princeton Sustainability Committee”, tasked with improving the operational sustainability of the university and promoting the use of “campus-as-a-lab”, 2010-2014

Member, “Committee on Diversity” of Princeton’s Civil and Environmental Engineering Department

### **Short-Term Visiting Appointments**

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Visiting Scholar (during sabbatical year), September 2014 – January 2015  
Carnegie Mellon University, Department of Civil and Environmental Engineering, Pittsburgh, USA

Visiting Scholar (during sabbatical year), January–April 2015  
University of Melbourne, Department of Mechanical Engineering, Melbourne, Australia

Visiting Scholar (during sabbatical year), May – August 2015  
University of British Columbia, Faculty of Applied Science, Vancouver, Canada

## Published Journal Papers (Refereed)

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1. Caulton D. R., Li Q., Bou-Zeid E., Lu J., Lane H. M., Fitts J. P., Buchholz B., Golston L. M., Guo X., McSpirtt J., Pan D., Wendt L., and Zondlo, M. A. (2018) "Improving Mobile Platform Gaussian-Derived Emission Estimates Using Hierarchical Sampling and Large Eddy Simulation", *Atmospheric Chemistry and Physics Discussions*, DOI: [10.5194/acp-2017-961](https://doi.org/10.5194/acp-2017-961).
2. Lei Z., Oppenheimer M., Qing Z., Baldwin J., Ebi K., Bou-Zeid E.; Guan K., Liu X. (2018) "Interactions between urban heat islands and heat waves", *Environmental Research Letters*, accepted.
3. Li Q., Bou-Zeid E., Vercauteren N. Parlange M.B. (2018) "Signatures of Air-Wave Interactions over a Large Lake", *Boundary-Layer Meteorology*, accepted.
4. El-Samra R., Bou-Zeid E., El-Fadel M. (2018) "What Model Resolution is required in Climatological Downscaling over Complex Terrain?", *Atmospheric Research*, 203, 68–82, DOI: [10.1016/j.atmosres.2017.11.030](https://doi.org/10.1016/j.atmosres.2017.11.030).
5. El-Samra R. , Bou-Zeid E., El-Fadel M. "To What Extent Does High Resolution Dynamical Downscaling Improve the Representation of Climatic Extremes over an Orographically Complex Terrain?", *Theoretical and Applied Climatology*, published online, DOI: [10.1007/s00704-017-2273-8](https://doi.org/10.1007/s00704-017-2273-8).
6. Momen M., Zheng Z., Bou-Zeid E. Stone H.A. (2017) "Inertial gravity currents produced by fluid drainage from an edge", *Journal of Fluid Mechanics*, 827, 640-663, DOI: [10.1017/jfm.2017.480](https://doi.org/10.1017/jfm.2017.480).
7. Malings C., Pozzi M., Klima K., Bergés M., Bou-Zeid E., Ramamurthy P. (2017) "Surface Heat Assessment for Developed Environments: Probabilistic Urban Temperature Modeling", *Computers, Environment and Urban Systems*, 66, 53-64, DOI: [10.1016/j.compenvurbsys.2017.07.006](https://doi.org/10.1016/j.compenvurbsys.2017.07.006).
8. Momen M. and Bou-Zeid E. (2017) "Analytical reduced models for the non-stationary diabatic atmospheric boundary layer", *Boundary-Layer Meteorology*, 164, 383-399, DOI: [10.1007/s10546-017-0247-0](https://doi.org/10.1007/s10546-017-0247-0).
9. Llaguno-Munitxa M., Bou-Zeid E., Hultmark M. (2017) "The influence of building geometry on street canyon air flow: validation of large eddy simulations against wind tunnel experiments", *Journal of Wind Engineering & Industrial Aerodynamics*, 165, 115-130. DOI: [10.1016/j.jweia.2017.03.007](https://doi.org/10.1016/j.jweia.2017.03.007).
10. El-Samra R., Bou-Zeid E., Bangalath H.K., Stenchikov G., El-Fadel M. (2017) "Future intensification of hydro-meteorological extremes: downscaling using the weather research and forecasting model", *Climate Dynamics*, 49, 3765–3785, DOI: [10.1007/s00382-017-3542-z](https://doi.org/10.1007/s00382-017-3542-z).
11. Hezaveh S.H., Bou-Zeid E., Lohry M.W., Martinelli L. (2017) "Simulation and wake analysis of a single vertical axis wind turbine", *Wind Energy*, 20, 713–730, DOI: [10.1002/we.2056](https://doi.org/10.1002/we.2056).
12. Ramamurthy P., Li D. , Bou-Zeid E. (2017) "High-resolution Simulation of Heatwave Events in New York City", *Theoretical and Applied Climatology*, 128, 89–102, DOI: [10.1007/s00704-015-1703-8](https://doi.org/10.1007/s00704-015-1703-8).
13. Momen M. and Bou-Zeid E. (2017) "Mean and turbulence dynamics in unsteady Ekman boundary layers", *Journal of Fluid Mechanics*, 816, 209-242, DOI: [10.1017/jfm.2017.76](https://doi.org/10.1017/jfm.2017.76).

14. Salesky S. T., Chamecki M., Bou-Zeid E. (2017) "On the nature of the transition between roll and cellular organization in the convective boundary layer", *Boundary-Layer Meteorology*, 163, 41-68, DOI: [10.1007/s10546-016-0220-3](https://doi.org/10.1007/s10546-016-0220-3).
15. Williams O., Hohman T., Van Buren T., Bou-Zeid E., Smits A.J. (2017) "The effect of stable thermal stratification on turbulent boundary layer statistics", *Journal of Fluid Mechanics*, 812, 1039-1075, DOI: [10.1017/jfm.2016.781](https://doi.org/10.1017/jfm.2016.781).
16. Ramamurthy P. and Bou-Zeid E. (2017) "Heatwaves and urban heat islands: a comparative analysis of multiple cities using a high-resolution numerical model", *Journal of Geophysical Research-Atmosphere*, 122, 168-178, DOI: [10.1002/2016JD025357](https://doi.org/10.1002/2016JD025357).
17. Wang W., Smith J.A., Ramamurthy P., Baeck M.L., Bou-Zeid E., Scanlon T.M.(2017) "On the correlation of water vapor and CO<sub>2</sub> : Application to flux partitioning of evapotranspiration", *Water Resources Research*, 52, 9452–9469, DOI: [10.1002/2015WR018161](https://doi.org/10.1002/2015WR018161).
18. Yang J., Wang Z., Li Q., Vercauteren N., Bou-Zeid E., Parlange M.B. (2017) "A novel approach for unraveling the energy balance of water surfaces with a single depth temperature measurement", *Limnology and Oceanography*, 62, 89–103, DOI: [10.1002/lno.10378](https://doi.org/10.1002/lno.10378).
19. Parolari A., Li D., Bou-Zeid E., Katul G., Assouline S., (2016) "Climate, not conflict, explains extreme Middle East dust storm", *Environmental Research Letters*, 11, 114013. DOI: [10.1088/1748-9326/11/11/114013](https://doi.org/10.1088/1748-9326/11/11/114013).  
Featured in international media in [English](#), [Hebrew](#), and [Russian](#)
20. Ryu Y.H., Smith J.A., Baeck M.L., Cunha, L.K., Bou-Zeid E., Krajewski, W.(2016) "The Regional Water Cycle and Heavy Spring Rainfall in Iowa: Observational and Modeling Analyses from the IFloodS Campaign", *Journal of Hydrometeorology*, 17, 2763-2784, DOI: [10.1175/JHM-D-15-0174.1](https://doi.org/10.1175/JHM-D-15-0174.1).
21. Li Q., Bou-Zeid E., Anderson W., Grimmond S., Hultmark M. (2016)"Quality and Reliability of LES of Convective Scalar Transfer at High Reynolds Numbers", *International Journal of Heat and Mass Transfer*, 102, 959–970, DOI:[10.1016/j.ijheatmasstransfer.2016.06.093](https://doi.org/10.1016/j.ijheatmasstransfer.2016.06.093).
22. Bradshaw J., Bou-Zeid E, Harris R.H. (2016) "Greenhouse gas mitigation benefits and cost-effectiveness of weatherization treatments for low-income, American, urban housing stocks", *Energy and Buildings*, 128,911-920, DOI: [10.1016/j.enbuild.2016.07.020](https://doi.org/10.1016/j.enbuild.2016.07.020).
23. Kuehni S.M., Bou-Zeid E., Webb C., Shokri N. (2016), "Roof cooling by direct evaporation from a porous roof layer", *Energy and Buildings*, 127, 512-528, DOI: [10.1016/j.enbuild.2016.06.019](https://doi.org/10.1016/j.enbuild.2016.06.019).
24. Tomaszewicz M., Abou Najm M., Beysens D., Alameddine I., Bou Zeid E., El-Fadel M. (2016) "Projected climate change impacts upon dew yield in the Mediterranean basin", *Science of the Total Environment*, 566-567,1339-1348, DOI: [10.1016/j.scitotenv.2016.05.195](https://doi.org/10.1016/j.scitotenv.2016.05.195).
25. Li Q., Bou-Zeid E., Anderson W. (2016), "The impact and treatment of the Gibbs phenomenon in immersed boundary method simulations of momentum and scalar transport", *Journal of Computational Physics*, 10, 237–251, DOI: [10.1016/j.jcp.2016.01.013](https://doi.org/10.1016/j.jcp.2016.01.013).
26. Alameddine I., Abi Esber L., Bou Zeid E., Hatzopoulou M., El-Fadel M. (2016), "Operational and Environmental Determinants of In-Vehicle CO and PM2.5 Exposure", *Science of the Total Environment*, 551-552, 42-50, DOI: [10.1016/j.scitotenv.2016.01.030](https://doi.org/10.1016/j.scitotenv.2016.01.030).

27. Assouline S., Li D., Tyler S., Tanny J., Cohen S., Bou-Zeid E., Parlange M.B., Katul G.G. (2016) "On the variability of the Priestley-Taylor coefficient over water bodies", *Water Resources Research*, 52,150-163, [DOI: 10.1002/2015WR017504](https://doi.org/10.1002/2015WR017504).
28. Ryu Y.H., Bou-Zeid E., Wang Z.-H. Smith J.A. (2016) "Realistic representation of trees in an urban canopy model". *Boundary-Layer Meteorology*, 159,193-220, [DOI: 10.1007/s10546-015-0120-y](https://doi.org/10.1007/s10546-015-0120-y).
29. Momen M. and Bou-Zeid E. (2016) "Large Eddy Simulations and Damped-Oscillator Models of the Unsteady Ekman Boundary Layer", *Journal of the Atmospheric Sciences*, 73, 25-40, [DOI: 10.1175/JAS-D-15-0038.1](https://doi.org/10.1175/JAS-D-15-0038.1).
30. Ryu Y.H., Smith J.A., Bou-Zeid E., Baeck M.L. (2016) "The Influence of Land-Surface Heterogeneities on Heavy Convective Rainfall in the Baltimore-Washington Metropolitan Area", *Monthly Weather Review*, 144, 553-573, [DOI: 10.1175/MWR-D-15-0192.1](https://doi.org/10.1175/MWR-D-15-0192.1).
31. Katul G.G., Manes C., Porporato A., Bou-Zeid E., Chamecki M. (2015) "Bottlenecks in turbulent kinetic energy spectra predicted from structure function inflections using the Von Karman-Howarth equation" *Physical Review E*, 92, 033009, [DOI: 10.1103/PhysRevE.92.033009](https://doi.org/10.1103/PhysRevE.92.033009).
32. Li D., Katul G.G., Bou-Zeid E. (2015) "Turbulent energy spectra and cospectra of momentum and heat fluxes in the stable atmospheric surface layer", *Boundary-Layer Meteorology*, 157(1), 1-21, [DOI: 10.1007/s10546-015-0048-2](https://doi.org/10.1007/s10546-015-0048-2).
33. Ramamurthy P., Sun T. Rule K., Bou-Zeid E. (2015) "The Joint Influence of Albedo and Insulation on Roof Performance: A Modeling Study", *Energy and Buildings*, 102, 317-327, [DOI: 10.1016/j.enbuild.2015.06.005](https://doi.org/10.1016/j.enbuild.2015.06.005).
34. Ramamurthy P., Sun T. Rule K., Bou-Zeid E. (2015) "The Joint Influence of Albedo and Insulation on Roof Performance: An Observational Study", *Energy and Buildings*, 93, 249-258, [DOI: 10.1016/j.enbuild.2015.02.040](https://doi.org/10.1016/j.enbuild.2015.02.040).
35. Anderson W., Li Q., Bou-Zeid E. (2015) "Numerical simulation of flow over urban-like topographies and evaluation of turbulence temporal attributes", *Journal of Turbulence*, 16 (9), 809-831, [DOI: 10.1080/14685248.2015.1031241](https://doi.org/10.1080/14685248.2015.1031241).
36. Solecki W., Rosenzweig C., Blake R., de Sherbinin A., Matte T., Moshary F., Rosenzweig B., Arend M., Gaffin S., Bou-Zeid E., Rule K., Sweeny G., Dessy W. (2015) "New York City Panel on Climate Change 2015 Report Chapter 6: Indicators and Monitoring". *Annals of the New York Academy of Sciences*, 1336, 89–106, [DOI: 10.1111/nyas.12587](https://doi.org/10.1111/nyas.12587).
37. Ryu Y.H., Smith J.A., Baeck M.L., Bou-Zeid E. (2015) "On the Climatology of Precipitable Water and Water Vapor Flux in the Mid-Atlantic Region of the US". *Journal of Hydrometeorology*, 16, 70-87, [DOI: 10.1175/JHM-D-14-0030.1](https://doi.org/10.1175/JHM-D-14-0030.1).
38. Bou-Zeid E. (2015) "Challenging the large eddy simulation technique with advanced a posteriori tests". *Journal of Fluid Mechanics*, 764, 1-4, [DOI: 10.1017/jfm.2014.616](https://doi.org/10.1017/jfm.2014.616).
39. Shah S. and Bou-Zeid E. (2014) "Direct Numerical Simulations of Turbulent Ekman Layers with Increasing Static Stability: Modifications to the Bulk Structure and Second-Order Statistics". *Journal of Fluid Mechanics*, 760, 494-539, [DOI: 10.1017/jfm.2014.597](https://doi.org/10.1017/jfm.2014.597).

40. Shah S. and Bou-Zeid E. (2014) "Very-Large-Scale Motions in the Atmospheric Boundary Layer Educated by Snapshot Proper Orthogonal Decomposition". *Boundary-Layer Meteorology*, 153(3), 355-387, [DOI: 10.1007/s10546-014-9950-2](https://doi.org/10.1007/s10546-014-9950-2).
41. Hu X., Li D., Hong H., Shifei S., Bou-Zeid E. (2014) "Modeling and Sensitivity Analysis of Transport and Deposition of Radionuclides from the Fukushima Daiichi Accident". *Atmospheric Chemistry and Physics*, 14, 11065-11092, [DOI: 10.5194/acp-14-11065-2014](https://doi.org/10.5194/acp-14-11065-2014).
42. Ramamurthy P., Bou-Zeid E., Smith J.A., Wang Z., Baeck M.L., Saliendra N.Z., Hom J., Welty C. (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, [DOI: 10.1175/JAMC-D-13-0286.1](https://doi.org/10.1175/JAMC-D-13-0286.1).
43. Ramamurthy P. and Bou-Zeid E. (2014) "Contribution of Impervious Surfaces to Urban Evaporation". *Water Resources Research*, 50(4), 2889-2902, [DOI: 10.1002/2013WR013909](https://doi.org/10.1002/2013WR013909).
44. Li D. and Bou-Zeid E. (2014) "Quality and Sensitivity of High-Resolution Numerical Simulation of Urban Heat Islands". *Environmental Research Letters*, 9, 055001, [DOI: 10.1088/1748-9326/9/5/055001](https://doi.org/10.1088/1748-9326/9/5/055001).
45. Li D., Bou-Zeid E., Oppenheimer M. (2014) "The Effectiveness of Cool and Green Roofs as Urban Heat Island Mitigation Strategies". *Environmental Research Letters*, 9, 055002, [DOI: 10.1088/1748-9326/9/5/055002](https://doi.org/10.1088/1748-9326/9/5/055002) + [supplementary material](#).
46. Katul G.G., Porporato A., Shah S., Bou-Zeid E. (2014) "Two phenomenological constants explain similarity laws in stably stratified turbulence". *Physical Review E*, 89, 023007, [DOI: 10.1103/PhysRevE.89.023007](https://doi.org/10.1103/PhysRevE.89.023007).
47. Yang L., Smith J.A., Baeck M.L., Bou-Zeid E., Jessup S.M., Tian F., Hu H. (2014) "Impact of Urbanization on Heavy Convective Precipitation under Strong Large-Scale Forcing: A Case Study over the Milwaukee-Lake Michigan Region", *Journal of Hydrometeorology*, 15(1), 261-278, [DOI: 10.1175/JHM-D-13-020.1](https://doi.org/10.1175/JHM-D-13-020.1).
48. Sun T., Bou-Zeid E., Ni G.-H. (2014) "To Irrigate or not to Irrigate: Analysis of Green Roof Performance via a Vertically-Resolved Hygrothermal Model". *Building and Environment*, 73, 127-137, [DOI: 10.1016/j.buildenv.2013.12.004](https://doi.org/10.1016/j.buildenv.2013.12.004).
49. Wang L., Li D., Gao Z., Sun T., Guo X., Bou-Zeid E. (2014) "Turbulent transport of momentum and scalars above an urban canopy". *Boundary-Layer Meteorology*, 150(3), 485-511, [DOI: 10.1007/s10546-013-9877-z](https://doi.org/10.1007/s10546-013-9877-z).
50. Bradshaw J., Bou-Zeid E., Harris R.H. (2014) "Comparing the effectiveness of weatherization treatments for low-income, American, urban housing stocks in different climates", *Energy and Buildings*, 69, 535-543, [DOI: 10.1016/j.enbuild.2013.11.035](https://doi.org/10.1016/j.enbuild.2013.11.035).
51. Li D., Bou-Zeid E., Barlage M., Chen F., Smith J.A. (2013) "Development and evaluation of a mosaic approach in the WRF-Noah framework", *Journal of Geophysical Research – Atmospheres*, 118 (21), 11,918-11,935, [DOI: 10.1002/2013JD020657](https://doi.org/10.1002/2013JD020657).

52. Wang L., Gao Z., Pan Z., Guo X., Bou-Zeid E. (2013) "Evaluation of Turbulent Surface Flux Parameterizations Over Tall Grass in a Beijing Suburb". *Journal of Hydrometeorology*, e-view, DOI: [10.1175/JHM-D-12-0103.1](https://doi.org/10.1175/JHM-D-12-0103.1)
53. Li D. and Bou-Zeid E. (2013). "Synergistic interactions between urban heat islands and heat waves: the impact in cities is larger than the sum of its parts". *Journal of Applied Meteorology and Climatology*, 52 (9), 2051–2064, DOI: [10.1175/JAMC-D-13-02.1](https://doi.org/10.1175/JAMC-D-13-02.1).  
Featured in a podcast by *Scientific American* (<http://tinyurl.com/HW-UHI-podcast>).
54. Wang Z., Bou-Zeid E., Smith J.A. (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, DOI: [10.1002/qj.2032](https://doi.org/10.1002/qj.2032).
55. Li D., Bou-Zeid E., Baeck M.L., Jessup S., Smith J.A. (2013) "Modeling Land Surface Processes and Heavy Rainfall in Urban Environments: Sensitivity to Urban Surface Representations". *Journal of Hydrometeorology*, 14, 1098–1118, , DOI: [10.1175/JHM-D-12-0154.1](https://doi.org/10.1175/JHM-D-12-0154.1).
56. Huang J. and Bou-Zeid E. (2013) "Turbulence and Vertical Fluxes in the Stable Atmospheric Boundary-Layer I: A Large-Eddy Simulation Study". *Journal of the Atmospheric Sciences*, 70(6), 1513–1527, DOI: [10.1175/JAS-D-12-0167.1](https://doi.org/10.1175/JAS-D-12-0167.1).
57. Huang J., Bou-Zeid E., Golaz J.C. (2013) "Turbulence and Vertical Fluxes in the Stable Atmospheric Boundary-Layer II: A Novel Mixing Length Model". *Journal of the Atmospheric Sciences*, 70(6), 1528–1542, DOI: [10.1175/JAS-D-12-0168.1](https://doi.org/10.1175/JAS-D-12-0168.1).
58. Mirocha J., Kirkil G., Bou-Zeid E., Chow F.K., Kosović B. (2013) "Transition and Equilibration of Neutral Atmospheric Boundary Layer Flow in One-Way Nested Large-Eddy Simulations Using the Weather Research and Forecasting Model". *Monthly Weather Review*, 141, 918–940, DOI: [10.1175/MWR-D-11-00263.1](https://doi.org/10.1175/MWR-D-11-00263.1).
59. Katul G.G., Li D., Chamecki M., Bou-Zeid E. (2013) "Mean scalar concentration profile in a sheared and thermally stratified atmospheric surface layer". *Physical Review E*, 87(2), 023004, DOI: [10.1103/PhysRevE.87.023004](https://doi.org/10.1103/PhysRevE.87.023004).
60. Sun T., Bou-Zeid E., Wang Z., Zerba E., Ni G. (2013) "Hydrometeorological Determinants of Green Roof Performance via a Vertically-Resolved Model for Heat and Water Transport". *Building and Environment*, 60, 211–224. DOI: [10.1016/j.buildenv.2012.10.018](https://doi.org/10.1016/j.buildenv.2012.10.018).
61. Talbot C., Bou-Zeid E., Smith J.A. (2012) "Nested mesoscale-large eddy simulations with WRF: performance in real test cases". *The Journal of Hydrometeorology*, 13(5), 1421–1441, DOI: [10.1175/JHM-D-11-048.1](https://doi.org/10.1175/JHM-D-11-048.1).
62. Li D., Katul G.G., Bou-Zeid E. (2012) "Mean velocity and temperature profiles in a sheared diabatic turbulent boundary layer". *Physics of Fluids*, 24 (10), 105105, DOI: [10.1063/1.4757660](https://doi.org/10.1063/1.4757660).
63. Myhrvold C., Stone H., Bou-Zeid E. (2012) "What is the use of elephant hair?". *PLoS ONE*, 7(10): e47018. DOI:[10.1371/journal.pone.0047018](https://doi.org/10.1371/journal.pone.0047018).  
[See also list of media articles covering this paper at http://efm.princeton.edu/News.htm](http://efm.princeton.edu/News.htm)
64. Li D., Bou-Zeid E., De Bruin H.A.R. (2012) "Monin-Obukhov Similarity Functions for the Structure Parameters of Temperature and Humidity". *Boundary-Layer Meteorology*, 145 (1), 45–67, DOI: [10.1007/s10546-011-9660-y](https://doi.org/10.1007/s10546-011-9660-y).

65. Wang Z. and Bou-Zeid E. (2012) "A novel approach for the estimation of soil ground heat flux". *Agricultural and Forest Meteorology*, 154–155, 214–221, [DOI: 10.1016/j.agrformet.2011.12.001](https://doi.org/10.1016/j.agrformet.2011.12.001).
66. Kirkil G., Mirocha J., Bou-Zeid E., Chow F.K., Kosović B. (2012) "Implementation and Evaluation of Dynamic Subfilter-Scale Stress Models for Large-Eddy Simulation using WRF", *Monthly Weather Review*, 140, 266–284, [DOI: 10.1175/MWR-D-11-00037.1](https://doi.org/10.1175/MWR-D-11-00037.1).
67. Vercauteren N., Huwald H., Bou-Zeid E., Selker J.S., Lemmin U., Parlange M.B., Lunati I. (2011) "Evolution of Superficial Lake Water Temperature Profile Under Diurnal Radiative Forcing", *Water Resources Research*, 47, W09522, [DOI:10.1029/2011WR010529](https://doi.org/10.1029/2011WR010529).
68. Wang Z., Bou-Zeid E., Au S.K., Smith J.A. (2011) "Analyzing the Sensitivity of WRF's Single-Layer Urban Canopy Model to Parameter Uncertainty Using Advanced Monte Carlo Simulation", *the Journal of Applied Meteorology and Climatology*, 50, 1795–1814, [DOI: 10.1175/2011JAMC2685.1](https://doi.org/10.1175/2011JAMC2685.1).
69. Li D. and Bou-Zeid E. (2011) "Coherent Structures and the Dissimilarity of Turbulent Transport of Momentum and Scalars in the Unstable Atmospheric Surface Layer". *Boundary-Layer Meteorology*, 140(2), 243–262, [DOI:10.1007/s10546-011-9613-5](https://doi.org/10.1007/s10546-011-9613-5).
70. Wang Z. and Bou-Zeid E. (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", *the Journal of Geophysical Research – Atmospheres*, 116, D08110, [DOI: 10.1029/2010JD015117](https://doi.org/10.1029/2010JD015117).
71. Wang Z., Bou-Zeid E., Smith J.A. (2011) "A spatially-analytical scheme for surface temperatures and conductive heat fluxes in urban canopy models", *Boundary-Layer Meteorology*, 138(2), 171–193, [DOI: 10.1007/s10546-010-9552-6](https://doi.org/10.1007/s10546-010-9552-6).
72. Bou-Zeid E., Higgins C., Huwald H., Parlange M.B., Meneveau C. (2010). "Field study of the dynamics and modelling of subgrid scale turbulence in a stable atmospheric surface layer over a glacier". *the Journal of Fluid Mechanics*, 665, 480–515, [DOI: 10.1017/S0022112010004015](https://doi.org/10.1017/S0022112010004015).
73. Nadeau D.F., Brutsaert W., Parlange M. B., Bou-Zeid E., Barrenetxea G., Couach G., Boldi M.-O., Selker J., Vetterli M. (2009) "Estimation of Urban Sensible Heat Flux Using a Dense Wireless Network of Observations". *Environmental Fluid Mechanics*, 9, 635–653, [DOI: 10.1007/s10652-009-9150-7](https://doi.org/10.1007/s10652-009-9150-7).
74. Huwald H., Higgins C., Boldi M., Bou-Zeid E., Lehning M., Parlange M.B. (2009) "Albedo effect on radiative errors in air temperature measurements". *Water Resources Research*, 45, W08431, [DOI: 10.1029/2008WR007600](https://doi.org/10.1029/2008WR007600).
75. Bou-Zeid E., Overney J., Rogers B.D., Parlange M.B., (2009) "The Effects of Building Representation and Clustering in Large Eddy Simulations of Flows in Urban Canopies". *Boundary-Layer Meteorology*, 132(3), 415–436, [DOI: 10.1007/s10546-009-9410-6](https://doi.org/10.1007/s10546-009-9410-6).
76. Vercauteren N., Bou-Zeid E., Huwald H., Parlange M.B., Brutsaert W. (2009) "The estimation of wet-surface evaporation from sensible heat flux measurements". *Water Resources Research*, 45, W06424, [DOI:10.1029/2008WR007544](https://doi.org/10.1029/2008WR007544).
77. Bou-Zeid E, Vercauteren N., Parlange M.B., Meneveau C. (2008) "Scale dependence of subgrid-scale model coefficients: an a-priori study". *Physics of Fluids*, 20(11), 115106. [DOI: 10.1063/1.2992192](https://doi.org/10.1063/1.2992192).



78. Vercauteren N., Bou-Zeid E., Parlange M.B., Lemmin U., Huwald H., Selker J., Meneveau C. (2008) "Subgrid-scale dynamics for water vapor, heat, and momentum over a lake". *Boundary-Layer Meteorology*, 128(2), 205-228. [DOI: 10.1007/s10546-008-9287-9](https://doi.org/10.1007/s10546-008-9287-9).
79. Assouline S., Tyler S., Tanai Y., Cohen S., Bou-Zeid E., Parlange M.B., Katul G. (2008) "Evaporation from three water bodies of different sizes and climates: Measurements and scaling analysis". *Advances in Water resources*, 31(1), 160-172. [DOI: 10.1016/j.advwatres.2007.07.003](https://doi.org/10.1016/j.advwatres.2007.07.003).
80. Bou-Zeid E., Parlange M.B., Meneveau C. (2007) "On the parameterization of surface roughness at regional scales". *Journal of the Atmospheric Sciences*, 64 (1), 216–227. [DOI: 10.1175/JAS3826.1](https://doi.org/10.1175/JAS3826.1).
81. Bou-Zeid E. Meneveau C., Parlange M.B. (2005) "A scale-dependent Lagrangian dynamic model for large eddy simulation of complex turbulent flows". *Physics of fluids*, 17, 025105. [DOI: 10.1063/1.1839152](https://doi.org/10.1063/1.1839152).
82. Bou-Zeid E., Meneveau C., Parlange M.B. (2004) "Large-eddy simulation of neutral atmospheric boundary layer flow over heterogeneous surfaces: Blending height and effective surface roughness". *Water Resources Research*, 40, W02505. [DOI: 10.1029/2003WR002475](https://doi.org/10.1029/2003WR002475).
83. Bou-Zeid E and El-Fadel M. (2004) "Parametric sensitivity analysis of leachate transport simulations at landfills". *Waste Management*, 24, 681-689. [DOI: 10.1016/j.wasman.2004.03.004](https://doi.org/10.1016/j.wasman.2004.03.004).
84. El-Fadel M., Bou-Zeid E., Chahine W. (2003) "Landfill evolution and treatability assessment of high-strength leachate from MSW with high organic and moisture content". *International Journal of Environmental Studies*, 60, 603-615. [DOI: 10.1080/0020723032000069187](https://doi.org/10.1080/0020723032000069187).
85. El-Fadel M. Bou-Zeid E., Chahine W. (2002) "Leachate generation and transport from solid waste disposal at a former quarry site". *Journal of Solid Waste Technology and Management*, 28, 60-70.
86. Bou-Zeid E and El-Fadel M. (2002) "Climate change and water resources in the Middle East: a vulnerability and adaptation assessment". *ASCE, Journal of Water Resources Planning and Management*, 128(5), 343-355. [DOI: 10.1061/\(ASCE\)0733-9496\(2002\)128:5\(343\)](https://doi.org/10.1061/(ASCE)0733-9496(2002)128:5(343)).
87. El-Fadel M., Bou-Zeid E. Chahine W., Alayli B., (2002) "Temporal variation of leachate quality from pre-sorted and baled MSW with high organic and moisture content". *Waste Management*, 22(3), 269-282. [DOI: 10.1016/S0956-053X\(01\)00040-X](https://doi.org/10.1016/S0956-053X(01)00040-X).
88. El-Fadel M. and Bou-Zeid E (2001) "Climate Change and water resources in the middle east: vulnerability, socio-economic impacts, and adaptation". *Fondazione Eni Enrico Mattei (FEEM) Working Paper No. 46.2001*. [DOI: 10.2139/ssrn.278514](https://doi.org/10.2139/ssrn.278514).
89. El-Fadel M. and Bou-Zeid E. (2001) "Economic valuation of greenhouse gas emissions reduction in Lebanon". *International Journal of Environmental Studies*, 58(4), 459-486. [DOI: 10.1080/00207230108711344](https://doi.org/10.1080/00207230108711344).
90. El-Fadel M. and Bou-Zeid E. (1999) "Transportation GHG emissions in developing countries. The case of Lebanon". *Transportation Research Part D*, 4(4), 251-264. [DOI: 10.1016/S1361-9209\(99\)00008-5](https://doi.org/10.1016/S1361-9209(99)00008-5).

## Patents

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Bou-Zeid E., and M. Momen (2016) "System and method for performing wind forecasting." Patent Application # PCT/US2016/024508, Google Patent publication number WO2016160697 A1: <https://www.google.com/patents/WO2016160697A1?cl=en>.

## Book Chapters and other Archival Publications

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El-Fadel M. and Bou-Zeid E. (2003) "Climate change and water resources in the Middle East: vulnerability, socio-economic impacts, and adaptation". In *Climate Change in the Mediterranean*, eds. Giupponi, C. and Schechter, M., Edward Elgar Publishing, Cheltenham, UK.

## Proceedings Papers

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1. Malings C., Pozzi M., Klima K., Bou-Zeid E., Ramamurthy P., and Bergés M. (2016) "[Optimal Sensor Placement for Urban Heat Risk Response](#)", 13th International Conference on Probabilistic Safety Assessment and Management (PSAM 13). Seoul, Republic of Korea.
2. Teitelbaum, E., Meggers F., Scherer G., Ramamurthy P., Wang L., and Bou-Zeid E., (2015) "ECCENTRIC Buildings: Evaporative Cooling in Constructed ENvelopes by Transmission and Retention Inside Casings of Buildings". Proceedings of the 6th International Building Physics Conference, IBPC 2015, *Energy Procedia*, 78, 1593–1598. DOI: [10.1016/j.egypro.2015.11.218](https://doi.org/10.1016/j.egypro.2015.11.218)
3. Wang W., Smith C., So S., Bou-Zeid E., Wysocki G. (2011) "[Wireless Sensor Networks for Monitoring of Atmospheric Chemicals](#)". Optical Instrumentation for Energy and Environmental Applications Conference, Optical Society of America, Austin, TX, Joint Poster Session PV/SOLAR/SOLED/E2 (JWE).
4. Bou-Zeid E., Shah, S., Parlange M.B., Smits, L., Higgins, C., Huwald, H., and Meneveau C. (2010) "[Experimental and numerical investigations of stably stratified atmospheric flows](#)". 16<sup>th</sup> US National Congress of Theoretical and Applied Mechanics, State College, PA, Paper number USNCTAM2010-636.
5. Wang Z-H., Bou-Zeid E., Smith J. A. (2010) "Application of a sensor network to study the energy budget in urban canopies". Proceedings of the 15<sup>th</sup> Symposium on Meteorological Observation and Instrumentation, American Meteorological Society 2010 Annual Meeting, Atlanta, GA. ([paper](#)) ([presentation](#)).
6. Talbot C. Bou-Zeid E., Smith J.A. (2010) "Multiscale Atmospheric Simulations Over a Complex and Heterogeneous Terrain: Surface Variability and Land-Atmosphere Interactions". Proceedings of the 22<sup>nd</sup> Conference on Climate Variability and Change the 24<sup>th</sup> Conference on Hydrology, American Meteorological Society 2010 Annual Meeting, Atlanta, GA. ([paper](#)) ([presentation](#)).
7. Bou-Zeid E., Huwald H., Lemmin U., Selker J.S., Meneveau C., Parlange M.B. (2007) "[Atmospheric surface layer turbulence over water surfaces and sub-grid scale physics](#)". pp. 517-519 in *Advances In Turbulence XI*, Proceedings of the 11th EUROMECH European Turbulence Conference, June 25-28, 2007, Porto, Portugal, Editors: J.M.L.M. Palma and A.Silva Lopes Springer Proceedings in Physics 117, Springer, Heidelberg, ISBN 978-3-540-72603-6

8. Parlange M.B., Bou-Zeid E., Huwald H., Chamecki M., Meneveau C. (2007) "[SNOHATS: Stratified atmospheric turbulence over snow surfaces](#)". pp.520-522 in *Advances In Turbulence XI*, Proceedings of the 11th EUROMECH European Turbulence Conference, June 25-28, 2007, Porto, Portugal, Editors: J.M.L.M. Palma and A. Silva Lopes Springer Proceedings in Physics 117, Springer, Heidelberg, ISBN 978-3-540-72603-6
9. Bou-Zeid E., Meneveau C., Parlange M.B. (2004) "[Applications of the Lagrangian dynamic model in LES of turbulent flow over surfaces with heterogeneous roughness distributions](#)". Paper number HT-FED2004-56127, Proceedings of the 2004 ASME Heat Transfer/Fluids Engineering Summer Conference, July 11-15, 2004, Charlotte, North Carolina, USA.
10. Bou-Zeid E., Meneveau, C., Parlange M.B. (2004) "[Comparison of four eddy-viscosity SGS models in large-eddy simulation of flows over rough walls](#)". Paper number HT-FED2004-56126, Proceedings of the 2004 ASME Heat Transfer/Fluids Engineering Summer Conference, July 11-15, 2004, Charlotte, North Carolina, USA.
11. Pahlow M, Bou-Zeid E, Parlange M.B. (2001) "[Entrainment into the atmospheric boundary layer: LIDAR observations and LES simulations](#)". Proceedings of the 2001 International Symposium on Environmental Hydraulics, Tempe, Arizona, December 5-8.
12. El-Fadel M. and Bou Zeid E. (1999) "[Transportation emissions in Lebanon: extent and mitigation](#)". In *Urban Transport V: Urban Transport and the Environment for the 21st Century*, volume 5, Sucharov L.J., ed, WIT Press, Southampton, UK, pp. 149-158.

## Unrefereed Scientific Publications

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Margulis, S. and Bou-Zeid E. (2010) "Large-scale field experiments in hydrology: What have we learned and where do we go from here?" AGU Hydrology Section Newsletter, December 2010, pp. 28-30, <http://hydrology.agu.org/pdf/AGUHydro-201012.pdf>.

## Selected Invited Talks, Seminars, and Panels

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- 2017:
- ⊃ Stevens Institute of Technology, Department of Civil, Environmental and Ocean Engineering
  - ⊃ Seoul National University, College of Agriculture and Life Sciences
  - ⊃ Yonsei University, Department of Atmospheric Sciences
  - ⊃ Princeton Plasma Physics Laboratory, The Ronald E. Hachter "Science on Saturdays" Lecture for high school students and teachers
  - ⊃ Notre Dame University, Department of Civil and Environmental Engineering
  - ⊃ University of Washington, Department of Mechanical Engineering
- 2016:
- ⊃ Tiger Talks in the City "Smart Solutions for Smart Cities" panel participant
  - ⊃ Brookhaven National Lab, Symposium on "Energy & water cycles in the urban-natural system: challenges and opportunities
  - ⊃ University of Perugia, Italy, Department of Engineering, Interuniversity Research Center
  - ⊃ 2016 MIRTHER+ Symposium on Regional Air Quality Monitoring, and Urban Sensing in Safety and Security Applications, City College of New York
  - ⊃ Duke University, Workshop on Wireless Intelligent Sensor Networks (WISeNet)
  - ⊃ Baltimore Ecosystem Study Long Term Ecological Research Network, 2016 Annual Meeting

- 2015:    ⊃ American Geophysical Union, Fall 2015 meeting, invited talk in session “A52B: Atmospheric Boundary Layer Processes and Turbulence”  
           ⊃ 13<sup>th</sup> US National Congress on Computational Mechanics, invited talk in the mini-symposium on “Large eddy and direct numerical simulations with geophysical applications”  
           ⊃ Commonwealth Scientific and Industrial Research Organisation (CSIRO), Weather & Renewable Energy, CSIRO Oceans & Atmosphere Flagship  
           ⊃ Melbourne University, Department of Mechanical Engineering  
           ⊃ Monash University, Department of Civil Engineering  
           ⊃ Monash University, School of Geography & Environmental Science
- 2014:    ⊃ National Center for Atmospheric Research, Mesoscale & Microscale Meteorology Division  
           ⊃ Carnegie Mellon University, Department of Civil and Environmental Engineering  
           ⊃ Johns Hopkins University, Center for Environmental and Applied Fluid Mechanics  
           ⊃ University of Reading (UK), Department of Meteorology (two talks)  
           ⊃ City University of New York CREST Institute & Brookhaven National Laboratory workshop on “Developing a Strategy to Advance Our Understanding of the Urban Environment and Its Impact on Local and Regional Weather and Climate”  
           ⊃ Arizona State University, School of Sustainable Engineering and the Built Environment  
           ⊃ Columbia University, Sustainable Development (SDEV) program
- 2013:    ⊃ The New York City Panel on Climate Change (NPCC2), Climate Risk Information Report on Climate Change Indicators and Monitoring Workshop (short talk + panel discussions).  
           ⊃ Stony Brook University, Institute for Terrestrial and Planetary Atmospheres, School of Marine and Atmospheric Sciences.  
           ⊃ Traversing New Terrain in Meteorological Modeling, Air Quality and Dispersion Conference, University of California at Davis.  
           ⊃ Urban Landscapes and Climate Change workshop, Argonne National Laboratory  
           ⊃ National Weather Center Colloquium, NOAA & Oklahoma University School of Meteorology
- 2012:    ⊃ American Geophysical Union, Fall 2012 meeting, invited talk in session “EP31E. Aeolian Processes and Desert Landscape Development: Feedbacks Among Atmospheric Boundary Layer Turbulence, Sediment Transport, and Morphodynamics II.”  
           ⊃ American Geophysical Union, Fall 2012 meeting, invited talk in session “H53N. Water Quality and Quantity in Urban Systems: Energy Budgets, Microbes, and Human Interactions”  
           ⊃ University of Virginia, Department of Environmental Sciences  
           ⊃ Energy Path 2012: America’s Sustainable Energy Future, <http://energypath.org/energypath2012/Home.aspx>
- 2011:    ⊃ Oregon State University, Department of Biological and Ecological Engineering and College of Atmospheric and Oceanic Sciences  
           ⊃ The Chinese Academy of Science, Institute of Atmospheric Physics, Beijing, China  
           ⊃ University of Illinois at Urbana-Champaign, Department of Civil and Environmental Engineering  
           ⊃ King Abdullah University of Science and Technology (KAUST), Invited lecture in the Red Sea Research Center Symposium, Jeddah, Saudi Arabia.  
           ⊃ Columbia University, Department of Applied Physics and Applied Mathematics, Colloquium in Climate Science  
           ⊃ University of Maryland at Baltimore County, Center for Urban Environmental Research and Education

- 2010:    ⊃ Pennsylvania State University, Department of Meteorology  
           ⊃ John Wyngaard’s Retirement Symposium, Pennsylvania State University
- 2009:    ⊃ Massachusetts Institute of Technology, Department of Civil & Environmental Engineering  
           ⊃ Patterns in Soil-Vegetation-Atmosphere Systems Monitoring, Modelling and Data  
           Assimilation, International Workshop, Invited Keynote Lecture, Aachen, Germany  
           ⊃ European Geosciences Union, General Assembly 2009, Vienna, solicited talk in the session:  
           Scaling, subgrid models, downscaling and parameterization
- 2008:    ⊃ Geophysical Fluid Dynamics Laboratory, National Oceanic and Atmospheric Administration  
           ⊃ Imperial College London, Institute for Mathematical Sciences, 3d-IMS Turbulence  
           Workshop: Informal discussions on fractal-generated turbulence, London, UK.  
           ⊃ King’s College London, Department of Geography, London, UK.
- 2007:    ⊃ Harvard University, Division of Engineering and Applied Sciences  
           ⊃ Rice University, Department of Civil and Environmental Engineering  
           ⊃ University of Houston, Department of Earth And Atmospheric Sciences  
           ⊃ University of Washington – Seattle, Department of Atmospheric Sciences  
           ⊃ Drexel University – Philadelphia, Department of Civil and Environmental Engineering  
           ⊃ City University of New York, Department of Civil Engineering  
           ⊃ University of Surrey, Environmental Flow Research Centre, Surrey, UK.
- 2006:    ⊃ Mathematisches Forschungsinstitut Oberwolfach, Workshop on Mathematical Theory and  
           Modelling in Atmosphere-Ocean Science, Oberwolfach , Germany.  
           ⊃ ETH Swiss Federal Institute of Technology at Zurich, Institute of Hydromechanics and  
           Water Resources Management, Zurich, Switzerland.  
           ⊃ American University of Beirut, Department of Civil and Environmental Engineering,  
           Beirut, Lebanon.
- 2005:    Cornell University, Department of Civil and Environmental Engineering
- 2003:    Virginia Polytechnic Institute and State University, Department of Engineering Science &  
           Mechanics

### **Selected Recent Conference Presentations**

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1. Bou-Zeid E, X Gao, G Katul (2017) “The role of return-to-isotropy in wall-bounded flows with buoyancy” Bulletin of the American Physical Society, 2017
2. Yang J. And Bou-Zeid E. (2017) “The other side of the coin: urban heat islands as shields from extreme cold”, 2017 Fall Meeting of the American Geophysical Union.
3. Omidvar H., Bou-Zeid E., Song J., Yang J., Arwatz G., Byers C., Wang Z., Hultmark M., Kaloush K. (2017) “Rapid Modification of Land Surface Temperature during Rainfall” 13th Symposium of the Urban Environment at the 2017 American Meteorological Society Annual Meeting, Seattle, WA.
4. Li Q., Bou-Zeid E., Grimmond S. (2017) “On the Momentum and Scalar Roughness Lengths of Urban Surfaces” 13th Symposium of the Urban Environment at the 2017 American Meteorological Society Annual Meeting, Seattle, WA.

5. Bou-Zeid E., Li Q., Grimmond S. (2017) "Large Eddy Simulations of Flow and Scalar Exchanges over Urban Terrain to Improve Urban Canopy Model Parameterizations" 13th Symposium of the Urban Environment at the 2017 American Meteorological Society Annual Meeting, Seattle, WA.
6. Hezaveh S.H., Bou-Zeid E., Momen M. (2017) "A Hybrid Model for Wind-Energy Forecasting" Forecasting for Wind Energy: General Topics at the 2017 American Meteorological Society Annual Meeting, Seattle, WA.
7. Momen M. and Bou-Zeid E (2016) "Towards a more comprehensive understanding of the diabatic ABL dynamics: variability of the pressure gradient in time and height", AGU Fall Meeting, abstract number A11R-03.
8. Talebpour, M., C. Welty, and E. Bou-Zeid, 2016: Land-Atmosphere-Hydrosphere Interactions in Urban Terrains. AGU Fall Meeting, abstract number H13C-1375.
9. Bou-Zeid E. and Li Q., (2016) "Contrasts Between Momentum and Scalar Exchanges Over Very Rough Surfaces", *Bulletin of the American Physical Society*, 61.
10. Momen M. and Bou-Zeid E., (2016) "Turbulence dynamics in unsteady atmospheric flows", *Bulletin of the American Physical Society*, 61.
11. Shim S., Shin S., Meggers F., Bou-Zeid E., and Stone H. A., (2016) "Controlled evaporative cooling on a superhydrophilic surface: building a green wall", *Bulletin of the American Physical Society*, 61.
12. Hezaveh S.H., Bou-Zeid E., Dabiri J., Kinzel M., and Martinelli L., (2016) "Cluster designs for vertical axis wind turbine farms", 22<sup>nd</sup> Symposium on Boundary Layers and Turbulence, Salt Lake City, UT.
13. Momen M., and Bou-Zeid E. (2016) "Exploring the Impact of Unsteady Pressure Forcing and Surface Buoyancy on the ABL through a Reduced Mass-Spring-Damper Model", 22<sup>nd</sup> Symposium on Boundary Layers and Turbulence, Salt Lake City, UT.
14. Li Q., Bou-Zeid E., Anderson W., Grimmond S. (2015) "Developing Urban Surface Parameterizations for Momentum and Scalars Using Large-Eddy Simulations", 22<sup>nd</sup> Symposium on Boundary Layers and Turbulence, Salt Lake City, UT.
15. Bou-Zeid E., Li Q, Vercauteren N, Parlange M.B. (2016) "Flux-Profile Relations over Water Surfaces: Disentangling the Influences of Stability and Waves", 22<sup>nd</sup> Symposium on Boundary Layers and Turbulence, Salt Lake City, UT.
16. Huang J., Thatcher M., Bou-Zeid E. (2016) "Testing the HBG model under strong stabilities: a SCM inter-comparison study using CCAM", 22<sup>nd</sup> Symposium on Boundary Layers and Turbulence, Salt Lake City, UT.
17. Caulton D. R., and Coauthors, 2016: Investigation of natural gas plume dispersion using mobile observations and large eddy simulations. Vol. 18 of, EGU General Assembly Conference Abstracts, 11209.

18. Bou-Zeid E., Ryu Y.-H., Smith J.S., Newburn D.A. (2015) "The Hydro-Meteorological Implications of Zoning Laws: Can Land Use Regulations of Urban Density and Sprawl Improve a City's Resilience?" AGU Fall Meeting, abstract number H23M-03.
19. Sutherland D., Chung. D., Ooi A., Bou-Zeid E. (2015) "The law-of-the-wall in mixed convection flow in a vertical channel". Bulletin of the American Physical Society, 60.

## Reviews

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*Editorial Boards memberships:* Advances in Water Resources

*Papers for Atmospheric Sciences Journals:* Journal of the Atmospheric Sciences, Boundary-Layer Meteorology, Journal of Applied Meteorology and Climatology, Journal of Hydrometeorology, Journal of Geophysical Research – Atmospheres, Monthly Weather Review, Geophysical Research Letters, Atmospheric Environment, Atmospheric and Oceanic Science Letters, Quarterly Journal of the Royal Meteorological Society, Agricultural and Forest Meteorology, EOS, Journal of Atmospheric and Oceanic Technology, Weather and Forecasting, Urban Climate.

*Papers for Fluid Mechanics Journals:* Journal of Fluid Mechanics, Physics of Fluids, Computers and Fluids, Journal of Turbulence, Environmental Fluid Mechanics, Theoretical and Computational Fluid Dynamics, Physical Review - Fluids.

*Papers for Hydrology and Water Resources Journals:* Water Resources Research, Advances in Water Resources, Journal of Hydrology, Hydrological Processes, Transport in Porous Media, Water International, Hydrology and Earth System Sciences

*Other Journals:* Journal of Environmental Engineering, Environmental Science and Technology, Environmental Engineering Science, Physics and Chemistry of the Earth, Environmental Management, Journal of the Air and Waste Management Association, Waste Management and Research, Journal of Applied Mathematics, Limnology and Oceanography, Wind Energy, Journal of Renewable and Sustainable Energy, IEEE Transactions on Geoscience and Remote Sensing, Geoscientific Model Development, Energy, Environmental Modelling & Software, PLoS ONE, Scientific Reports, Nature Communications, Geophysical Model Development.

*Proposal reviews and panel participations:* US National Science Foundation (various programs), German Research Foundation, Natural Environment Research Council (NERC) of the UK, Swiss National Science Foundation, Czech Science Foundation, Natural Sciences and Engineering Research Council of Canada (NSERC), Netherlands Organisation for Scientific Research, US Environmental Protection Agency, US Army Research Laboratory, American Chemical Society – Petroleum Research Fund, École Polytechnique Fédérale de Lausanne fellowship program.

*Book proposal reviews:* Oxford University Press, Wiley Press

## Current Ph.D. Students, Postdoctoral Researchers and Visiting Students

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Ph.D. Students: Hamidreza Omidvar, Mohammad Allouche

Postdocs: Khaled Ghannam, Jiachuan Yang, Maider Llaguno Munitxa, Dana Coulton (co-advised with Prof. Mark Zondlo)

## Previously Advised Students and Postdoctoral Researchers

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### *Postdocs:*

- ⊃ Seyed Hossein Hezaveh, 2016, working with HKF technology to attempt commercialization of the technology developed during postdoc at Princeton
- ⊃ Young-Hee Ryu, 2015, now postdoctoral researcher at NCAR - Boulder
- ⊃ Prathap Ramamurthy, 2014, now assistant professor at The City University of New York
- ⊃ Steve Jessup, 2013, now assistant professor at SUNY - The College of Brockport
- ⊃ Jing Huang, 2012, now Research Scientist at CSIRO, Australia
- ⊃ Charles Talbot, 2011, now researcher in France

### *Ph.D. Students:*

- ⊃ Zhihua Wang, 2011, now assistant professor at Arizona State University
- ⊃ Dan Li, 2013, now assistant professor at Boston University
- ⊃ Stimit Shah, 2014, now CFD software developer at Aerion Corporation (aerionsupersonic.com)
- ⊃ Seyed Hossein Hezaveh, 2016, postdoctoral researcher at Princeton University till July 2017
- ⊃ Qi Li, 2016, now postdoctoral researcher at Columbia University, to start as Assistant Professor in the Civil and Environmental Engineering Department at Cornell University in 2018
- ⊃ Mostafa Momen, 2016, now postdoctoral researcher at Stanford University

### *Masters Students:*

- ⊃ Yinzhen Jin, 2013, co-advised with Professor Warren Powell, started a tech company in China.
- ⊃ Xiang Gao, 2017, in Mechanical and Aerospace Engineering Department.

### *Visiting Graduate Students:*

- ⊃ Claudia Fabiani, 2017, University of Perugia
- ⊃ Maider Llaguno Munitxa, 2013-2016, Swiss Federal Institute Technology – Zurich
- ⊃ Xiaofeng Hu, 2013, Tsinghua University
- ⊃ Renalda El-Samra, 2013, American University of Beirut
- ⊃ Ting Sun, 2012, Tsinghua University

### *Undergraduate Senior Theses Supervised:*

- ⊃ Jonathan Bradshaw, 2010: Cost-effectiveness of weatherization in low-income urban housing stock
- ⊃ Thomas Maltbaek, 2011: Optimal mitigation strategies for the urban heat island effect
- ⊃ Emily Moder, 2013: A decision-making model for building energy retrofits
- ⊃ Christopher Hamm, 2014: Pushing the envelope: the feasibility of passive house integration in the United States
- ⊃ Taylor Morgan, 2016: Understanding the water-energy nexus: a Princeton university case study
- ⊃ Ingrid Yen, 2016: Novel methods for measuring heat exchanges between urban facets and the atmosphere
- ⊃ Hope Lorah, 2017: The water-energy nexus in large cities
- ⊃ Christie Jiang, 2017: Improving urban climate data collection: assessment and redesign of Tsinghua's meteorological sensor network
- ⊃ Alistair Berven, 2017: Improving algae growth for carbon sequestration and biofuel production

See list of other undergraduate and high-school advisees at <http://efm.princeton.edu/People.htm>



## **Awards to student and postdocs while working in Bou-Zeid's lab**

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- ⊃ Hamidreza Omidvar, the Mary and Randall Hack '69 Graduate Award, Princeton Environmental Institute
- ⊃ Maider Llaguno Muxixta, selected to participate in MIT's CEE Rising Stars program.
- ⊃ Qi Li, Fellowship in Geophysical Fluid Dynamics at Woods Hole Oceanographic Institution
- ⊃ Qi Li, student presentation award at the 9<sup>th</sup> ICUC/12<sup>th</sup> AMS symposium on the urban environment
- ⊃ Qi Li, Wu Prize for Excellence from the Princeton Engineering Office of Graduate Affairs
- ⊃ Stimit Shah, Selected to Participate in Argonne Training Program for Extreme-Scale Computing
- ⊃ Dan Li, "Award for Outstanding Students Abroad" from Chinese Government
- ⊃ Dan Li, Outstanding Student Paper Award in AGU's Fall Meeting 2012.
- ⊃ Dan Li, Wu Prize for Excellence from the Princeton Engineering Office of Graduate Affairs
- ⊃ Undergrad student team co-led by Elie Bou-Zeid, EPA's National Sustainable Design competition "P3: People, Prosperity and the Planet" for their project "Power in a Box" (<http://www.princeton.edu/main/news/archive/S33/55/56I53/index.xml?section=topstories>),

## **Teaching at Princeton**     *(co-taught courses are in italics)*

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- ⊃ Environmental Fluid Mechanics (undergraduate, CEE 305, yearly)
- ⊃ Boundary Layer Meteorology (graduate, CEE 588, every other year)
- ⊃ Cities in the 21<sup>st</sup> Century: The nexus of climate, water and energy challenges (graduate), given in Springs of 2013 and 2017
- ⊃ *Environmental Engineering Laboratory (undergraduate, CEE 308, once in 2017)*
- ⊃ *Environmental Engineering Fundamentals I: Atmospheric and Surface Processes (graduate, CEE 501, 4 times: 2008-2011)*
- ⊃ *Introduction to Environmental Engineering (undergraduate, CEE 303, once in 2009)*
- ⊃ *Engineering Projects in Community Service (EPICS): the student team in the course went on to win a 90,000 USD grant through EPA's national "P3: People, Prosperity and the Planet Student Design Competition for Sustainability" for their project "Power in a Box", which aims to develop a portable hybrid wind-solar renewable energy system that fits in a shipping container (<http://www.princeton.edu/main/news/archive/S33/55/56I53/index.xml?section=topstories>), (undergraduate, EGR 250, 251, 350, 351, 450, & 451, one three-year session)*
- ⊃ **Teaching at Other Institutions:** Taught a one-week short course on "The Urban Environment: Microclimatology, Thermal Transport and Hydrology" at Tsinghua University, Department of Hydraulic Engineering, July 2011. (see lectures at [http://efm.princeton.edu/Urban Lectures.htm](http://efm.princeton.edu/Urban%20Lectures.htm)).

## **Membership in Professional Societies**

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- ⊃ American Geophysical Union (AGU)
- ⊃ American Physical Society (APS)
- ⊃ European Geosciences Union (EGU)

- ⇒ American Meteorological Society (AMS)
- ⇒ International Association for Urban Climate (IAUC)

**Selected Funded Research (role, budget, start date, duration)**

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National Science Foundation

“PREEVENTS Track 2: Collaborative Research: SHADE: Surface Heat Assessment for Developed Environments”

Institutional PI                      \$305,763 of \$820,762                      Sep 2017                      3 years

Princeton’s School of Engineering Innovation Funds

“Augmented reality for environmental visualization”

PI (sole)                      \$75,000                      Feb 2016                      14 months

Princeton Environmental Institute, Climate Grand Challenge

“Baroclinicity in the Lower Atmosphere”

PI (sole)                      \$149,500                      Sep 2016                      2 years

Siebel Energy Institute

“Novel physically-driven approaches for multiscale wind-energy forecasting”

PI (sole)                      \$50,000                      Apr 2016                      1 year

HKF technology

“Short Term Wind Forecasting for Energy Applications”

PI (sole)                      \$149,000                      Feb 2016                      1 year

Princeton University & GFDL, Cooperative Institute for Climate Science

“Exchange Mechanisms in the Urban Boundary Layer”

co-PI                      \$25,000 of \$99,500                      Mar 2016                      1 year

National Science Foundation, Sustainability Research Network

“Urban Water Innovation Network (UWIN)”

Institutional PI                      \$380,000 of \$ 1,149,346                      Jul 2015                      5 years

Department of Defense, Army Research Lab

“Rapid Modifications of Land Surface Temperature During Rainfall: Basics and Implications”

PI                      \$210,264 of \$ 360,262                      Jan 2015                      3 years

National Oceanic and Atmospheric Administration, Office of Oceanic and Atmospheric Research

“Distribution of fugitive methane emissions in the Marcellus Shale”

co-PI                      Total grant budget of \$ 598,451                      Aug 2014                      3 years

National Science Foundation, Program of Environmental Sustainability

Grant supplement for international collaboration with the Urban Micromet group at the University of Reading under the “United States and United Kingdom Clean Water Collaboration”

co-PI                      \$40,767 of \$40,767                      Sep 2013                      1 year

Princeton University, the Princeton Environmental Institute

Organization of a Workshop on “The Climatic and Environmental Impacts of Urbanization”

PI                      \$15,600 of \$15,600                      Sep 2013                      1 year

Princeton University, The Helen Shipley Fund

"Health Risks of Urban Inhabitants Under a Warmer Climate"			
PI	\$148,800 of \$148,800	Feb 2013	2 years
Princeton University & GFDL, Cooperative Institute for Climate Science			
The Response of a Turbulent Boundary Layer to a Step Change in Stabilizing Surface Heat Flux.			
co-PI	\$69,500 of \$139,000	Feb 2013	2 years
Department of Energy - Greater Philadelphia Innovation Cluster (GPIC) for Energy-Efficient Buildings			
"Roofing for the Region - Cool, Vegetative or Black: Experimental Evaluation and Modeling "			
PI	\$112,500 of \$193,250	Jan 2012	1 year
National Science Foundation, Program of Environmental Sustainability			
Grant supplement for international collaboration with the American University of Beirut on the USAID funded project "A collaborative approach towards Integrated Water Resources Management in the Litani river basin: Opportunities for climate change adaptation and socio-economic growth"			
co-PI	\$59,415 of \$59,415	Sep 2012	1 year
Princeton University, Siebel Energy Grand Challenge			
"Vertical Axis Wind Turbine Farms: Modeling and Optimization"			
PI	\$100,000 of \$200,000	Sep 2011	2 years
Princeton University, Andlinger Center for Energy and the Environment			
"Wet walls from the pore-scale to the city-scale: a study of a novel passive cooling approach"			
PI	\$25,000 of \$50,000	Jul 2011	1 years
Princeton University, MIRTHER Internal Research Grant			
"Integrating MIRTHER Sensors into Wireless Meteorological Sensing Networks"			
PI	\$90,000 of \$90,000	Jul 2011	1 year
Princeton University, School of Engineering and Applied Science			
"Water in China"			
co-PI	\$166,000 of \$500,000	Apr 2011	3 years
National Science Foundation, Water Sustainability and Climate Solicitation			
"Collaborative Research, WSC-Category 2: Regional Climate Variability and Patterns of Urban Development - Impacts on the Urban Water Cycle and Nutrient Export"			
co-PI	\$599,954 of \$5,000,000	Jan 2011	5 years
National Science Foundation, Physical and Dynamical Meteorology Program			
"The effect of surface heterogeneity and mesoscale variability on the dynamics of stable atmospheric boundary layers"			
PI	\$370,902 of \$370,902	Sep 2010	3 years
Princeton University, MIRTHER Internal Research Grant			
"Integrating MIRTHER Sensors into Wireless Meteorological Sensing Networks"			
PI	\$108,000 of \$108,000	Jul 2010	1 year
National Science Foundation, Chemical, Bioengineering, Environmental, and Transport Systems			
"RAPID: Wind Energy and Rainwater Harvesting Solutions for Sustainable Recovery of Haiti"			
co-PI	Total grant budget: \$102,000	May 2010	1 years

Princeton University, High Meadows Sustainability Fund

“A Sensor Network over Princeton”

PI                                      Total grant budget of \$323,160                      Apr 2009                                      2 years

Princeton University, Siebel Energy Grand Challenge

“Experimental and Numerical Studies of Stably Stratified Turbulent Boundary Layers”

PI                                      \$149,000 of \$254,500                      Jul 2009                                      2 years

Princeton University, MIRTHE Internal Research Grant

“Integrating MIRTHE Sensors into Wireless Meteorological Sensing Networks”

PI                                      \$102,000 of \$102,000                      Jul 2009                                      1 year