

*Curriculum Vitae*

**CRAIG B. CLEMENTS**

Associate Professor  
Fire Weather Research Laboratory  
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**RESEARCH INTERESTS** Wildfire micrometeorology, fire-atmosphere interactions and extreme fire behavior, fire weather forecasting and climatology, mountain meteorology, Doppler lidar observations of fire plumes, unmanned aircraft systems for monitoring extreme environments.

**EDUCATION**

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|---------------------|----------------------------|------|
| Ph. D., Geophysics, | University of Houston      | 2007 |
| M.S., Meteorology,  | University of Utah         | 2001 |
| B.S., Geography,    | University of Nevada, Reno | 1995 |

**PROFESSIONAL EXPERIENCE**

8/2012 – present, **Associate Professor of Meteorology** and **Director** of the Fire Weather Research Laboratory, Department of Meteorology and Climate Science, San José State University, San José, CA  
8/2007 – 8/2012, **Assistant Professor**, Department of Meteorology and Climate Science, San José State University, San José, CA  
7/2008 – 8/2008, **Visiting Scientist**, Joseph W. Jones Ecological Research Center, Ichauway, GA.  
12/2006 – 7/2007, **Research Scientist**, Department of Earth and Atmospheric Science, University of Houston, TX  
-Managed and operated University of Houston Boundary Layer Research Facility  
6/2003 – 12/2006, **Graduate Research Assistant**, Department of Geosciences, University of Houston, TX  
-Designed, constructed, maintained and operated the UH Boundary Layer Research Facility  
-Responsible for bidding, contracting, installation and purchasing of all facilities equipment.  
-Ph.D. Dissertation: Fire-Atmosphere Interactions during Grass Fires. (Advisor: Shiyuan Zhong)  
1/2001 – 6/2003, **Graduate Research Fellow**, Atmospheric Science Programme, University of British Columbia  
- Conducted research on boundary layer meteorology as a fellow of the U.S. Department of Energy *Graduate Research Environmental Fellowship*.  
2000 – 2002, **Visiting Graduate Fellow**, Pacific Northwest National Laboratory, Richland, WA  
-Conducted field measurements on mountain meteorology. (Advisor: C. David Whiteman)  
7/1998 – 12/2000, **Graduate Research Assistant**, Department of Meteorology, University of Utah, Salt Lake City, UT  
-Maintained and installed meteorological towers in Utah to support 2002 Winter Olympics  
-Conducted remote experimental studies on mountain meteorology. (Advisor: John D. Horel)

**GRANTS AND CONTRACTS AWARDED (Total Funding=\$2,994,413)**

1. Boundary layer height determination from Doppler lidar, California Energy Commission (2013-2015: \$47,000)
2. Analysis of Turbulence statistics from field experiment data. USDA Forest Service, PI, (2013-2014: \$30,000)
3. Development of a smoke monitoring workshop, Co-PI (Contract from Desert Research Institute, 2013, \$15K)
4. CAREER: Towards a Better Understanding of Wildfire-Atmosphere Interactions—Integrating Fire Weather Research and Education, National Science Foundation, PI, (AGS-1151930, 2012-2017; \$900,337)
5. Data Set for Fuels, Fire Behavior, Smoke, and Fire Effects Model Development and Evaluation – the RxCADRE Project. Joint Fire Science Program, Co-PI, 11-2-1-11 (2012-2014; \$2.2M, SJSU Budget: \$249,161)
6. Field Experiments of Fire-Atmospheric Interactions during Head Fires on Slopes, U.S. Dept. of Commerce, National Institute of Standards and Technology, Fire Grants Program, PI, (2011-2014, \$299,520), Award #60NANB11D189
7. Collaborative Research MRI: Acquisition of a Mobile Atmospheric Profiling System for Multi-Campus Research and Education (CSU-MAPS), National Science Foundation-MRI-R<sup>2</sup>, PI, (2010-2012: \$865,397, budget split with SFSU, SJSU total: \$446,894)

8. Mobile Flux Analyzer for Unmanned Aerial Vehicles, NASA, SBIR Phase-I Proposal, Co-PI, (2011; \$50,000, SJSU budget: \$22,000)
9. Wind Power Generation on High-Rise Buildings in Urban Centers, California Energy Commission, Co-PI (2010-2011; \$50,000)
10. SODAR Operation and Wind Data Analysis for Diablo Canyon Power Plant, Pacific Gas and Electric Company, PI, (2009-2010; \$16,422)
11. Analysis of RxCADRE micrometeorological data. Joseph Jones Ecological Research Center, PI, (2009; \$4000)
12. Sub-canopy transport and dispersion of smoke: A unique observation dataset and model evaluation, Joint Fire Science Program, Co-PI, (2009-2012; \$670,987; SJSU budget: \$142,941)
13. Extreme Fire Behavior State-of-the-Science Synthesis, Joint Fire Science Program, Co-PI, (2010; \$90,465; SJSU budget: \$29,259)
14. In situ measurements of fire-atmospheric dynamics: implications for PM2.5 production and dispersion, U.S. EPA Region 4, Co-PI (2008; \$70,000)
15. Experimental Studies of Fire-Atmosphere Interactions and Turbulence in Grass Fires of Different Scales, USDA Research Joint Venture Agreement- Northern Research Station, PI, (2007-2011; \$135,227)
16. Observing Released Fuel Moisture in Fire Plumes, USDA Research Joint Venture Agreement-Pacific Northwest Research Station, PI, (2007-2010; \$70,303)
17. Quantifying the role of fire-atmosphere interactions on wildfire emissions, CSU Research Funds, PI (2008; \$5,000)
18. Impact of smoke from wildfires and prescribed burning on air quality in San Jose, UPC-Reconfiguring Faculty Load to Support Student Success, PI (2008; 0.2 RT)
19. Monitoring Fire Behavior and Plume Emissions from Texas Grass Fires, Environmental Institute of Houston, Co-PI (2007; \$17,750)
20. Formation of Stratified Fog Layers and Cold Pockets over Coastal Prairies, Houston Coastal Center, PI (2007; \$18,400)
21. Mountain and Valley Winds in the Sierra Nevada, American Alpine Club Research Grant, PI (1998; \$200)

## GRANTS AND CONTRACTS PENDING

- Evaluating Fire Weather Spot Forecasts using High-Resolution WRF Modeling and Integrated Field Observations, Joint Fire Science Program, Co-PI (2012-2015; \$228K) UNFUNDED
- Enhanced Real-Time Meteorological Monitoring for Rapid-Response Emergency Management in the San Francisco Bay Area, Homeland Security Grant Program, PI, (\$51,500) UNFUNDED

## REFEREED PUBLICATIONS (\*student author)

1. Ottmar, R.D., Hiers, K.H., **Clements, C.B.**, Butler, B., Dickinson, M.B., Potter, B., O'Brien, J.J., Hudak, A.T., Rowell, E.M., Zajkowski, T.J. Measurements, datasets and preliminary results from the RxCADRE project. Special Issue, *International Journal of Wildland Fire* (Submitted)
2. **Clements, C.B.**, N. Lareau, J. Contezac, B. Davis, D. Seto, C. Teske, B. Butler, D. Jimenez. 2014: Meteorological measurements and fire weather conditions during RxCADRE. *International Journal of Wildland Fire*, Submitted.
3. Yates, E., L. Iraci, T. Tanaka, Roby, M. P. Hamil, **C. Clements**, N. Lareau, J. Contezac, M. Loewenstein, W. Gore, 2014: Airborne observations of carbon dioxide and methane emission ratios from the Yosemite Rim wildfire, California. *Environmental Research Letters*, Submitted.
4. Seto, D., T. Strand, **C. B. Clements**, H. Thistle, R. Mickler, 2014: Wind and Plume Thermodynamic Structures during Low-Intensity Subcanopy Fires. *Agricultural and Forest Meteorology*, 119, 53-61.
5. **Clements, C.B.**, and Seto, D., 2014: Observations of fire-atmosphere interactions and near-surface heat transport on a slope. *Boundary-Layer Meteorology*. Submitted.
6. **Clements, C. B.** and A. Oliphant 2014: The California State University- Mobile Atmospheric Profiling System (CSU-MAPS): A facility for research and education in boundary-layer meteorology. *Bulletin of the American Meteorological Society*, In Press.
7. Virkkula, A T. Pohja, P.P. Aalto, P. Keronen, S. Schobesberger, **C.B. Clements**, T. Petäjä, and M. Kumala, 2014: Airborne measurements of aerosols and carbon dioxide during a prescribed fire experiment at a boreal forest site *Boreal Env. Res.* 19 (suppl. B). 153-181.

8. Schroeder, W. E. Ellicott, C. Ichoku, L. Ellison, M. Dickinson, R. Ottmar; **C. Clements**; D. Hall\*; V. Ambrosia; and R. Kremens, 2014: Integrated active fire retrievals and biomass burning emissions using complementary near coincident ground, airborne and spaceborne sensor data. *Remote Sensing of Environment*
9. Virkkula, A., Levula, J., Pohja, T., Aalto, P. P., Keronen, P., Schobesberger, S., **Clements, C. B.**, Pirjola, L., Kieloaho, A.-J., Kulmala, L., Aaltonen, H., Patokoski, J., Pumpanen, J., Rinne, J., Ruuskanen, T., Pihlatie, M., Manninen, H. E., Aaltonen, V., Junninen, H., Petäjä, T., Backman, J., Dal Maso, M., Nieminen, T., Olsson, T., Grönholm, T., Kerminen, V.-M., Schultz, D. M., Kukkonen, J., Sofiev, M., de Leeuw, G., Bäck, J., Hari, P., and Kulmala, M. 2014: Prescribed burning of logging slash in the boreal forest of Finland: emissions and effects on meteorological quantities and soil properties. *Atmos. Chem. Phys.*, 14, 4473–4502, 2014.
10. Charland\*, A. and **Clements, C. B.**, 2013: Kinematic structure of a wildland fire plume observed by Doppler lidar, *Journal of Geophysical Research-Atmospheres*, **118**, 3200-3212.
11. Kochanski, A. Jenkins, M., Mandel, J., Beezley, J, **Clements, C.B.**, S. Krueger, 2013: Evaluation of WRF-Sfire Performance with Field Observations from the FireFlux Experiment. *Geosci. Model Dev.*, **6**, 1109-1126, doi:10.5194/gmd-6-1109-2013.
12. Seto\*, D., **C. B., Clements**, and W.E. Heilman, 2013: Turbulence spectra measured during fire front passage. *Agricultural and Forest Meteorology*, **169**, 195– 210.
13. Filippi, J.B., X. Pialat, **C.B. Clements**, 2013: Assessment of FOREFIRE/MESONH for wildland fire/atmosphere coupled simulation of the FireFlux experiment. *Proceedings of the Combustion Institute*, **34**(2), pp. 2633-2640.
14. Kiefer\*, C. M., **Clements, C. B.**, and B.E. Potter, 2012: Application of a Mini-Unmanned Aircraft System for In situ Monitoring of Fire Plume Thermodynamics Properties, *Journal of Atmospheric and Oceanic Technology*, **29**(3), 309-315.
15. Seto\*, D., and **C. B., Clements**, 2011: Fire Whirl Evolution Observed during a Valley Wind-Sea Breeze Reversal. *Journal of Combustion*, Volume 2011, 13 pages. doi:10.1155/2011/569475
16. **Clements, C. B.**, 2010: Thermodynamic structure of a grass fire plume. *International Journal of Wildland Fire*, **19**, 895–902.
17. Day\*, B.M., B. Rappengluck, **C. B. Clements**, S.C. Tucker, W.A. Brewer 2010: Nocturnal Boundary Layer Characteristics and Land Breeze Development in Houston, Texas during TexAQS II. *Atmospheric Environment*, **44**, 4014–4023.
18. Sun, J., Oncley, S. Burns, B. B. Stephens, D. H. Lenschow, T. Campos , R. K. Monson, D.S. Schimel, W. J. Sacks, S. F. J. De Wekker, C.T. Lai, B. Lamb, D. Ojima, P. Z. Ellsworth, L.S. L. Sternberg, S. Zhong, **C. B. Clements**, D.J. P. Moore, D. E. Anderson, A.S. Watt, J. Hu, M. Tschudi, S. Aulenbach, E. Allwine, and T. Coons. 2010: A Multiscale and Multidisciplinary Investigation of Ecosystem-Atmosphere CO<sub>2</sub> Exchange over the Rocky Mountains of Colorado. *Bull. Amer. Meteor. Soc.*, **91**, 209-230.
19. **Clements, C. B.**, S. Zhong, X. Bian, W. E. Heilman, and D. W. Byun, 2008: First observations of turbulence generated by grass fires, *J. Geophys. Res.*, doi:10.1029/2008JD010014
20. Whiteman, C. D., A. Muschinski, S. Zhong, D. Fritts, S. W. Hoch, M. Hahnenberger, W. Yao, V. Hohreiter, M. Behn, Y. Cheon, **C. B. Clements**, T. W. Horst, and W. O. J. Brown, 2008: METCRAX 2006 - Meteorological experiments in Arizona's Meteor Crater. *Bull. Amer. Meteor. Soc.*, **89**, 1665-1680.
21. Zhong, S., J. Li, **C.B. Clements**, S. DeWekker, and X. Bian. 2008: A note on the forcing mechanisms for Washoe Zephyr - a daytime downslope wind phenomenon in the Great Basin east of the Sierra Nevada. *Journal of Applied Meteorology and Climatology*, Vol. 47(1). pp. 339–350.
22. **Clements, C. B.**, S. Zhong, S. Goodrick, J. Li, X. Bian, B.E. Potter, W. E. Heilman, J.J. Charney, R. Perna, M. Jang, D. Lee, M. Patel, S. Street and G. Aumann 2007: Observing the Dynamics of Wildland Grass Fires: FireFlux- A Field Validation Experiment. *Bull. Amer. Meteor. Soc.*, **88**(9), 1369-1382. *Featured on Cover*.
23. Zhong, S., H. In, and **C. B. Clements**, 2007: Impact of turbulence, land surface, and radiation parameterizations on simulated boundary layer properties in a coastal environment, *J. Geophys. Res.*, **112**, D13110, doi:10.1029/2006JD008274.
24. **Clements, C. B.**, B.E. Potter, S. Zhong, 2006: *In situ* Measurements of Water Vapor, Heat and CO<sub>2</sub> Fluxes within a prescribed Grass Fire. *International Journal of Wildland Fire*, **15**(3), 299-306.

25. Whiteman, C. D., B. Pospichal, S. Eisenbach P. Weihs, **C. B. Clements**, R. Steinacker, E. Mursch-Radlgruber, and M. Dorninger, 2004: Inversion breakup in small Rocky Mountain and Alpine basins. *J. Appl. Meteor.*, **43** (8), 1069-1082.
26. **Clements, C. B.**, C. D. Whiteman, J. D. Horel, 2003: Cold-air-pool structure and evolution in a mountain basin: Peter Sinks, Utah. *J. Appl. Meteor.*, **42** (6), 752-768.
27. **Clements, C. B.**, 1999: Mountain and Valley Winds of Lee Vining Canyon, Sierra Nevada, California, U.S.A. *Arctic, Antarctic, and Alpine Research*, Vol. 31(3), pp. 293-302.

## PAPERS IN PREPARATION

## BOOK CHAPTER

Clements, C.B., 2011: Effects of Complex Terrain on Extreme Fire Behavior, *Synthesis of Knowledge of Extreme Fire Behavior: Volume I for Fire Managers, PNW-GTR-854*, USDA, (Chapter 2).

## SELECTED CONFERENCE PRESENTATIONS AND ABSTRACTS (of ~80; \*Student Presenters)

1. Clifford\*, K.T., **C.B. Clements**, M. Voss (2010) WRF and Mass-Consistent Wind Model Applications for Wind Power Forecasting in California's Coastal Complex Terrain, A41F-0168 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
2. Kochanski, A, M. Jenkins, M., S.K. Krueger, J. Mandel, J., Beezley, **C.B. Clements** (2010) Evaluation of The Fire Plume Dynamics Simulated by WRF-Fire, NH41A-1470 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
3. Clements, C.B. D. Seto\*, W.E. Heilmann, 2010: The Grass Fires on Slopes Experiment. NH41A- 1483 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
4. Seto\*, D. C. Clements, J. Coen, 2010: Observations and Modeling of Fire-Induced Winds NH41A-1489 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
5. Virkkula, A., Levula, J., Pohja, T., de Leeuw, G., Schultz, D., **Clements, C.**, Kukkonen, J., Sofiev, M., Pirjola, L., Manninen, H. E., Junninen, H., Grönholm, T., Kulmala, M., 2010: The organization and initial results of a prescribed forest burning experiment in South-Western Finland in June 2009. *International Aerosol Conference*, 29 August- 3 Sept. Helsinki, Finland.
6. Clements, C.B. and A. Oliphant. An overview of the California State University- Mobile Atmospheric Profiling System (CSU-MAPS) for research and education in mountain meteorology. *AMS 14<sup>th</sup> Conference on Mountain Meteorology*, 30 Aug. – 2 Sept., Tahoe, California.
7. Clements, C. B., and W. E. Heilman. The Grass Fires on Slopes Experiment. *AMS 14<sup>th</sup> Conference on Mountain Meteorology*, 30 Aug. – 2 Sept., Tahoe, California.
8. Seto\*, D., **C. B. Clements**, and W.E. Heilman. Fire behavior observed during a valley wind reversal. *AMS 14<sup>th</sup> Conference on Mountain Meteorology*, 30 Aug. – 2 Sept., Tahoe, California.
9. Charland\*, A., **C. B. Clements**, and D. Seto, Observations of cold air pooling in a mountain valley. *AMS 14<sup>th</sup> Conference on Mountain Meteorology*, 30 Aug. – 2 Sept., Tahoe, California.
10. Bridger, A. F.C., **C. B. Clements**, and M. Voss, 2010, Creation of a new forecasting and measurement-intensive field course at SJSU. *19<sup>th</sup> Symposium on Education*, AMS Annual Meeting, Atlanta, GA, 17-21 January, 2010.
11. Padrick\*, S., **C. Clements**, D. Seto, 2009: A Case Study of Wind Resource Assessment on a High-Rise Building, *Eos Trans. AGU*, 90(52), *Fall Meet. Suppl.*, Abstract A31F-0195
12. Seto\*, D., C. Clements, S. Strenfel, W. Heilman, X. Bian. (2009: Fire Whirl Formation in Complex Terrain, *Eos Trans. AGU*, 90(52), *Fall Meet. Suppl.*, Abstract A43C-0249
13. Strenfel\*, S. **C. Clements**, F. Freedman, J.K. Hiers 2009 : Observed and Modeled Prescribed Fire Emissions and Transport *Eos Trans. AGU*, 90(52), *Fall Meet. Suppl.*, Abstract A51I-0225
14. Clements, C. B., J. Hiers, S. Strenfel, 2009 In situ Micrometeorological Measurements during RxCADRE *Eos Trans. AGU*, 90(52), *Fall Meet. Suppl.*, Abstract A43C-0248
15. Kiefer\*, C., **C. Clements**, B. Potter 2009: Observed Water Vapor Enhancement in Smoke Plumes, *AMS 9<sup>th</sup> Symposium on Fire and Forest Meteorology*, Kalispell, MT, 15-18 Oct. 2009.

16. Clements, C. B., C., Kiefer, B. E. Potter 2009: Use of a Mini-UAV Platform for In Situ Monitoring of Fire Plumes. *AMS 9<sup>th</sup> Symposium on Fire and Forest Meteorology*, Kalispell, MT, 15-18 Oct. 2009.
17. Clements, C. B. J. Kukkonen, G. de Leeuw, A. Virkkula, J. Levula, D. M. Schultz, and M. Kulmala, 2009: An Overview of Atmospheric Measurements made during the IS4FIRES Experiment at Hyytiälä, Finland. *AMS 9<sup>th</sup> Symposium on Fire and Forest Meteorology*, Kalispell, MT, 15-18 Oct. 2009.
18. Strenfel\*, S. C. Clements, K. Kiefer, J. K. Heirs 2009: Field Measurements of PM<sub>2.5</sub> and Carbon from Prescribed Fires. *AMS 9<sup>th</sup> Symposium on Fire and Forest Meteorology*, Kalispell, MT, 15-18 Oct. 2009.
19. Seto\*, D., C. Clements, W. Heilman, X. Bian 2009: Fire Whirl Formation during a Valley Wind Reversal, *AMS 9<sup>th</sup> Symposium on Fire and Forest Meteorology*, Kalispell, MT, 15-18 Oct. 2009.
20. Strenfel\*, S. C. Clements, K. Kiefer, J. K. Heirs, 2008: PM<sub>2.5</sub> and Carbon Emissions from Prescribed Fire in a Longleaf Pine Ecosystem, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., A51I-0209.
21. Kiefer\*, C., C. Clements, B. Potter, Strenfel, S., 2008: Water Vapor Enhancement in Prescribed Fire Plumes, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., A51I-0208
22. Clements, C. B., Haman, C., Lefer, B., Beals, C., 2008: Surface layer temperature structure observed at Summit, Greenland *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., A31G-0201
23. Haman, C., Lefer, B., Clements, C., Beals, C., Huey, G. Tanner, D. Liao, J., Brough, N., 2008: Impact of Boundary Layer Stability on Measured Halogen Levels, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., A51C-0112.
24. Clements, C. B., B. Rappenglück, R. Perna, B. Day, M. Patel, B. Lefer, and G. Morris. Evolution and Structure of the Urban Boundary Layer in Houston, *10<sup>th</sup> Conf. on atmos. chemistry*, New Orleans, LA 21-24 Jan, 2008.
25. Lefer, B., B. Rappenglueck, J. H. Flynn, W. T. Luke, and C. B. Clements 2008: Photochemical and meteorological conditions during the 2006 TexAQS II Radical and Aerosol Measurement Project (TRAMP), *10th Conference on atmospheric chemistry*, New Orleans, LA 21-24 January, 2008.
26. Clements, C. B., S. Zhong, W.E. Heilman, X. Bian 2007: Thermodynamic Structure of a Grass Fire Plume, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract A53A-0911
27. Day\*, B. M., C. B. Clements, B. Rappenglueck 2007: Observations of the Nocturnal Boundary Layer and Morning Transitional Periods in Houston, Texas during the TexAQS II Campaign, *Eos Trans. AGU*, 88(52), A51B-0348
28. Clements, C. B. (2007) An overview of the FireFlux experiment, *7<sup>th</sup> Conference on fire and forest meteorology*, Bar Harbor, ME, October 22-26, 2007
29. Keifer\*, C., C. B. Clements, B. Potter (2007) Plume moisture enhancement observed during FireFlux, *7<sup>th</sup> Conference on fire and forest meteorology*, Bar Harbor, ME, October 22-26, 2007
30. Clements, C. B., S. Zhong, W.E. Heilman, X. Bian, and S. Goodrick (2007) Turbulent kinetic energy and fire-induced winds observed during FireFlux, *7<sup>th</sup> Conf. fire and forest meteorology*, Bar Harbor, ME, Oct. 22-26, 2007
31. Day\*, B. M., C. B. Clements, B. Rappenglueck (2007), Nocturnal Boundary Layer Evolution in Houston during the TexAQS II Campaign. AMS, *Seventh symp. of the urban environment*, San Diego, CA 9-13 September, 2007.
32. Clements, C. B., Zhong, S., W. Yao, C.D. Whiteman, T. Horst, 2007: Slope flows observed during METCRAX. Preprints, *International Conference on Alpine Meteorology*, Chambéry, France, 4-8 June, 2007.
33. Clements, C.B. and S. Zhong, 2007: Plume Energetics and Dynamics of Grass Fires, *2<sup>nd</sup> Fire Behavior and Fuels Conference*, Destin, FL March 27-29 2007.
34. Clements, C.B., Zhong, S., Li, J., Goodrick, S., Bian, X., Heilman, W., Charney, J., Potter, B., Aumann, G., 2006: Turbulence and Dynamics of Wildland Grass Fires: The FireFlux Experiment, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract A11E-05
35. Zhong, S., C.B. Clements, J. Li, X. Bian, and S. DeWekker, 2007: Washoe Zephyr- a daytime downslope wind in the lee of the Sierra Nevada. *Preprints, 12<sup>th</sup> Conference on Mountain Meteorology*, August 28- Sept. 1, Santa Fe, NM.
36. Clements, C. B., B.E. Potter, S. Zhong, 2005: In-situ Measurements of Water Vapor, Heat and CO<sub>2</sub> Fluxes using a micrometeorological tower and tethered balloon system within a prescribed Prairie Fire. *Preprints, Joint Sixth Symp. on Fire and Forest Meteorology/19th Interior West Fire Council Meeting 25-27 October 2005 Canmore, AB, Canada*. \*Best Young Scientist Award

37. Clements, C.B. and Shiyuan Zhong, 2005: Daytime down-canyon winds in the eastern Sierra Nevada, California. *Preprints, 28th International Conference on Alpine Meteorology, Zadar, Croatia, May 23-27, 2005.*
38. Clements, C.B., S. Zhong, S-B. Kim, S. Kim, J.D. Burley, 2004: High-altitude ozone concentrations in Yosemite National Park, Sierra Nevada. *Preprints 13th Joint Conference on Applications on Air Pollution Meteorology with the Air and Waste Management Association, Vancouver, B.C., 22-27 August 2004, Amer. Meteor. Soc.*
39. Clements, C.B., S. Zhong, J.D. Burley, 2004: Thermally-driven wind systems and high-altitude ozone concentrations in Yosemite National Park. *Preprints, 11<sup>th</sup> Conference on Mountain Meteorology, 21-25 June 2004, Bartlett, NH.*
40. Clements, C.B., and Shiyuan Zhong, 2004: The role of the Topographic Amplification Factor in the breakup of nocturnal inversions in Yosemite Valley, Sierra Nevada. *Preprints, 11<sup>th</sup> Conference on Mountain Meteorology, 21-25 June 2004, Bartlett, NH.*
41. Grimmond C.S.B, H.-B. Su, B. Offerle, B. Crawford, S.Scott, S. Zhong, and **C. Clements**, 2004: Variability of sensible heat fluxes in a suburban area of Oklahoma City. *Preprints, The Symposium on Planning, Nowcasting, and Forecasting in the Urban Zone., Seattle, WA, 12-14 January 2004, Amer. Meteor. Soc.*
42. Whiteman, C.D., **C.B. Clements**, J. D. Horel, 2002: Turbulent and Radiative Flux Divergences in Cold Pools that form within a High Elevation Basin. *Preprints, 15th Symposium on Boundary Layer and Turbulence, Wageningen, The Netherlands, Amer. Meteor. Soc.*
43. McMeeking, G. R., C.D. Whiteman, S. Powell, **C. B. Clements**, 2002: Terrain and Ambient wind effects on the warming footprint of a wind machine. *Preprints, 24th Conference on Forest and Agricultural Meteorology, Norfolk, Virginia, Amer. Meteor. Soc.*
44. Clements, C. B., C. D. Whiteman, J. D. Horel, 2000: Observations of a Cold Air Pool in a Remote Mountain Basin. *Preprints, Ninth Conference on Mountain Meteorology, Aspen, CO, Amer. Meteor. Soc. Aug. 7-11, 2000. Best Student Oral Presentation*
45. Clements, C. B., 1998: Some Observations of Mountain and Valley Winds in the Sierra Nevada. *Preprints, Eighth Conference on Mountain Meteorology, Flagstaff, AZ, Amer. Meteor. Soc. 1998*

## INVITED TALKS

1. Micrometeorology of wildfires, Department of Geosciences, San Francisco State University, April, 4, 2011.
2. The Micrometeorology of Wildfires, Department of Civil and Environmental Engineering, U.C. Berkeley, 18 February 2011.
3. Grass Fires on Slopes Experiment, Santa Clara County Fire Safe Council Meeting, Los Altos, CA on 14 September 2010
4. Fire-Atmosphere interactions and plume dynamics, Department of Geography, San Francisco State University, April 22, 2009
5. Experimental studies of Fire-Atmosphere interactions and plume dynamics, Department of Meteorology, University of Utah, Feb 25, 2009.
6. In Situ Observations of Grass Fire Dynamics, NASA-Ames, Mountain View, CA, on 22 May 2008
7. In-Situ Measurements of Fire-Atmosphere Interactions, California Center for Innovative Transportation, UC Berkeley, CA on March 31, 2008
8. Wildfire Research at San Jose State University, presented at the Santa Clara County Fire Safe Council Meeting, Los Gatos, CA on 12 February 2008.
9. Tower and Sodar Measurements for Wind Energy Assessment, presented at Stanford Wind Energy Project Group Meeting at Stanford University, CA on 4 February, 2008
10. Observations of Fire-Atmosphere Interactions during Grass Fires, Lawrence Livermore National Laboratory, CA on 19 December 2007
11. Micrometeorological Measurements of Fire-Atmosphere Interactions during Grass Fires, Joseph. W. Jones, Ecological Research Center at Ichauway, GA, 19 March 2007.

## AWARDS AND HONORS

- 2012 NSF CAREER Award
- 2010 San José State University Research Foundation Early Career Investigator Award.
- 2006 Houston Advanced Research Center Graduate Scholar.
- 2005 Best Young Scientist Award, AMS Symposium on Fire and Forest Meteorology.

- 2005 Estwing Award for Outstanding Field Work, Department of Geosciences, University of Houston.
- 2004 Best Student Presentation Award, Department of Geosciences, University of Houston.
- 2001 Excellence in Graduate Research Award, Department of Meteorology, University of Utah.
- 2000 Best Student Oral Presentation Award, AMS Ninth Conference on Mountain Meteorology.
- 1999 U.S. Department of Energy, Graduate Research Environmental Fellowship (1999-2003).
- 1998 3<sup>rd</sup> Place Student Oral Paper, Climate Specialty Group, AAG Annual Meeting.
- 1998 Eastern Sierra Air & Waste Management Association Scholarship.
- 1997 2nd Place Student Oral Paper Award, California Geographic Society Meeting.
- 1994 University of Nevada Undergraduate Research Scholarship.
- 1990 3<sup>rd</sup> Place Intercollegiate Informative Speaking Award, Jack Samosky Invitational.

## **MEDIA INTERVIEWS**

- NBC-Local Bay Area, Feature story “Fighting wildfires with science,” aired 17 July 2011, by Rob Mayeda.
- *San Jose Mercury News*, interviewed and photographed for article highlighting wildfire research program at SJSU, “Fighting wildfires with scientific data, research and instruments,” by Lisa M. Krieger, 24, June 2010
- Interviewed for article in *San Jose Mercury News*, “Are fire dangers overstated?” by Paul Rogers, 2 June 2010.
- Interview regarding fire dynamics for The Weather Channel’s “*When Weather Changed History*” Documentary on the Great Chicago Fire, 2008.
- Interview on meteorological measurements used during fire research for Georgia Public Broadcast’s show “*Georgia Outdoors: Fire Ecology*”, 2008.

## **TEACHING EXPERIENCE**

### San José State University

| <b>Semester</b> | <b>Course</b> | <b>Title</b>                  | <b>Students</b> | <b>SOTE*</b> |
|-----------------|---------------|-------------------------------|-----------------|--------------|
| Fall 2013       | Metr 165      | Mountain Meteorology          | 25              |              |
| Spring 2013     | Metr 163      | Meteorological Instruments    | 15              | 4.8          |
| Spring 2013     | Metr 10       | Intro Weather & Climate       | 50              | 3.9          |
| Spring 2012     | Metr 172      | Mesoscale Meteorology         | 10              | 4.1          |
| Spring 2012     | Metr 163      | Meteorological Instruments    | 15              | 4.7          |
| Fall 2011       | Metr 164      | Intro to Fire Weather         | 11              | 4.1          |
| Fall 2011       | Metr 10       | Intro Weather & Climate       | 49              | 4.7          |
| Spring 2011     | Metr 112      | Global Climate Change         | 49              | 4.9          |
| Spring 2011     | Metr 163      | Meteorological Instruments    | 13              | 4.1          |
| Fall 2010       | Metr 10       | Intro Weather & Climate       | 49              | 4.8          |
| Fall 2010       | Metr 60       | Meteorology I                 | 16              | 4.4          |
| Fall 2010       | Metr 166      | Field Studies                 | 10              | n/a          |
| Spring 2010     | Metr 280      | Mountain Meteorology          | 5               | 4.8          |
| Spring 2010     | Metr 163      | Meteorological Instruments    | 9               | 4.2          |
| Fall 2009       | Metr 166      | Field Studies                 | 10              | 4.6          |
| Fall 2009       | Metr 112      | Global Climate Change         | 69              | 4.7          |
| Fall 2009       | Metr 10       | Intro Weather & Climate       | 46              | 4.7          |
| Spring 2009     | Metr 163      | Meteorological Instruments    | 15              | 4.1          |
| Spring 2009     | Metr 112      | Global Climate Change         | 50              | 4.9          |
| Fall 2008       | Metr 280      | Intro Air Quality Instruments | 4               | N/A          |
| Fall 2008       | Metr 112      | Global Climate Change         | 50              | 4.8          |
| Fall 2008       | Metr 10       | Intro Weather & Climate       | 38              | 4.4          |
| Spring 2008     | Metr 40       | Weather Seminar               | 6               | 4.8          |
| Spring 2008     | Metr 130      | Boundary Layer Met            | 11              | 4.1          |
| Spring 2008     | Metr 112      | Global Climate Change         | 50              | 4.9          |
| Fall 2007       | Metr 112      | Global Climate Change         | 45              | 4.8          |
| Fall 2007       | Metr 112      | Global Climate Change         | 57              | 4.7          |

University of Houston

|             |           |                     |   |     |
|-------------|-----------|---------------------|---|-----|
| Spring 2007 | Geol 6336 | Boundary Layer Met  | 7 | N/A |
| Fall 2004   | Geol 3178 | Weather Information | 6 | N/A |
| Spring 2004 | Geol 3178 | Weather Information | 6 | N/A |

\*SOTE=Student Opinion and Teaching Evaluation (out of 5.0).

## FIELD RESEARCH EXPERIENCE

Co-PI, RxCADRE (prescribed fire, combustion, atmospheric dynamics research experiments), 2008-2013

-Discipline Lead for all fire weather, micrometeorology, and fire-atmosphere interactions research.

Visiting Scientist, IS4FIRES Experiment, Hyytiälä, Finland, 15 May - 4 June 2009.

-conducted in situ measurements of micrometeorology of backing fire in slash fuels.

Field Scientist, Summit, Greenland: Halogen Snow Chemistry Measurement Campaign, 3-26 June, 2008.

-collected boundary layer data using tethered sonde and radiosonde systems, and a 50 m tower.

Site Scientist/Manager, University of Houston Boundary-Layer Meteorology Research Facility, La Marque, TX

- Constructed, maintained and operated 43-m flux tower and medium-range 3D Doppler Sodar.
- Responsible for bidding, contracting, installation and purchasing of facilities equipment.
- Data acquisition system design and data quality assurance, instrument repair and maintenance.

Lead-Field Scientist, University of Houston, TexAQS-II Air Quality Field Campaign, Houston, TX, Aug-Oct 2006.

- Managed and maintained micrometeorological flux measurements at UH Coastal Center.
- Initiated the operations and management of daily radiosonde launches from the UH campus.
- Managed operations and maintenance of remote mobile radiosonde launches during campaign.
- Managed and conducted tethered balloon measurements in downtown Houston.

Lead-Field Scientist, University of Houston, Terrain-induced Rotor Experiment, Bishop, California, March-May 2006.

-Installed and maintained Doppler Sodar and micrometeorological flux tower.

Principle Investigator, The FireFlux Experiment

- Independently designed and implemented experimental research on turbulence structures during intense grass fires.

Co-Principle Investigator, Ozone Transport and Wind Structure Study in Yosemite National Park, California (2003)

- Installed and operated UH Doppler sodar system, multiple meteorological towers, and operated Ozone monitors.
- Conducted high-resolution numerical simulations using MM5 modeling system.

Lead-Field Scientist, University of Houston Group, Joint Urban 2003 Dispersion Experiment Oklahoma City, OK

- Installed and maintained UH 3D Doppler Sodar, flux towers

Field Scientist, Pacific Northwest National Laboratory, Richland, Washington: Columbia Basin Vineyard Experiments,

- conducted tethered sonde and tower measurements over vineyards during summer.

Field Scientist, Intermountain Precipitation Experiment (IPEX) Utah.

Conducted remote soundings using the National Severe Storms Laboratory mobile unit, NSSL4, (February 2000).

Co-Principle Investigator, The Role of Slope Flows on the Evolution of Cold Air Pools in Basins.

M.S. thesis work conducted in cooperation with the U.S. Department of Energy (1999-2000).

Principle Investigator, A study on mountain-valley winds in Yosemite National Park

- Obtained funding for and designed and implemented research on mountain and valley wind studies of the Sierra Nevada. Various field experiments conducted both winter and summer seasons (1994-1998).
- Conducted first tethered sonde measurements in Yosemite National Park

Principle Investigator, Established a network of weather stations along a transect of Tioga Pass, Sierra Nevada.



Collected wintertime climatological data for Mono Basin inversion study (1995).

## UNIVERSITY AND DEPARTMENTAL SERVICE

|   |                      |
|---|----------------------|
| Department Student Recruitment  | 2007-present         |
| Department Curriculum Committee   | 2007-present         |
| Department Faculty Hiring Committee   | 2007-2008, 2010-2011 |
| College of Science Research Committee                                       | 2007-2008, 2010-2011 |
| College of Science Safety Committee   | 2011-2012            |
| Faculty advisor, SJSU Student Chapter<br>of American Meteorological Society | 2007- 2012           |

## ADVISING AND STAFF MANAGEMENT

### Post-Doctoral Mentoring

Dr. Neil Lareau, University of Utah, Atmospheric Science, (2013-present)

### Research Staff

Daisuke Seto, Research Associate (2012-present)

### Current Graduate Students

Jonathan Contezac, (2011-present)  
Dianne Hall, (2011-present)  
Braniff Davis, (2012-present)  
Richard Bagley (2013-present)  
Matt Lloyd (2013-present)  
Carrie Bowers (2014-present)

### Graduated M. S. Students

Daisuke Seto, Thesis: Fire-induced winds and turbulence (2009-2012)  
Allison Charland, Thesis topic: Lidar measurements of wildland fire plumes (2010-2012)  
Kevin Clifford (M.S. 2011) WRF modeling of wind energy assessment in Central California  
Caroline Kiefer (M.S. 2010), Thesis: Measurement of Moisture Enhancement in Fire Plumes Using UAV  
Scott Strenfel (M.S. 2010), Thesis: Emissions of PM<sub>2.5</sub> and Black Carbon from Prescribed Fires

### M.S. thesis committee member for the following students

David Bylow, Geography, San José State University, Graduated 05/2012  
Bridget Day, University of Houston, Graduated 01/2009  
Nicholas Guy, San José State University, Graduated 08/2008  
Monica Patel, University of Houston, Graduated 05/2008

## COMMUNITY SERVICE AND SYNERGISTIC ACTIVITIES

- Member, National Wildfire Coordinating Group, Fire Weather Subcommittee. 07/2009-Present
- Member, American Meteorological Society, Measurements Committee, 12/2009-present
- Member, WRF-FIRE steering committee, 11/2009-present
- Instructor, San Jose City Fire Department, S-290 Intermediate Wildland Fire Behavior, 2010
- Session Convener, American Geophysical Union 2010 Fall Meeting, Wildfire Dynamics Session.
- Session Convener, American Geophysical Union 2009 Fall Meeting, Wildfire Dynamics Session.
- Reviewer for *National Science Foundation*, *Journal of Geophysical Research*, *Journal of the Atmospheric Sciences*, *Atmospheric Chemistry and Physics*, *Journal of Applied Meteorology*, *Monthly Weather Review*, *International Journal of Wildland Fire*, *Climate Research*, and *Environmental Modelling & Software*
- Mentored a Westmont High School senior, Shayan Aminilari, for his Senior Project on “Building a solar powered battery charging backpack.” 2008
- In-School Mentor, *Big Brothers of Greater Vancouver*, King George High School, 2002-2003.
- Guest Speaker, 5<sup>th</sup> grade science class, Montevideo School, San Ramon, CA 2000

- Graduate Student Society, Department of Geography Representative, University of British Columbia, 2002
- Department of Meteorology Graduate Representative, University of Utah Student Advisory Committee, 1999.
- Founder and President of the University of Nevada Student Geographic Society, 1993-1995.

## **PROFESSIONAL MEMBERSHIPS**

American Meteorological Society

American Geophysical Union

International Association of Wildland Fire