Christopher A. Davis

**Mailing Address**

NCAR, Box 3000, Boulder, CO 80307–3000

Phone: 303 497–8990; Fax: 303 497–8181; Email: cdavis@ucar.edu

Education

1990 Ph.D. in Meteorology, Massachusetts Institute of Technology, Cambridge, MA

1985 B.S. in Physics, University of Massachusetts, Amherst, MA

**Professional Record**

2019 NCAR Senior Advisor

2015 – present NCAR Associate Director for the Mesoscale and Microscale Meteorology (MMM) Laboratory

2010 – 2015 Director, NCAR Advanced Study Program

2009 – 2010 Interim Deputy Division Director, MMM

2006 – present Senior Scientist, NCAR

2003 – 2010 Group Head, Prediction Diagnostics Group, Mesoscale and Microscale Meteorology Division

2002 – 2003 Deputy Group Head, Prediction Diagnostics Group, Mesoscale and Microscale Meteorology Division

2002 – present Adjunct Faculty Member, Texas A&M University

2000 – present Adjunct Faculty Member, Colorado State University

1999 – present Adjunct Faculty Member, North Carolina State University

1999– 2006 Scientist III, NCAR

1998 – 2002 Deputy Group Head, Mesoscale Prediction Group, Mesoscale and Microscale Meteorology Division

1995 –1999 Scientist II, NCAR

1992–1995 Scientist I, NCAR

1990–1992 Postdoctoral Research Fellow, Advanced Study Program, NCAR

1988–1989 Research Assistant, MIT

Honors and Awards

2018 Joanne Simpson Mentorship Award (AMS)

2015 American Meteorology Society Fellow

2010 UCAR Technology Award

2009, 2013, 2014 Nomination for UCAR Outstanding Publication Prize

2008 UCAR Mentoring Award

2007 Symons Memorial Lecturer

2006 NASA Pecora Award (TOMS Science Team)

2005 UCAR Outstanding Publication Prize

2003 MMM Outstanding Publication Certificate

2001 UCAR Technology Award

2000 MMM Outstanding Publication Certificate

1994 First Place, Faculty/Staff, National Collegiate Weather Forecasting Contest; Second Place Overall

1993 UCAR Outstanding Publication Prize

1990–1992 ASP Postdoctoral Fellowship

Professional Activities

2020–present Chair, World Weather Research Programme Science Steering Committee

2018–present Member, World Weather Research Programme Science Steering Committee

2018–present Member, Developmental Testbed Center Management Board

2016-17 Co-Chair, AMS Annual Meeting, Seattle Washington

2014 Co–Chair: Tropical Cyclones and Tropical Convection, World Weather Open Science Conference, Montreal

2011–2015 Associate Editor, *Quarterly Journal of the Royal Meteorological Society*

2009 Chair, NCAR Workforce Management Plan Subcommittee on Staff and Visitor Balance

2009–present Member, SOARS steering committee

2008—2012 Member, science steering committee for PRE–Depressions Investigation of Cloud systems in the Tropics (PREDICT) field program

2006 – 2011 Member, Steering Committee for Short–Term Explicit Prediction (STEP) program

2006 Co–Chair, Second International Conference on Quantitative Precipitation Forecasting and Hydrology

2005 – 2014 SOARS science mentor

2005 – 2010 Member, NCAR Water Cycle Steering Committee

2004 – 2007 Member, SCD Advisory Panel

2004 – 2005 Member, program committee for 11th AMS Conference on Mesoscale Processes

2000 – 2005 Co–Science Director of the *Bow Echo and MCV Experiment* (BAMEX)

2000 – 2009 Lead of WRF Testing and Evaluation working group (WG7)

1999 Chair, 8th AMS Conference on Mesoscale Processes. Boulder, CO.

1996–1998 Chair, AMS Mesoscale Committee

1994–2002 Associate Editor, *Monthly Weather Review*

1995–1996 Member USWRP, PDT’s 2 and 8

1993–1998 Member, AMS Mesoscale Committee

1993–1995 Chair, Division Equity Committee, MMM Division, NCAR

1992–Present Member, AMS

Teaching Experience

2020 Instructor for ATMO 580 (Tropical Meteorology), University of Arizona

1988Synoptic Lab Instructor, Massachusetts Institute of Technology

Publications – Refereed

1. Sanders, F. and C.A. Davis, 1988: Patterns of thickness anomaly for explosive cyclogenesis over the west–central North Atlantic Ocean. *Mon. Wea. Rev.*, **116**, 2727–2730.
2. Davis, C.A. and K.A. Emanuel, 1988: Observational evidence for the influence of surface heat fluxes on rapid maritime cyclogenesis. *Mon. Wea. Rev.*, **116**, 2649–2659.
3. Davis C.A. and K.A. Emanuel, 1991: Potential vorticity diagnostics of cyclogenesis. *Mon. Wea. Rev.*, **119**, 1930–1953.
4. Davis, C.A., 1992: Piecewise potential vorticity inversion. *J. Atmos. Sci.*, **49**, 1397–1411.
5. Davis, C.A., 1992: A potential vorticity diagnosis of the importance of initial structure and condensational heating in observed extratropical cyclogenesis. *Mon. Wea. Rev.*, **120**, 2409–2428.
6. Rivest, C., C.A. Davis, and B.F. Farrell, 1992: Upper–tropospheric synoptic–scale waves. Part I: Maintenance as eady normal modes. *J. Atmos. Sci.*, **49**, 2108–2119.
7. Davis, C.A., 1992: Comments on decomposing the atmospheric flow using potential vorticity framework. *J. Atmos. Sci.*, **50**, 2065–2067.
8. Davis, C.A., M.T. Stoelinga, and Y.–H. Kuo, 1993: The integrated effect of condensation in numerical simulations of extratropical cyclogenesis. *Mon. Wea. Rev.*, **121**, 2309–2330.
9. Whitaker, J.S., and C.A. Davis, 1994: Cyclogenesis in a saturated environment. *J. Atmos. Sci.*, **51**, 889–907.
10. Davis, C. A., and M. L. Weisman, 1994: Balanced dynamics of mesoscale vortices produced in simulated convective systems. *J. Atmos. Sci.*, **51**, 2005–2030.
11. Davis, C.A., 1995: Observations and modeling of a mesoscale cold surge during WISPIT. *Mon. Wea. Rev.* **123**, 1762–1780.
12. Davis, C.A., E.D. Grell, and M.A. Shapiro, 1996: The balanced dynamical nature of a rapidly intensifying oceanic cyclone. *Mon. Wea. Rev.,* **124**, 3–26.
13. Davis, C.A., 1997: The modification of baroclinic waves by the Rocky Mountains. *J. Atmos. Sci.,* **54**, 848–868.
14. Davis, C.A., 1997: Mesoscale anticyclonic circulations in the lee of the central Rocky Mountains. *Mon. Wea. Rev.*, **125**, 2838–2855.
15. Hartley, D., J. Villarin, R. Black and C. Davis, 1997: A new perspective on the dynamical link between the stratosphere and troposphere. *Nature,* **391**, 471–474.
16. Manning, K.W., and C.A. Davis, 1997: Verification and sensitivity experiments of the WISP–94 MM5 forecasts. *Wea. Forecasting,* **12**, 719–735.
17. Weisman, M. L. and C. A. Davis, 1998: Mechanisms for the generation of mesoscale vortices within quasi–linear convective systems. *J. Atmos. Sci*. 55, 2603–2622.
18. Davis, C. A. and M. T. Stoelinga, 1999: Interpretation of the effect of mountains on synoptic–scale baroclinic waves. *J.Atmos. Sci.*, **56**, 3303–3320.
19. Davis, C. A. and M. T. Stoelinga, 1999: The transition to topographic normal modes. *J. Atmos. Sci.,* **56**, 3321–3330.
20. Davis, C.A., T. Warner, E. Astling and J. Bowers, 1999: Development and application of an operational, relocatable, mesogamma–scale weather analysis and forecasting system. *Tellus,* special issue on the Rossby–100 Symposium, **51A**, 710–727.
21. Davis, C.A., S. Low–Nam, M.A. Shapiro, X. Zou and A.J. Krueger, 1999: Direct retrieval of wind from total ozone mapping spectrometer (TOMS) data: Examples from FASTEX. *Quart. J. Royal* *Meteor. Soc.*, FASTEX special issue, 3375–3391.
22. Davis, C and F. Carr, 2000: Summary of the 1998 workshop on mesoscale model verification, *Bull. Amer. Meteor. Soc.*, **81**, 809–819.
23. Davis, C.A., S. Low–Nam and C.F. Mass, 2000: Dynamics of a Catalina eddy revealed by numerical simulation. *Mon. Wea. Rev*., **128**, 2885–2904.
24. Zhang, F., S.E. Koch, C.A. Davis, and M.L. Kaplan, 2000: A survey of unbalanced flow diagnostics and their application. Advances in atmospheric sciences. *Adv. Atmos. Phys*., **17**, 165–183.
25. Trier, S.B., C.A. Davis, and J. D. Tuttle, 2000 : Long–lived mesoconvective vortices and their environment. Part I: Observations from the central United States during the 1998 warm season. *Mon. Wea. Rev*, **128**, 3376–3395.
26. Trier, S.B., C.A. Davis, and W. C. Skamarock, 2000 : Long–lived mesoconvective vortices and their environment. Part II: Induced thermodynamic destabilization in idealized simulations. *Mon. Wea. Rev*., **128**, 3396–3414.
27. Davis, C.A. and L.F. Bosart, 2001: Numerical simulations of the genesis of hurricane Diana (1984). *Mon. Wea. Rev*. **129**, 1859–1881.
28. Zhang, F., S.E. Koch, C.A. Davis, M.L. Kaplan, and Y.–L. Lin, 2001: Wavelet analysis and the governing dynamics of a large–amplitude mesoscale gravity wave event along the east coast of the United States. *Quart. J. Roy. Meteor. Soc*., **127**, 2209–2245.
29. Davis, C.A., D.A. Ahijevych and S.B. Trier, 2002: Detection and prediction of warm season, midtropospheric vortices by the rapid update cycle*. Mon. Wea. Rev*., **130**, 24–42.
30. Trier, S. B., and C. A. Davis, Influence of balanced motions on heavy precipitation within a long–lived convectively generated vortex. 2002: *Mon. Wea. Rev*., **130**, 877–899.
31. Powers, J. G., and C. A. Davis, 2002: A Cloud–Resolving, Regional Simulation of Tropical Cyclone Formation. *Atmos. Sci. Lett*., doi.10.1006/asle.2002.0054
32. Davis, C. A., and L. F. Bosart, 2002: Numerical Simulations of the Genesis of Hurricane Diana (1984). Part II: Sensitivity of Track and Intensity Prediction. *Mon. Wea. Rev*., **130**, 1100–1124.
33. Davis, C. A., and S. B. Trier, 2002: Cloud–resolving simulations of mesoscale vortex intensification and its effect on a serial mesoscale convective system. *Mon. Wea. Rev*., **130**, 2839–2858.
34. Jang, K–I, X. Zou, M. S. F. V. De Pondeca, M. Shapiro, C. Davis, and A. J. Krueger, 2003: Incorporating TOMS ozone measurements into the prediction of the Washington, C. D., winter storm during 24–25 January 2000. *J. Appl. Meteor*., **42**, 797–812.
35. Davis, C. A., K. W. Manning, R. E. Carbone, S. B. Trier, and J. D. Tuttle, 2003: Coherence of warm–season continental rainfall in numerical weather prediction models. *Mon. Wea. Rev*., **131**, 2667–2679.
36. Davis, C. A., and L. F. Bosart, 2003: Baroclinically induced tropical cyclogenesis. *Mon. Wea. Rev*., **131**, 2730–2747.
37. Hendricks, E. A., M. T. Montgomery, and C. A. Davis, 2004: On the role of vortical hot towers in hurricane formation. *J. Atmos. Sci*., **61**, 1209–1232.
38. Davis, C., N. Atkins, D. Bartels, L. Bosart, M. Coniglio, G. Bryan, W. Cotton, D. Dowell, B. Jewett, R. Johns, D. Jorgensen, J. Knievel, K. Knupp, W.–C. Lee, G. McFarquhar, J. Moore, R. Przybylinski, R. Rauber, B. Smull, J. Trapp, S. Trier, R. Wakimoto, M. Weisman, and C. Ziegler, 2004: The Bow–Echo And MCV Experiment (BAMEX): Observations and Opportunities, *Bull. Amer. Meteor. Soc.*, **85**, 1075–1093.
39. Done, J., C. Davis, and M. Weisman, 2004: The Next Generation of NWP: Explicit Forecasts of Convection Using Weather Research and Forecast (WRF) Model. *Atmos. Sci. Lett.*, DOI: 10.1002/asl.72.
40. Rife, D. L., T. T. Warner, Y. Liu, and C. A. Davis, 2004: Predictability of low–level winds by mesoscale meteorological models. *Mon. Wea. Rev.,* **132**, 2553–2569.
41. Davis, C. A., and L. F. Bosart, 2004: The TT Problem: Forecasting the Tropical Transition of Cyclones. *Bull Amer. Meteor. Soc.* (Map Room). **85**, 1657–1662.
42. Ahijevych, D. A., C. A. Davis, R. E. Carbone, and J. D. Tuttle, 2004: Initiation of precipitation episodes relative to elevated terrain. *J. Atmos. Sci.*, **61**, 2763–2769.
43. Rife, D. L., and C. A. Davis, 2005: Verification of temporal variations in mesoscale numerical wind forecasts. *Mon. Wea. Rev*., **133**, 3368–3381.
44. Davis, C., B. Brown, and R. Bullock, 2006: Object–based verification of precipitation forecasts, Part I: Methodology and application to mesoscale rain areas. *Mon. Wea. Rev.*, 1782–1784.
45. Davis, C., B. Brown, and R. Bullock, 2006: Object–based verification of precipitation forecasts, Part II: Application to convective rain systems. *Mon. Wea. Rev.*, 1785–1795.
46. Davis, C. A., and L. F. Bosart, 2006: The Formation of Hurricane Humberto (2001): The importance of extra–tropical precursors. *Quart. J. Royal Meteor. Soc.*, **132**, 2055–2085.
47. Tuttle, J., and C. A. Davis, 2006: Corridors of warm–season precipitation in the Central United States. *Mon Wea. Rev*. **134**, 2297–2317.
48. Wakimoto, R. M., H. V. Murphey, C. A. Davis, and N. T. Atkins, 2006: High winds generated by bow echoes. Part II: The relationship between the mesovortices and damaging straight–line winds. *Mon. Wea. Rev*., **134**, 2813–2829.
49. Trier, S. B., C. A. Davis, D. A. Ahijevych, M. L. Weisman, and G. H. Bryan, 2006: Mechanisms Supporting Long–lived Episodes of Propagating Nocturnal Convection within a 7–day WRF Model Simulation. J. Atmos. Sci., **63**, 2437–2461.
50. McTaggert–Cowan, R. L. F. Bosart, C. A. Davis, E. H. Atallah, and J. R. Gyakum, and K. A. Emanuel, 2006: Analysis of Hurricane Catarina (2004). *Mon. Wea. Rev.*, **134**, 3029–3053.
51. Conzemius, R. J., R. W. Moore, M. T. Montgomery, and C. A. Davis, 2007: Mesoscale Convective Vortex Formation in a Weakly Sheared Moist Neutral Environment. *J. Atmos. Sci.,* ***64***, 1443–1466.
52. Hawblitzel, D., F. Zhang, and C. A. Davis, 2007: Probabilistic Evaluation of the Dynamics and Predictability of a Mesoscale Convective Vortex Event of 10–13 June 2003. *Mon. Wea. Rev.*, **135**, 1544–1563.
53. Davis, C. A., and S. B. Trier, 2007: Mesoscale Convective Vortices Observed During BAMEX, Part I: Kinematic and Thermodynamic Structure. *Mon.Wea. Rev.*, **135**, 2029–2049.
54. Trier, S. B., and C. A. Davis, 2007: Mesoscale Convective Vortices Observed During BAMEX, Part II: Influences on Secondary Deep Convection. *Mon.Wea. Rev*., **135**, 2051–2075.
55. McTaggart–Cowan, R., G. D. Deane, L. F. Bosart, C. A. Davis, and T. J. Galarneau, Jr., 2008: Climatology of tropical cyclogenesis in the North Atlantic (1948–2004). *Mon. Wea. Rev*., **136**, 1284–1304.
56. Musgrave, K. D., C. A. Davis, and M. T. Montgomery, 2008: Numerical simulations of the formation of Hurricane Gabrielle (2001). Mon. Wea. Rev., **136**, 3151–3167.
57. Davis, C. A., S. C. Jones, and M. Riemer, 2008: Hurricane vortex dynamics during Atlantic Extratropical Transition. *J. Atmos. Sci.*, **65**, 714–736.
58. Trenberth, K. E., C. A. Davis and J. Fasullo, 2008: The water and energy budgets of hurricanes: Case studies of Ivan and Katrina . *J. Geophys. Res.,* ***112****,* D23106.
59. Davis, C., W. Wang, S. Chen, Y. Chen, K. Corbosiero, M. DeMaria, J. Dudhia, G. Holland, J. Klemp, J. Michalakes, H. Reeves, R. Rotunno, and Q. Xiao, 2008: Prediction of landfalling hurricanes with the advanced hurricane WRF model. *Mon Wea. Rev*., **136**, 1990–2005.
60. Riemer, M., S. C. Jones, and C. A. Davis, 2008: The impact of extratropical transition on the downstream flow: an idealized modelling study with a straight jet. *Quart. J. Royal Meteor. Soc.* **134**, 69–91.
61. Young, L.–H., J. C. Wilson, D. R. Benson, W. M. Montanaro, S.–H Lee, L. L. Pan, D. C. Rogers, J. Jensen, J. Stith, C. A. Davis, T. L. Campos, K. P. Bowman, W. A. Cooper, and L. R. Lait, 2008: Enhanced New Particle Formation Observed in the Northern Midlatitude Tropopause Region. *J. Geophys. Res.,* ***112****,* D10218.
62. Pan, L. L., K. P. Bowman, M. Shapiro, W. J, Randel, R. Gao, T. Campos, C. Davis, S. Schauffler, B. A. Ridley, J. C. Wei, and C. Barnet, 2008: Chemical behavior of the tropopause observed during the Stratosphere–Troposphere Analyses of Regional Transport (START) experiment. *J. Geophys. Res., American Geophysical Union,* ***112****,* D18110.
63. Weisman, M. L., C. A. Davis, W. Wang, and K. Manning, 2008: Experiences with 0–36h Explicit Convective Forecasts with the WRF–ARW Model. *Wea. And Forecasting*, **23**, 407–437.
64. Liu, Y., J. F. Bowers, L. P. Carson, F. Chen, C. A. Clough, C. A. Davis, C. H. Egeland, S. Halvorson, T. W. Huck, Jr., R. E. Malone, D. L. Rife, R.–S. Sheu, S. P. Swerdlin, T. T. Warner, and D. S. Weingarten, 2008: The operational mesogamma–scale analysis and forecast system of the U. S. Army Test and Evaluation Command. Part I: Overview of the modeling system and forecast products. *J. Appl. Meteor. Clim*.,**47**, 1077–1093.
65. Liu, Y., T. T. Warner, E. G. Astling, J. F. Bowers, C. A. Davis, S. Halvorson, D. L. Rife, R.–S. Sheu, S. P. Swerdlin, and M. Xu, 2008: The operational mesogamma–scale analysis and forecast system of the U. S. Army Test and Evaluation Command. Part II: Inter–range comparison of the accuracy of model analyses and forecasts. *J. Appl. Meteor. Clim*. **47**, 1093–1104.
66. Davis, C. A., C. S. Snyder, and A. C. Didlake, Jr., 2008: A vortex–based perspective of eastern Pacific tropical cyclone formation. *Mon. Wea. Rev.*, **136**, 2461–2477.
67. Trier, S. B., F. Chen, K. W. Manning, M. A. LeMone, and C. A. Davis, 2008: Sensitivity of the simulated PBL and precipitation to land–surface conditions during a 12–day warm–season convection period in the central United States. *Mon. Wea. Rev.*, **136**, 2321–2343.
68. Davis, C. A., and T. J. Galarnearu, Jr., 2009: The vertical structure of mesoscale convective vortices. *J. Atmos. Sci.,* **66**, 686–704.
69. Galarneau, T. J. Jr., L. F. Bosart, C. A. Davis, and R. McTaggart–Cowan, 2009: Baroclinic transition of a long–lived mesoscale convective vortex. *Mon .Wea. Rev.,* **137**, 562–584.
70. Rotunno, R., Y. Chen, W. Wang, C. Davis, J. Dudhia, and G. J. Holland, 2009: Resolved turbulence in a three–dimensional model of an idealized tropical cyclone. *Bull. Amer. Meteor. Soc.,* **90**, 1783–1788.
71. Rife, D., J. Knievel, and C. A. Davis, 2009: Temporal changes in wind as objects for evaluating numerical weather prediction. *Wea. Forecasting,* **24**, 1373–1389.
72. Xiao, Q., Zhang, X., C. Davis, J. Tuttle, G. Holland, and P. J. Fitzpatrick, 2009: Experiments of hurricane initialization with airborne Doppler radar data for the Advanced Hurricane–research WRF (AHW) model., *Mon. Wea. Rev.*, **137,** 2758–2777.
73. **Davis, C. A.,** B. G. Brown, R. Bullock, and J. Halley–Gotway, 2009: The method for object–based diagnostic evaluation (MODE) applied to WRF forecasts from the 2005 SPC spring program. *Wea. Forecasting*, **24**, 1252–1267.
74. Trier, S.B., **Davis, C.A.**, Ahijevych, D. 2010: Environmental controls on the simulated diurnal cycle of warm–season precipitation in the Continental United States. J. Atmos. Sci., 67, 1066–1090, 10.1175/2009JAS3247.1.
75. **Davis, C. A.,** 2010: Simulations of subtropical cyclones in a baroclinic channel model. *J. Atmos. Sci*. **67**, 2871–2892.
76. Rife, D. L., J. O. Pinto, A. J. Monaghan, **C. A. Davis**, and J. R. Hannan, 2010: Global distribution and characteristics of diurnally–varying low–level jets. *J. Climate*. **23,** 5041–5064.
77. Monaghan, A. J., D. L. Rife, J. O. Pinto, **C. A. Davis**, and J. R. Hannan, 2010: Global precipitation extremes associated with diurnally–varying LLJs. *J. Climate*. **23**, 5065–5084.
78. Schumacher, R. S., **C. A. Davis**, 2010: Ensemble–Based forecast uncertainty analysis of diverse heavy rainfall events. *Wea. Forecasting*, **25**, 1103–1122.
79. Lai, H.–W., **C. A. Davis**, and B. J.–D. Jou, 2011: A subtropical mesoscale convective vortex observed during SoWMEX/TiMREX. *Mon. Wea. Rev*., 2367–2385.
80. **Davis, C.,** W. Wang, S. Cavallo, J. Done, J. Dudhia, S. Fredrick, J. Michalakes, G. Caldwell, T. Engel, and R. Torn, 2010: High–resolution Hurricane Forecasts. *Comput. Sci. Eng.* **13**, 22.
81. **Davis, C. A.,** W. Wang, J. Dudhia, and R. Torn: 2010: Does Increased Horizontal Resolution Improve Hurricane Wind Forecasts? *Wea. Forecasting*. **25**, 1826–1841.
82. Trier, S. B., J. H. Marsham, **C. A. Davis**, and D. A. Ahijevych, 2011: Numerical simulations of the post–sunrise reorganization of a nocturnal mesoscale convective system during 13 June IHOP\_2002. *J. Atmos. Sci.* 68, 2988–3011.
83. Montgomery, M. T., **C. Davis**, T. Dunkerton,1, Z. Wang, C. Velden, R. Torn, S. Majumdar, F.Zhang , R. K. Smith, L. Bosart, M. M. Bell, J. S. Haase, A. Heymsfield, J.Jensen, T. Campos and M. A. Boothe, 2011: The Pre–Depression Investigation of Cloud Systems in the Tropics (PREDICT) Experiment: Scientific Basis, New Analysis Tools and Some First Results. *Bull. Amer. Meteorol. Soc*., *93*, 153–172.
84. **Davis, C. A**., and W.–C. Lee, 2012: Mesoscale Analysis of Heavy Rainfall Episodes from SoWMEX/TiMREX. *J. Atmos. Sci.,* **69**, 521–537.
85. Krishnamurti, T. N., A. Simon, M. Kanti Biswas, and **C. Davis**, 2012: Impacts of Cloud Flare–ups on Hurricane Intensity resulting from Departures from Balance Laws. *Tellus.* 64, 18399, http://dx.doi.org/10.3402/tellusa.v64i0.18399
86. **Davis, C. A.,** and D. A. Ahijevych, 2012: Mesoscale Structural Evolution of Three Tropical Weather Systems Observed during PREDICT. *J. Atmos. Sci.,* **69**, 1284–1305.
87. Torn, R. L., and **C. A. Davis**, 2012: The influence of shallow convection on tropical cyclone track forecasts. *Mon. Wea. Rev*. **140**, 2188–2197.
88. Laing, A. G., S. B. Trier, and **C. A. Davis,** 2012: Numerical Simulation of Episodes of Organized Convection in Tropical Northern Africa. *Mon. Wea. Rev*., **140**, 2874–2886.
89. Rife, D. L., E. Vanvyve, J. O. Pinto, A. J. Monaghan, **C. A. Davis**, and G. S. Poulos, 2012: Selecting representative days for more efficient dynamical climate downscaling: Application to wind energy. *J. Appl. Meteor. Clim*., **52**, 47–63.
90. Cavallo, S. M., R. D. Torn, C. Snyder, **C. Davis**, W. Wang and J. Done, 2012: Evaluation of the Advanced Hurricane WRF data assimilation system for the 2009 Atlantic hurricane season. *Mon. Wea. Rev*., **141**, 523–541.
91. Galarneau, T. J., Jr., and **C. A. Davis**, 2013: Diagnosing forecast errors in tropical cyclone motion. *Mon. Wea. Rev.,* **141**, 405–430.
92. **Davis, C. A**., and D. A. Ahijevych, 2013: Thermodynamic Environments of Deep Convection in Atlantic Tropical Disturbances. *J. Atmos. Sci.,* **70**, 1912–1928.
93. Tuttle, J. D., and **C. A. Davis**, 2013: Modulation of the Diurnal Cycle of Warm–Season Precipitation by Short–Wave Troughs. *J. Atmos. Sci.*, **70**, 1710–1726.
94. **Davis, C. A**., S. C. Jones, D. Anwender, L. Scheck, and J. Badey, 2013: Mesoscale cyclogenesis over the western North Pacific Ocean during TPARC. *Tellus A*, **65**, 18621, <http://dx.doi.org/10.3402/tellusa.v65i0.18621>.
95. Grams, C. M., Jones, S. C., **Davis, C. A**., Harr, P. A. and Weissmann, M. (2013), The impact of Typhoon Jangmi (2008) on the midlatitude flow. Part I: Upper–level ridgebuilding and modification of the jet. Q.J.R. Meteorol. Soc., 139: 2148–2164. doi: 10.1002/qj.2091
96. Grams, C. M., Jones, S. C. and **Davis, C. A**. (2013), The impact of Typhoon Jangmi (2008) on the midlatitude flow. Part II: Downstream evolution. Q.J.R. Meteorol. Soc., 139: 2165–2180. doi: 10.1002/qj.2119
97. Galarneau, T. J., Jr., **C. A. Davis**, and M. A. Shapiro, 2013: Hurricane Sandy (2012): Vortex intensification during warm core seclusion. *Mon. Wea. Rev.*, **141**, 4296–4321.
98. Trier, S. B., **C. A. Davis**, D. A. Ahijevych, and K. W. Manning, 2014: Use of the parcel buoyancy minimum (Bmin) to diagnose simulated thermodynamic destabilization. Part I: Methodology and Case Studies of MCS Initiation Environments. *Mon. Wea. Rev*., doi: http://dx.doi.org/10.1175/MWR–D–13–00272.1
99. Trier, S. B., **C. A. Davis**, D. A. Ahijevych, and K. W. Manning, 2014: Use of the parcel buoyancy minimum (Bmin) to diagnose simulated thermodynamic destabilization. Part II: Composite Analysis of Mature MCS Environments. *Mon. Wea. Rev*., doi: http://dx.doi.org/10.1175/MWR–D–13–00273.1
100. **Davis, C. A**., D. A. Ahijevych, J. A. Haggerty, and M. J. Mahoney, 2014: Observations of Temperature in the Upper Troposphere and Lower Stratosphere of Tropical Weather Disturbances. *J. Atmos. Sci.*, **70**, 1593–1608.
101. Trier, S., B., **C. A. Davis**, and R. E. Carbone, 2014: Mechanisms governing the persistence and diurnal cycle of a heavy rainfall corridor. *J. Atmos. Sci*., **71**, 4102–4126. doi: <http://dx.doi.org/10.1175/JAS–D–14–0134.1>
102. Galarneau, T. J., Jr., R. McTaggart–Cowan, L. F. Bosart, and **C. A. Davis**, 2015: Development of North Atlantic tropical disturbances near upper level potential vorticity streamers. *J. Atmos. Sci*., **72**, 572–597.
103. Archambault, H. M., D. Keyser, L. F. Bosart, **C. A. Davis**, and J. M. Cordeira, 2015: A composite perspective of the extratropical flow response to recurving western North Pacific tropical cyclones. *Mon. Wea. Rev*., **143**, 1122-1141. http://dx.doi.org/10.1175/MWR–D–14–00270.1
104. Weisman, M. L., R. J. Trapp, G. S. Romine, **C. Davis**, R. Torn, M. Baldwin, L. Bosart, J. Brown, M.Coniglio, D. Dowell, A. C. Evans, T. J. Galarneau, Jr., J. Haggerty, T. Hock, K. Manning, P. Roebber, P. Romashkin, R. Schumacher, C. S. Schwartz, R. Sobash, D. Stensrud, S. B. Trier, 2015: The Mesoscale Predictability Experiment (MPEX), *Bull. Amer. Meteor. Soc*., <http://dx.doi.org/10.1175/BAMS–D–13–00281.1>
105. Chen, S.-H., Y.-C. Liu, T. R. Nathan, **C. Davis**, R. Torn, N. Sow, C.-T. Cheng, and J.-P. Chen, 2015: Modeling the effects of dust-radiative forcing on the movement of Hurricane Helene (2006). *Quart. J. Royal. Meteor. Soc.,* **141**, 2563-2570.
106. **Davis, C. A**., 2015: The formation of moist vortices and tropical cyclones in idealized simulations, *J. Atmos. Sci*., **72**, 3499–3516.
107. Rios-Berrios, R., R. D. Torn and **C. A. Davis**, 2016: An Ensemble Approach to Investigate Tropical Cyclone Intensification in Sheared Environments. Part I: Katia (2011). *J. Atmos. Sci.*, **73**, 71-93.
108. **Davis, C. A**., D. A. Ahijevych, W, Wang and W. C, Skamarock, 2016: Evaluating Medium-Range Tropical Cyclone Forecasts in Uniform and Variable-Resolution Global Models. *Mon. Wea. Rev*., In Press.
109. Rios-Berrios, R., R. D. Torn, and **C. A. Davis**, 2016: An Ensemble Approach to Investigate Tropical Cyclone Intensification in Sheared Environments. Part II: Ophelia (2011). Mon . Wea. Rev., **73**, 1555–1575.
110. Chen, D., Z. Liu, **C. Davis**, and Yu Gu, 2016: Dust Radiative Effects on Atmospheric Thermodynamics and Tropical Cyclogenesis over the Atlantic Ocean Using WRF/Chem Coupled with an AOD Data Assimilation System. *Atmos. Chem. Phys*., 17, 7917-7939. https://doi.org/10.5194/acp-17-7917-2017
111. Jordan G. Powers; Joseph B. Klemp; William C. Skamarock; **Christopher A. Davis**; Jimy Dudhia; David O. Gill; Janice L. Coen; David J. Gochis; Ravan Ahmadov; Steven E. Peckham; Georg A. Grell; John Michalakes; Samuel Trahan; Stanley G. Benjamin; Curtis R. Alexander; Geoffrey J. DiMego; Wei Wang; Craig S. Schwartz; Glen S. Romine; Zhiquan Liu; Chris Snyder; Fei Chen; Michael J. Barlage; Wei Yu; Michael G. Duda, 2017: The Weather Research and Forecasting (WRF) Model: Overview, System Efforts, and Future Directions. Bull Amer. Meteor. Soc. 98, 1717–1737, https://doi.org/10.1175/BAMS-D-15-00308.1
112. Rebecca E Morss; Julie L Demuth; Heather Lazrus; Leysia Palen; C Michael Barton; **C. A Davis**; Chris Snyder; Olga V Wilhelmi; Kenneth M Anderson; David A Ahijevych; Jennings Anderson; Melissa Bica; Kathryn R Fossell; Jennifer Henderson; Marina Kogan; Kevin Stowe; Joshua Watts, 2017: Hazardous Weather Prediction and Communication in the Modern Information Environment. *Bull. Amer. Meteor. Soc*., **98**, 2653–2674, <https://doi.org/10.1175/BAMS-D-16-0058.1>
113. Evans, C., K. Wood, S. D. Aberson, H. M. Archambault, S. M. Milrad, L. F. Bosart; K. L. Corbosiero, **C. A. Davis**, J. R D. Pinto, J. Doyle, C. Fogarty, T. J. Galarneau, Jr., C. M. Grams, K. S. Griffin, J. Gyakum, R. E. Hart, N. Kitabatake, H. S., Lentink, R. McTaggart-Cowan, W. Perrie, J. F. D. Quinting; C. A. Reynolds, M. Riemer, E. Ritchie, Y. Sun, and F. Zhang., 2017: The Extratropical Transition of Tropical Cyclones. Part I: Cyclone Evolution and Direct Impacts. *Mon. Wea. Rev*., **145**, 4317–4344, https://doi.org/10.1175
114. Fossell, K. R., D. Ahijevych, R. E. Morss, C. Snyder, and **C. Davis**, 2017: The Practical Predictability of Storm Surge. *Mon. Wea. Rev*., **145**, 5103–5121, https://doi.org/10.1175/MWR-D-17-0051.1
115. Wang, Z., W. Li; M. Peng, X. Jiang, R. McTaggart-Cowan, and **C. Davis**, 2017: Predictive Skill and Predictability of North Atlantic Tropical Cyclogenesis in Different Synoptic Flow Regimes. *J. Atmos. Sci.*, **75**, 361–378, <https://doi.org/10.1175/JAS-D-17-0094.1>
116. Zhang, Y., F. Zhang, C.A. Davis, and J. Sun, 2018: Diurnal evolution and structure of long-lived mesoscale convective vortices along the Mei-yu front over the East China Plains. J. Atmos. Sci., <https://doi.org/10.1175/JAS-D-17-0197.1>
117. Chen, B.-F., C. A. Davis. and Y.-H. Kuo, 2018: Effects of low-level flow orientation and vertical shear on the structure and intensity of tropical cyclones. Mon. Wea. Rev., Accepted
118. Davis, C. A., 2018: Resolving tropical cyclone intensity in models. *Geophys. Res. Lett*., 45, 2082–2087. <https://doi.org/10.1002/2017GL076966>
119. Rios-Berrios, R., C. A. Davis, and R. D. Torn, 2018: A hypothesis for the intensification of tropical cyclones under moderate vertical wind shear. Mon. Wea. Rev. *J. Atmos. Sci.,* **75**, 4149–4173, <https://doi.org/10.1175/JAS-D-18-0070.1>
120. Chen, B., C.A. Davis, and Y. Kuo, 2018: Effects of Low-Level Flow Orientation and Vertical Shear on the Structure and Intensity of Tropical Cyclones. *Mon. Wea. Rev.,* **146**, 2447–2467, <https://doi.org/10.1175/MWR-D-17-0379.1>
121. Torn, R.D., T.J. Elless, P.P. Papin, and C.A. Davis, 2018: [Tropical Cyclone Track Sensitivity in Deformation Steering Flow.](https://journals.ametsoc.org/doi/abs/10.1175/MWR-D-18-0153.1) *Mon. Wea. Rev.,* **146**, 3183–3201, <https://doi.org/10.1175/MWR-D-18-0153.1>
122. Wang, Y., C.A. Davis, and Y. Huang, 2019: Dynamics of Lower-Tropospheric Vorticity in Idealized Simulations of Tropical Cyclone Formation. *J. Atmos. Sci.,* **76**, 707–727, <https://doi.org/10.1175/JAS-D-18-0219.1>
123. Chen, B., C.A. Davis, and Y. Kuo, 2019: An Idealized Numerical Study of Shear-Relative Low-Level Mean Flow on Tropical Cyclone Intensity and Size. *J. Atmos. Sci.,* **76**, 2309–2334, <https://doi.org/10.1175/JAS-D-18-0315.1>
124. Ito, Kosuke, C-C Wu, K. T. F. Chan, R Toumi, C. Davis, 2020: Recent Progress in the Fundamental Understanding of Tropical Cyclone Motion, Journal of the Meteorological Society of Japan. .https://doi.org/10.2151/jmsj.2020-001.
125. Wang, C.-C., K-Y Lin, C. Davis, S.-Y. Huang, S. Liu, K Tsuboki, and B. Jou, 2020: A Modeling Study on the Impacts of Typhoon Morakot (2009)’s Vortex Structure on Rainfall in Taiwan through the Use of Piecewise Potential Vorticity Inversion. *J. Meteorol. Soc. Jpn*., Accepted.
126. Chen, X., R. G. Nystrom; C. A. Davis and C. Zarzycki, 2020: Dynamical Structures of Cross-Domain Forecast Error Covariance of Tropical Cyclone in a Convection-Permitting Coupled Atmosphere-Ocean Model. *Mon. Wea. Rev*., Submitted.
127. Nystrom, R. G., R. Rotunno, C. A. Davis and F. Zhang, 2020: Consistent impacts of surface enthalpy and drag coefficient uncertainty between an analytical model and simulated tropical cyclone maximum intensity and storm structure. *J. Atmos. Sci.,* Conditionally Accepted.
128. Nystrom, R. G., Chen, X., Zhang, F., and Davis, C. A. (2020). Nonlinear impacts of surface exchange coefficient uncertainty on tropical cyclone intensity and air‐sea interactions. *Geophysical Research Letters*, **47**, e2019GL085783. <https://doi.org/10.1029/2019GL085783>
129. Ito, K., C.-C. Wu, K. T. F. Chan, R. Toumi, and C. Davis, 2020: Recent progress in fundamental understanding of tropical cyclone motion. *J. Meteorol. Soc. Jpn*. https://doi.org/10.2151/jmsj.2020-001.
130. Ralph, F. M., et al., 2020: West Coast Forecast Challenges and Development of Atmospheric River Reconnaissance, *Bull. Amer. Meteor. Soc*., Accepted.

**Other Externally Refereed Publications [Book Chapters**]

Davis, C.A., 1996: Potential Vorticity. *The Encyclopedia of Weather and Climate*. S. Schneider, Ed., 602–608.

Davis, C. A., and J. C.-L. Chan, 2015: Tropical Cyclone intensification: Prediction and mechanisms. Chapter 8 in *World Weather Open Science Conference*.

Conference Presentations (First author only, 2015-2018)

1. August, 2015: The Aggregation of Convection and Tropical Cyclone Formation, AMS Mesoscale Conf., Boston, MA
2. December, 2015: Variable-Resolution Tropical Cyclone Prediction Using the Model for Prediction Across Scales (MPAS), AGU, San Francisco, CA
3. December, 2016: On the Origin of Large Tropical-Cyclone-Track Errors, AGU, San Francisco, CA
4. January, 2017: Quasi-geostrophy, Moist Convection and Tropical Transition, AMS Bosart Symposium, Seattle, WA (invited)
5. October, 2017: An overlooked Aspect of Mesoscale Convective Vortices, ICMCS-XII, Taipei, Taiwan (invited)
6. December, 2017: Tropical Cyclone Intensity in Global Models. AGU, New Orleans, LA (invited).
7. January, 2018: An overlooked Aspect of Mesoscale Convective Vortices, AMS Raymond Symposium, Austin, TX (invited).
8. May 2018: The Practical Predictability of Storm Tide from Tropical Cyclones, 2018 APEC Typhoon Symposium, Taipei, Taiwan (invited)

Invited Seminars and Lectures (2014-2017)

June, 2014: Diagnosing the Prediction of Tropical Cyclones and their Environments in Global Models (GFS and MPAS). National Centers for Environmental Prediction, Environmental Modeling Center, Greenbelt, MD

October, 2014: Tropical Cyclone Formation: The Intersection of Thermodynamics and Vortex Dynamics. CSU Lecture

February, 2015: Hurricanes from Scratch: Colorado State University

April, 2015: Hurricanes from Scratch: MMM Seminar

October, 2015: Global, Variable-Resolution Tropical Cyclone Forecasts using the Model for Prediction Across Scales (MPAS-A), University of Utah

October, 2016: Tropical Cyclone Prediction Using the Model for Prediction Across Scales (MPAS), University of Arizona

April, 2016: Understanding Errors in Numerical Model Predictions of Tropical Cyclone Track, University of Illinois

July, 2017: Evaluating Tropical Cyclone Forecasts in Global Models. University at Albany, SUNY

October, 2017: Mid-latitude Influences on Tropical Cyclones, Colorado State University (lecture)

November, 2017: The Formation of Hurricanes. New Mexico Tech, Socorro, NM

**Funded Grants (PI or Co–PI)**

1994–1996: ONR: Numerical studies of coastal fog

1997–1999: ONR: Coastally trapped disturbances

1998–2000: NASA – USWRP: Mesoscale Convective Vortices

1998–2001: Air Force Weather Agency: MM5 Model development and enhancement

2001–2004: NASA: TOMS Ozone for analysis and data assimilation

2003–2005: NSF: Bow–Echo and MCV Experiment (BAMEX)

2001–2008: USWRP/STEP: Verification of high–resolution numerical forecasts

2002–2006: NSF Water Cycle

2003–2008: USWRP: Episodes of propagating convection

2005–2007: NASA TCSP: Prediction and data assimilation for hurricane genesis

2005–2008: NCAR Opportunity Fund: Doppler radar data assimilation for landfalling hurricanes

2008–2012: NOAA HFIP, Real–time and retrospective hurricane prediction

2009–2012: STEP, Analysis of TiMREX Rainfall: What determines mountain vs. plains rainfall maximum?

2010–2012: NSF, Pre–Depression Investigation of Cloud Systems in the Tropics (PREDICT)

2014: NSF, Graduate Student Support for Attending World Weather Open Science Conference 2014

2014–2015: NOAA, Diagnosing Medium Range Tropical Cyclone Forecast Errors in the GFS Model