

## JANICE L. COEN

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### EDUCATION

1992 Ph.D., Dept. of the Geophysical Sciences, The University of Chicago, Chicago, IL  
1988 M.S., Dept. of the Geophysical Sciences, The University of Chicago, Chicago, IL  
1986 B.S., Engineering Physics, magna cum laude, Grove City College, Grove City, PA

### PROFESSIONAL RECORD

2018- Project Scientist III, NCAR, Mesoscale & Microscale Meteorology Laboratory  
2016-2017 Consultant, expert witness on weather-related wildfire issues and wind speed analysis for Utility Consumers' Action Network (UCAN)  
2002- Project Scientist II, NCAR, Mesoscale & Microscale Meteorology Laboratory  
NCAR's Wildland Fire Initiative: Science Lead (2002-2004), Initiative Co-lead (2004-2006)  
2001-2002 Project Scientist I, NCAR, Joint appointment: MMM/Research Applications Program  
1996-2001 Associate Scientist III, NCAR, Mesoscale & Microscale Meteorology Division  
1994-1996 Associate Scientist II, NCAR, Mesoscale & Microscale Meteorology Division  
1992-1994 Scientific Visitor, NCAR, Mesoscale & Microscale Meteorology Division

### GRANTS

Coen has served as PI or in another leadership role in 12 funded multi-institutional, interdisciplinary projects (\$2.5M to NCAR; \$6.3M total).

### HONORS AND AWARDS

2017 High Performance and Distributed Computing Conference, Keynote presentation  
2016 Supercomputing 2016, Invited presentation  
2010 Wildland Fire Litigation Conference, Keynote presentation  
2009 Intl. Conference on Computational Science, Keynote presentation  
2005 Nomination of paper, 'Infrared imagery of crown-fire dynamics during FROSTFIRE', for NCAR Outstanding Publication Award  
1989-1992 NASA Graduate Student Researchers Program Fellowship  
1986-1989 McCormick Fellowship, University of Chicago

### REFEREED PUBLICATIONS

Coen, J. L. Some requirements for simulating wildland fire behavior using insight from coupled weather-wildland fire models. *Fire*, 1, 6.  
Coen, J. L., E. N. Stavros, and J. A. Fites-Kaufman 2018: Deconstructing the King megafire. *Ecological Applications*. <https://esajournals.onlinelibrary.wiley.com/doi/10.1002/eap.1752>  
Stavros, E. N., J. Coen, B. Peterson, H. Singh, K. Kennedy, C. Ramirez, D. Schimel, 2017: Use of imaging spectroscopy and LIDAR to characterize fuels for fire behavior prediction. *Remote Sensing Applications: Society and Environment*. <https://doi.org/10.1016/j.rsase.2018.04.010>  
Muñoz-Esparza, D., B. Kosović, P. A. Jiménez, J. L. Coen. An accurate fire-spread algorithm in the Weather Research and Forecasting model using the level-set method. *J. Advances in Modeling Earth Systems*. *J. Advances in Modeling Earth Systems*, 10. <https://doi.org/10.1002/2017MS001108>.  
Coen, J. L., W. Schroeder, S. Rudlosky, 2018: Transforming Wildfire Detection and Prediction using New and Underused Sensor and Data Sources Integrated with Modeling. *Proc. Infobotics/DDDAS*

- Conference. Hartford, CT, Aug 9-12, 2016. Chapter 12 in Handbook of Dynamic Data Driven Application Systems. E. P. Blasch, S. Ravela, and A. Aved, Eds. 16 pp. Springer. Accepted.
- Coen, J. L. and W. Schroeder, 2017: Coupled Weather-Fire Modeling: from Research to Operational Forecasting. *Fire Management Today* 75:39-45.
- Powers, J. G., J. B. Klemp, W. C. Skamarock, C. A. Davis, J. Dudhia, D. O. Gill, J. L. Coen, D. J. Gochis, R. Ahmadov, S. E. Peckham, G. A. Grell, J. Michalakes, S. Trahan, S. G. Benjamin, C. R. Alexander, G. J. DiMego, W. Wang, C. S. Schwartz, G. S. Romine, Z. Liu, C. Snyder, F. Chen, M. J. Barlage, W. Yu, M. G. Duda, 2017: The Weather Research and Forecasting (WRF) Model: Overview, System Efforts, and Future Directions. *Bull. Amer. Meteor. Soc.* 98:1717-1737.
- Coen, J. L. and W. Schroeder, 2015: The High Park Fire: Coupled weather-wildland fire model simulation of a windstorm-driven wildfire in Colorado's Front Range. *J. Geophys. Res. Atmos.*, 120:131-146.
- Coen, J. L. and P. J. Riggan, 2014: Simulation and thermal imaging of the 2006 Esperanza wildfire in southern California: Application of a coupled weather-wildland fire model. *Intl. J. Wildland Fire*, 23:755-770.
- Coen, J. L. and W. Schroeder, 2013: Use of spatially refined remote sensing fire detection data to initialize and evaluate coupled weather-wildfire growth model simulations. *Geophys. Res. Lett.*, 40:1-6.
- Coen, J. L., M. Cameron, J. Michalakes, E. G. Patton, P. J. Riggan, and K. M. Yedinak, 2013: WRF-Fire: Coupled Weather-Wildland Fire Modeling with the Weather Research and Forecasting Model. *J. Appl. Meteor. Climatol.*, 52:16-38.
- Coen, J. L., 2014: Wildfire Weather. Encyclopedia of Atmospheric Sciences, 2nd Ed. G. North, F. Zhang, and J. Pyle, eds. Academic Press.
- Coen, J. L., 2011: Some new basics of fire behavior. *Fire Management Today*, 71:37-42.
- Coen, J. L. and C. C. Douglas, 2010: Computational Modeling of Large Wildfires: A Roadmap. 9th Intl. Symp. on Distributed Computing and Applications To Business, Engineering & Science (DCABES). August 10-12, Lingnan Univ., Hong Kong. Proceedings. 5 pp.
- Mandel, J., Beezley, J., Coen, J., Kim, M., 2009: Data assimilation for wildland fires: Ensemble Kalman Filters in coupled atmosphere-surface models. *IEEE Control Systems Magazine*, 29:47-65.
- Mandel, J., L. S. Bennethum, J. D. Beezley, J. L. Coen, C. C. Douglas, M. Kim, A. Vodacek, 2008: A wildland fire model with data assimilation. *Math. and Computers in Simulation*, 78:584-606.
- Wang, Z., Coen, J., Vodacek, A., 2008: Generation of synthetic infrared remote sensing scenes of wildland fire. *Intl. J. Wildland Fire*, 18:302-319.
- Coen, J. L., 2005: Simulation of the Big Elk Fire using coupled atmosphere-fire modeling. *Intl. J. Wildland Fire*, 14:49-59.
- Clark, T. L., J. L. Coen, and D. Latham, 2004: Description of a Coupled Atmosphere-Fire Model. *Intl. J. Wildland Fire*, 13:49-63.
- Coen, J. L., S. Mahalingam, and J. W. Daily, 2004: Infrared imagery of crown-fire dynamics during FROSTFIRE. *J. Appl. Meteor.*, 43:1241-1259.
- Coen, J. L., 2003: Wildfire Weather. Encyclopedia of Atmospheric Sciences, J. Holton, J. Pyle, and J. Curry, eds. Academic Press.
- Jenkins, M. A., T. Clark, and J. Coen, 2001: Coupling Atmospheric and Fire Models. Chapter 7, in Forest Fires: Behavior and Ecological Effects. Academic Press. E. A. Johnson and Kiyoko Miyaniishi, eds. 600 pp.
- Radke, L. R., T. L. Clark, J. L. Coen, C. Walther, R. N. Lockwood, P.J. Riggan, J. Brass, and R. Higgins, 2000: The WildFire Experiment (WiFE): Observations with airborne remote sensors. *Can. J. Rem. Sens.*, 26:406-417.
- Reinking, R. F., J. B. Snider, and J. L. Coen, 2000: Influences of storm-embedded orographic gravity waves on cloud liquid water and precipitation. *J. Appl. Meteor.*, 39:733-759.
- Clark T. L., L. F. Radke, J. L. Coen, D. Middleton, 1999: Analysis of Small-Scale Convective Dynamics in a Crown Fire Using Infrared Video Camera Imagery. *J. Appl. Meteor.*, 38:1401-1420.

- Clark, T. L., T. Keller, J. Coen, P. Neilley, H. Hsu and W. D. Hall, 1997: Terrain-induced Turbulence over Lantau Island: 7 June 1994 Tropical Storm Russ Case Study. *J. Atmos. Sci.*, 54:1795-1814.
- Clark, T. L., M. A. Jenkins, J. Coen and David Packham, 1996: A Coupled Atmospheric-Fire Model: Convective Feedback on Fire Line Dynamics. *J. Appl. Meteor.*, 35, 875-901.
- Clark, T. L., M. A. Jenkins, J. Coen and David Packham, 1996: A Coupled Atmospheric-Fire Model: Convective Froude number and Dynamic Fingering. *Intl. J. Wildland Fire*, 6:177-190.
- Srivastava, R. C. and J. L. Coen, 1993: Reply (to Comments of M. Kulmala). *J. Atmos. Sci.*, 50:4104-4106.
- Coen, J. L., 1992: A numerical study of the microburst downdraft and outflow: The interaction of precipitation microphysics and dynamics. Ph.D. dissertation, Univ. of Chicago. 151 pp.
- Srivastava, R. C., and J. L. Coen, 1992: New explicit equations for the accurate calculation of the growth and evaporation of hydrometeors by the diffusion of water vapor. *J. Atmos. Sci.*, 49:1643-1651.

### NONREFEREED PUBLICATIONS

- Coen, J. L., 2015: Distilling and disseminating new scientific understanding of wildland fire phenomena and unfolding of large wildfires to prevent wildland firefighter entrapment. Proc. 13th Intl. Wildland Fire Safety Summit & 4th Human Dimensions of Wildland Fire Conf. Apr. 20-24, 2015, Boise. Published by the Intl. Assn. of Wildland Fire.
- Coen, J. L., 2013: Modeling Wildland Fires: A Description of the Coupled Atmosphere-Wildland Fire Environment Model (CAWFE). NCAR Technical Note NCAR/TN-500+STR. 38 pp.
- Coen, J., 2010: Dry lightning. *Southern California Fire Journal*, 1:1-12.
- Coen, J. L. and P. J. Riggan, 2010: Landscape-Scale Wildland Fire Modeling: Research & Applications. Proc. AFAC and Bushfire CRC Conf. Darwin, Sept. 8-10. 11 pp.
- Coen, J. L., J. Daily, S. Mahalingam, 2010: Application of infrared imagery for understanding wildfire dynamics. *Inframation 2010*. 15 pp.
- Coen, J. L. and P. J. Riggan, 2010: A landscape-scale wildland fire study using a coupled weather-wildland fire model and airborne remote sensing. Proc. 3rd Fire Behavior & Fuels Conf., Oct. 25-29, Spokane, Intl. Assn. Wildland Fire, Birmingham. CD-ROM. 12 pp.
- Riggan, P. J., L. G. Wolden, R. G. Tissell, J. Coen, 2010: Remote sensing fire and fuels in Southern California. Proc. 3rd Fire Behavior & Fuels Conf., Oct. 25-29, Spokane, Intl. Assn. Wildland Fire, Birmingham. CD-ROM. 14 pp.
- Yedinak, K. M., B. Lamb, and J. L. Coen, 2010: Sensitivity analyses and application of WRF-Fire. Proc. 3rd Fire Behavior & Fuels Conf., Oct. 25-29, Spokane, Intl. Assn. Wildland Fire, Birmingham. CD-ROM. 11 pp.
- Beezley, J. D., S. Chakraborty, J. L. Coen, C. C. Douglas, J. Mandel, A. Vodacek, Z. Wang, 2008: Real-time data driven wildfire modeling. Intl. Conf. on Computer Science. Krakow. 8 pp.
- Coen, J., 2008: Deadly fingers of flame. *Southern California Fire Journal*, 1:5-6.
- Mandel, J., J. D. Beezley, S. Chakraborty, J. L. Coen, C.C. Douglas, and A. Vodacek: 2008: Towards a real-time data driven wildland fire model. 22nd IEEE Intl. Parallel and Distributed Processing Symposium. Apr. 14-18, Miami. 5 pp.
- Coen, J. L., J. D. Beezley, L. S. Bennethum, C. C. Douglas, M. Kim, R. Kremens, J. Mandel, G. Qin, and A. Vodacek, 2007: A wildland fire dynamic data-driven application system. Preprints 11th Symp. on Integrated Observing and Assimilation Systems, Amer. Meteor. Soc., Jan. 14-17, San Antonio. CD-ROM Paper 3.12.
- Coen, J. L., 2006: Multiple fire interactions. Preprints 5th Intl. Conf. on Forest Fire Research. Coimbra, Portugal. Nov. 27-30. 12 pp.
- Douglas, C. C., J. D. Beezley, J. Coen, R. E. Ewing, Y. Efendiev, G. Haase, M. Iskandarani, M. Kritz, R. A. Lodder, J. Mandel, G. Qin, A. Vodacek, 2006: DDDAS Approaches to wildland fire modeling and contaminant tracking. Proc. Winter Simulation Conf., Dec. 3-6, Monterey. 8 pp.
- Hacker, J., J. Coen, and J. Michalakes, 2006: A Mesoscale Nature Run for Predictability, Turbulence, and Parameterization Studies. WRF User's workshop. P7.2. 2 pp.

- Douglas, C. C., J. D. Beezley, J. Coen, D. Li, W. Li, A. K. Mandel, J. Mandel, Guan Qin, A. Vodacek, 2006: Demonstrating the validity of a wildfire DDDAS. Preprints 6th Intl. Conf. on Computer Science. May 28-31, Reading, UK, 8 pp.
- Coen, J. L., 2005: Applications of coupled atmosphere-fire modeling: Prototype demonstration of real-time modeling of fire behavior. Amer. Meteor. Soc. Joint 6th Symp. on Fire & Forest Meteor./Interior West Fire Council Conf. Oct. 25-27, Canmore, AB, Canada. CD-ROM, Paper 8.1.
- Mandel, J. L. S. Bennethum, M. Chen, L. P. Franca, C. Johns, J. L. Coen, C. C. Douglas, M. Kim, A. V. Knyazev, R. Kremens, V. Kulkarni, G. Qin, A. Vodacek, J. Wu, W. Zhao, A. Zornes, 2005: Towards a dynamic data driven application for wildfire simulation. Lecture Notes in Computer Science. V.S. Sunderam, G. D. van Albada, P. M. A. Sloot, eds. Springer-Verlag, 3515:632-639. ISBN 3-540-26043-9. Computational Science - ICCS 2005: Proc. 5th Intl. Conf. Atlanta, May 22-25, Part II.
- Mandel, J., M. Chen, L. P. Franca, C. Johns, A. Puhalski, J. L. Coen, C. C. Douglas, R. Kremens, A. Vodacek, W. Zhao, 2004: A note on dynamic data driven wildfire modeling. 4th Intl. Conf. on Computer Science - ICCS 2004, Krakow, Poland, Jun. 6-9. In V. 3038 of Lecture Notes in Computer Science. M. Bubak, G. D. van Albada, P. M. A. Sloot, J. J. Dongarra, eds. Springer Publishers. 725-731. ISBN: 3-540-22116-6.
- Patton, E. G. and J. L. Coen, 2004: WRF-Fire: A coupled atmosphere-fire module for WRF. Preprints Joint MM5/Weather Research and Forecasting Model Users' Workshop. Jun. 22-25. Boulder. 221-223.
- Coen, J. L., 2003: Book Review of "Burning Questions: America's fight with Nature's Fire, by David Carle". The Environment. 45:36.
- Coen, J. L., 2003: Infrared imagery applied for insights into wildland fire dynamics. Preprints, 5th Symp. Fire & Forest Meteorology/2nd Intl. Fire Ecology and Fire Management Congress, Orlando, FL, Amer. Meteor. Soc., CD-ROM, J2.9.
- Coen, J. L., 2003: Simulation of wildfire incidents using coupled atmosphere-fire modeling. Preprints, 5th Symp. Fire & Forest Meteorology/2nd Intl. Fire Ecology and Fire Management Congress, Orlando, FL, Amer. Meteor. Soc., CD-ROM, J2.4.
- Rife, D. L., T. T. Warner, Y. Liu, and J. Coen, 2003: New methods for providing high resolution weather information to wildfire managers. Preprints, 5th Symp. Fire & Forest Meteorology/2nd Intl. Fire Ecology and Fire Management Congress, Orlando, FL, Amer. Meteor. Soc., CD-ROM, 2.8.
- Coen, J. L., 2001: Wildfire Research at NCAR: Wildfire simulations, observations of fire dynamics, and applications for hazard management. 3rd Intl. Conf. Geospatial Information in Agriculture and Forestry. Denver, Nov. 5-7. 4 pp.
- Clark, T. L., W. D. Hall, and J. L. Coen, 1996: Source Code Documentation for the Clark-Hall Cloud-scale Model Code Version G3CH01. NCAR Technical Note NCAR/TN-426+STR.

## **INVITED PRESENTATIONS**

- 2017 High Performance and Distributed Computing 2017. "Using Scientific Computing to Advance Wildland Fire Monitoring and Prediction."
- 2017 Stanford University. "Analysis, Monitoring, and Prediction of Wildland Fires."
- 2016 Supercomputing 2016. "Advances and Challenges in Wildland Fire Monitoring and Prediction".
- 2016 Wildland Fire Litigation Conference. "Using coupled weather-wildland fire modeling to understand events and attribute cause".
- 2013 Wildland Fire Litigation Conference. "Coupled Weather-Wildland Fire Models: Simulating Wildfire Events, Fire Phenomena, and Interactions between Fires".
- 2013 Society for Range Management Annual Meeting. "Coupled weather-wildland fire behavior models from the microscale to mesoscale"
- 2012 Wildland Fire Litigation Conference. "Modeling Weather, Wildfire Growth and Behavior, Weather-Fire Interactions, and Interactions between Fires"

- 2011 Geoscience Australia. “Landscape-scale wildland fire research and hazard management applications”.
- 2011 Australian Bureau of Meteorology. “Coupled weather-fire modeling of landscape-scale wildland fires: Research and applications”.
- 2010 NCAR Junior Faculty Forum. “Coupled Weather-Fire Modeling across scales for Biomass Emissions”.
- 2010 San Diego State Univ., Dept. of Geography. “A Short Course on Coupled Weather Fire Modeling”.
- 2010 Wildland Fire Litigation Conference. “Weather Modeling, Fire Spread Modeling, Fire-Weather Interaction: Operative Weather Analysis- Esperanza and other Case Studies” (keynote)
- 2009 2nd International Conference on High Performance Computing and Applications (HPCA2009), Shanghai Univ. “Wildfire Science and Computational Modeling”.
- 2009 Intl. Conference on Computational Science. “Computational Modeling of Wildland Fire Behavior and Weather for Research and Forecasting.” (keynote)
- 2009 NCAR Institute for Mathematics Applied to Geosciences (IMAGE) NCAR – Wyoming Days workshop. “Wildfire Science and Modeling”.
- 2009 Wildland Fire Litigation Conference. “Fire Behavior and Interactions with Weather: Basics, Knowns, and Unknowns”.

### **PROFESSIONAL ACTIVITIES**

- 2017 Project Technical Panel, Natl. Fire Protection Assn. Report, *Open Multi-Physics Framework for Modelling Wildfire Urban Evacuation*.
- 2017 Contributor, Assembly of the Republic of Portugal, Independent Technical Committee Report, *Analysis and Determination of the Facts Related to the Indents that Occurred in Pedrogao Grande, Castanheira de Pera, Ansiao, Alvaiazere, Figueiro dos Vinhos, Arganil, Gois, Penela, Pampilhosa da Serra, Oleiros and Serta, between June 17 and 24, 2017*
- 2016-2017 Editorial Board, Environmental Modelling and Software
- 2014-2015 Colorado Aerial Firefighting Center of Excellence Vision/Focus Subcommittee member
- 2010-2013 Editorial Board, E-Journal of Severe Storms Meteorology
- 2010-2016 Released WRF-Fire as part of WRF community model release; develop, maintain, support, and teach in semi-annual NCAR tutorials
- 2009-2010 Co-Convener Wildfire Dynamics Session, AGU 2009 and 2010 Fall Meetings
- 2007-2017 Associate Editor, International Journal of Wildland Fire
- 2007-2009 Board of Directors, International Association of Wildland Fire
- 2006-2007 Office of Federal Coordinator for Meteorology (OFCM) National Wildland Fire Weather Needs Assessment Joint Action Group (JAG) member
- 2004-2005 Steering Committee, The Institute for Multidisciplinary Earth Studies (TIMES)
- 2002-2006 Natl. Computational Science Alliance Allocations Board / Natl. Resource Allocations Committee
- 2002-2003 Fire Research Coordination Council
- 2000 NSF Dynamic Data Driven Application Workshop (invited)
- 1996 Group leader, Arizona Case Study, 4th Intl. Cloud Modeling Workshop
- 1994-1997 Organizer and Instructor in the Clark-Hall Model Workshop, NCAR
- 1992-1994 Member, Atmospheric Radiation Measurement Program Science team

### **PROFESSIONAL MEMBERSHIP**

International Association of Wildland Fire