

# Casey E. Davenport

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## EDUCATION

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### **Ph.D. in Atmospheric Sciences** (May 2013)

*Dissertation: "Observed and Simulated Supercell Demise Depicted by VORTEX2 Observations"*

Department of Marine, Earth & Atmospheric Sciences  
North Carolina State University  
Raleigh, NC, USA

### **M.S. in Atmospheric Sciences** (August 2009)

*Thesis: "Mesoscale Convective Systems Crossing the Appalachian Mountains"*

Department of Marine, Earth & Atmospheric Sciences  
North Carolina State University  
Raleigh, NC, USA

### **B.S. in Meteorology** (May 2007) *Summa Cum Laude*

Department of Geography and Meteorology  
Valparaiso University  
Valparaiso, IN, USA

## ACADEMIC POSITIONS

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### **Associate Professor** (July 2022 – present)

Department of Geography & Earth Sciences  
University of North Carolina at Charlotte  
Charlotte, NC, USA

### **Assistant Professor** (August 2014 – June 2022)

Department of Geography & Earth Sciences  
University of North Carolina at Charlotte  
Charlotte, NC, USA

### **Assistant Professor** (June 2013 – June 2014), **Lecturer** (June 2012 – May 2013)

Department of Physics  
United States Air Force Academy  
Colorado Springs, CO, USA

**Graduate Research Assistant** (August 2008 – May 2009; August 2010 – May 2012)  
Department of Marine, Earth & Atmospheric Sciences  
North Carolina State University  
Raleigh, NC, USA

**Graduate Teaching Assistant** (August 2007 – May 2008; August 2009 – May 2010)  
Department of Marine, Earth & Atmospheric Sciences  
North Carolina State University  
Raleigh, NC, USA

## RESEARCH

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### Peer-Reviewed Publications (\*denotes student co-author)

1. McKeown, K.E.\*, **C.E. Davenport**, M.D. Eastin, S.M. Purpura\*, and R.R. Riggin\*, 2024: Radar Characteristics of Supercell Thunderstorms Traversing the Appalachian Mountains. *Weather and Forecasting*, **39**, 639 – 654. doi: 10.1175/WAF-D-23-0110.1
2. Purpura, S.M.\*, **C.E. Davenport**, M.D. Eastin, K.E. McKeown\*, and R.R. Riggin\*, 2023: Environmental Evolution of Supercell Thunderstorms Interacting with the Appalachian Mountains. *Weather and Forecasting*, **38**, 179 – 198. doi: 10.1175/WAF-D-22-0115.1
3. Handlos, Z., **C.E. Davenport**, and D. Kopacz, 2022: The “State” of Active Learning in the Atmospheric Sciences: Strategies Instructors Use and Directions for Future Research, *Bulletin of the American Meteorological Society*, E1197 – E1212. doi: 10.1175/BAMS-D-20-0239.1
4. **Davenport, C.E.**, 2021: Environmental Evolution of Long-Lived Supercell Thunderstorms in the Great Plains. *Weather and Forecasting*, **36**, 2187 – 2209. doi: 10.1175/WAF-D-21-0042.1
5. Gropp, M.E.\* and **C.E. Davenport**, 2021: A Python-Based Tracking Algorithm for Coarse Temporal Resolution WRF-Simulated Supercells. *Journal of Atmospheric and Oceanic Technology*, **38**, 1551 – 1559. doi: 10.1175/JTECH-D-20-0122.1
6. **Davenport, C.E.**, and A.J. French, 2020: The Fundamentals in Meteorology Inventory: Validation of a Tool Assessing Basic Meteorological Conceptual Understanding. *Journal of Geoscience Education*, **68**, 152 – 167. doi: 10.1080/10899995.2019.1629193.

7. Magee, K.M.\* and **C.E. Davenport**, 2020: An Observational Analysis Quantifying the Distance of Supercell-Boundary Interactions in the Great Plains. *Journal of Operational Meteorology*, **8**, 15 – 38.
8. **Davenport, C.E.**, C.L. Ziegler, and M.I. Biggerstaff, 2019: Creating a More Realistic Idealized Supercell Thunderstorm Evolution via Incorporation of Base-State Environmental Variability. *Monthly Weather Review*, **147**, 4177 – 4198. doi: 10.1175/MWR-D-18-0447.1
9. **Davenport, C.E.**, 2019: Using Worked Examples to Improve Student Understanding of Atmospheric Dynamics. *Bulletin of the American Meteorological Society*, **100**, 1653 – 1664. doi: 10.1175/BAMS-D-18-0226.1
10. Sherburn, K.D., M.D. Parker, **C.E. Davenport**, R.A. Sirico\*, J.L. Blaes, B. Black, S.E. McLamb, M.C. Murgage, and R.M. Rackliffe, 2019: Partnering Research, Education, and Operations via a Cool Season Severe Weather Soundings Program. *Bulletin of the American Meteorological Society*, **100**, 307 – 320. doi: 10.1175/BAMS-D-17-0186.1
11. Gropp, M.E.\* and **C.E. Davenport**, 2018: The Impact of the Nocturnal Transition on the Lifetime and Evolution of Supercell Thunderstorms in the Great Plains. *Weather and Forecasting*, **33**, 1045 – 1061. doi: 10.1175/WAF-D-17-0150.1
12. **Davenport, C.E.**, 2018: Evolution in Student Perceptions of a Flipped Classroom in a Computer Programming Course. *Journal of College Science Teaching*, **47**, 30 – 35.
13. **Davenport, C.E.** and M.D. Parker, 2015b: Impact of Environmental Heterogeneity on the Dynamics of a Dissipating Supercell Thunderstorm. *Monthly Weather Review*, **143**, 4244 – 4277. doi: 10.1175/MWR-D-15-0072.1.
14. **Davenport, C.E.** and M.D. Parker, 2015a: Observations of the 9 June 2009 Dissipating Supercell from VORTEX2. *Weather and Forecasting*, **30**, 368 – 388. doi: 10.1175/WAF-D-14-00087.1.
15. **Davenport, C.E.**, C.S. Wohlwend, and T.L. Koehler, 2015: Motivation for and Development of a Standardized Introductory Meteorology Assessment Exam. *Bulletin of the American Meteorological Society*, **96**, 305 – 312. doi: 10.1175/BAMS-D-13-00157.1.
16. **Letkewicz, C.E.**, A.J. French, and M.D. Parker, 2013: Base-State Substitution: An Idealized Modeling Technique for Approximating Environmental Variability. *Monthly Weather Review*, **139**, 3062 – 3086. doi: 10.1175/MWR-D-12-00200.1.
17. **Letkewicz, C.E.** and M.D. Parker, 2011: Impact of Environmental Variations on Simulated Squall Lines Interacting with Terrain. *Monthly Weather Review*, **139**, 3163 – 3183. doi: 10.1175/2011MWR3635.1.

18. **Letkewicz, C.E.** and M.D. Parker, 2010: Forecasting the Maintenance of Mesoscale Convective Systems Crossing the Appalachian Mountains. *Weather and Forecasting*, **25**, 1179 – 1195. doi: 10.1175/2010WAF2222379.1.

Professional Conference Presentations and Proceedings (since 2014; \*denotes student co-author)

1. Twohey, L.\* and **C.E. Davenport**, 2024: The Sensitivity of Supercell Thunderstorm Behavior Near Complex Terrain in the Central and Southern Appalachian Mountains. *Southern Appalachian Weather and Climate Workshop*, 1.2, 22-23 March 2024, Radford, VA. Abstracts available at: <https://sites.google.com/view/sawcworkshop/agenda/2024-workshop-agenda?authuser=0>
2. Riffin, R.R.\*, **C.E. Davenport**, M.D. Eastin, S. Purpura\*, K. McKeown\*, and B. Katona, 2024: Idealized Simulations of Supercell Thunderstorms Traversing the Appalachian Mountains. *Southern Appalachian Weather and Climate Workshop*, 1.1, 22-23 March 2024, Radford, VA. Abstracts available at: <https://sites.google.com/view/sawcworkshop/agenda/2024-workshop-agenda?authuser=0>
3. Greco, J.\* and **C.E. Davenport**, 2024: Idealized Simulations of Supercell Thunderstorm Interactions Near Stationary Boundaries. *Southern Appalachian Weather and Climate Workshop*, 22-23 March 2024, Radford, VA. Abstracts available at: <https://sites.google.com/view/sawcworkshop/agenda/2024-workshop-agenda?authuser=0>
4. O'Neill, E.\* and **C.E. Davenport**, 2024: The Sensitivity of the Impact of Cell Mergers on Supercell Thunderstorms Before vs. After Sunset. *Southern Appalachian Weather and Climate Workshop*, 22-23 March 2024, Radford, VA. Abstracts available at: <https://sites.google.com/view/sawcworkshop/agenda/2024-workshop-agenda?authuser=0>
5. Decker, L.E.\* and **C.E. Davenport**, 2024: Characterizing the Growth in Spatial Thinking Abilities in Undergraduate Meteorology Students Across the Curriculum. *33<sup>rd</sup> Conference on Education, 104<sup>th</sup> American Meteorological Society Annual Meeting*, P326, 28 January – 1 February 2024, Baltimore, MD. Abstract available at: <https://ams.confex.com/ams/104ANNUAL/meetingapp.cgi/Paper/439332>
6. **Davenport, C.E.**, Z.J. Handlos, and J.A. Knox, 2024: Collaborative Development of Student-Centered Classroom Activities in Beginner Through Advanced Atmospheric Science Courses. *33<sup>rd</sup> Conference on Education, 104<sup>th</sup> American*

- Meteorological Society Annual Meeting*, 15.2, 28 January – 1 February 2024, Baltimore, MD. Abstract available at:  
<https://ams.confex.com/ams/104ANNUAL/meetingapp.cgi/Paper/438227>
7. Twohey, L.\* and **C.E. Davenport**, 2024: The Sensitivity of Supercell Thunderstorm Behavior Near Complex Terrain in the Central and Southern Appalachians. *23<sup>rd</sup> Student Conference, 104<sup>th</sup> American Meteorological Society Annual Meeting*, American Meteorological Society, S186, 27-28 January 2024, Baltimore, MD. Abstract available at:  
<https://ams.confex.com/ams/104ANNUAL/meetingapp.cgi/Paper/440553>
  8. Greco, J.\* and **C.E. Davenport**, 2024: Idealized Simulations of Supercell Thunderstorm Interactions Near Stationary Boundaries. *23<sup>rd</sup> Student Conference, 104<sup>th</sup> American Meteorological Society Annual Meeting*, American Meteorological Society, S187, 27-28 January 2024, Baltimore, MD. Abstract available at:  
<https://ams.confex.com/ams/104ANNUAL/meetingapp.cgi/Paper/440383>
  9. Riggin, R.R\*, **C.E. Davenport**, M.D. Eastin, K.E. McKeown\*, S.M. Purpura\*, and B.T. Katona, 2023: Characteristics and Evolution of Supercell Thunderstorms in the Central and Southern Appalachian Mountains. *Mid-Atlantic Severe Weather Conference*, 4 November 2023, Richmond, VA.
  10. **Davenport, C.E.**, 2023: The Role of Mesoscale Environmental Variability in Determining Supercell Evolution. *20<sup>th</sup> Conference on Mesoscale Processes*, American Meteorological Society, 17-21 July 2023, Madison, WI. Abstract available at:  
<https://ams.confex.com/ams/WAFNWPMS/meetingapp.cgi/Paper/425043>
  11. Decker, L.E.\*, and **C.E. Davenport**, 2023: Characterizing the Growth in Spatial Thinking Abilities in Meteorology Students Across the Curriculum. *2023 Earth Educators' Rendezvous*, Pasadena, CA, 10-14 July. Abstract available at:  
[https://serc.carleton.edu/earth\\_rendezvous/2023/program/posters/friday/263243.html](https://serc.carleton.edu/earth_rendezvous/2023/program/posters/friday/263243.html)
  12. **Davenport, C.E.**, 2023: Idealized Simulations of Changes in Supercell Morphology Following the Nocturnal Transition. *Southern Appalachian Weather and Climate Workshop*, Asheville, NC, 14-15 April. Abstracts available at:  
<https://sites.google.com/view/sawcworkshop/abstracts>
  13. Greco, J.\*, and **C.E. Davenport**, 2023: Idealized Simulation of Supercell Thunderstorm Interactions Near Stationary Boundaries. *Southern Appalachian Weather and Climate Workshop*, Asheville, NC, 14-15 April. Abstracts available at:  
<https://sites.google.com/view/sawcworkshop/abstracts>
  14. Riggin, R.\*, **C.E. Davenport**, M. Eastin, S. Purpura\*, K. McKeown\*, and B. Katona, 2023: Idealized Supercell Thunderstorms Interacting with the Appalachian Mountains. *Southern Appalachian Weather and Climate Workshop*, Asheville, NC,

- 14-15 April. Abstracts available at:  
<https://sites.google.com/view/sawcworkshop/abstracts>
15. Twohey, L.\*, and **C.E. Davenport**, 2023: Evaluating the Sensitivity of Supercell Thunderstorm Behavior near Complex Terrain in the Central and Southern Appalachians Using Idealized Simulations. *Southern Appalachian Weather and Climate Workshop*, Asheville, NC, 14-15 April. Abstracts available at:  
<https://sites.google.com/view/sawcworkshop/abstracts>
16. Barlow, M., **C.E. Davenport**, W.J. Flynn, Z.J. Handlos, A.M. Klees, and E.D. Mullens, 2023: What Does a Modern Atmospheric Dynamics Course Look Like? Part II: Curricula and Assessments. *32<sup>nd</sup> Conference on Education*, American Meteorological Society Annual Meeting, 6.2, AMS, 8-12 January 2023, Denver, CO. Abstract available at:  
<https://ams.confex.com/ams/103ANNUAL/meetingapp.cgi/Paper/421240>
17. Barlow, M., **C.E. Davenport**, W.J. Flynn, Z.J. Handlos, A.M. Klees, and E.D. Mullens, 2023: What Does a Modern Atmospheric Dynamics Course Look Like? Part I: Course Content. *32<sup>nd</sup> Conference on Education*, American Meteorological Society Annual Meeting, 6.2A, AMS, 8-12 January 2023, Denver, CO. Abstract available at:  
<https://ams.confex.com/ams/103ANNUAL/meetingapp.cgi/Paper/420276>
18. **Davenport, C.E.**, Z.J. Handlos, and J. A. Knox, 2023: Building a Community of Atmospheric Dynamics Educators to Effect Positive Change in Instruction. *32<sup>nd</sup> Conference on Education*, American Meteorological Society Annual Meeting, 15.2, AMS, 8-12 January 2023, Denver, CO. Abstract available at:  
<https://ams.confex.com/ams/103ANNUAL/meetingapp.cgi/Paper/418316>
19. Decker, L.\* and **C.E. Davenport**, 2023: Quantifying Spatial Thinking Abilities in Meteorology Students Across the Curriculum. *32<sup>nd</sup> Conference on Education*, American Meteorological Society Annual Meeting, poster 69, AMS, 8-12 January 2023, Denver, CO. Abstract available at:  
<https://ams.confex.com/ams/103ANNUAL/meetingapp.cgi/Paper/414912>
20. Coffey, B.E., M.D. Parker, and **C.E. Davenport**, 2022: How Quickly Do Supercell Low-Level Mesocyclones Respond to Changes in Their Environment? *30<sup>th</sup> Conference on Severe Local Storms*, poster 64, AMS, 24-28 October 2022, Santa Fe, NM. Abstract available at:  
<https://ams.confex.com/ams/30SLS/meetingapp.cgi/Paper/407119>
21. Riggins, R.R.\*, **C.E. Davenport**, M.D. Eastin, K.E. McKeown\*, S.M. Purpura\*, and B. Katona, 2022: Idealized Simulations of Supercells Thunderstorms Interacting with the Appalachian Mountains. *30<sup>th</sup> Conference on Severe Local Storms*, poster 74, AMS, 24-28 October 2022, Santa Fe, NM. Abstract available at:  
<https://ams.confex.com/ams/30SLS/meetingapp.cgi/Paper/407306>

22. Eastin, M.D., S.M. Purpura\*, K.E. McKeown\*, R.R. Riggin\*, and **C.E. Davenport**, 2022: Synoptic-Mesoscale Conditions Associated with Supercells That Cross the Central and Southern Appalachians. *30th Conference on Severe Local Storms*, poster 73, AMS, 24-28 October 2022, Santa Fe, NM. Abstract available at: <https://ams.confex.com/ams/30SLS/meetingapp.cgi/Paper/407329>
23. Eastin, M.D., K.E. McKeown\*, S.M. Purpura\*, R.R. Riggin\*, and **C.E. Davenport**, 2022: Radar-based Evolution of Supercells crossing Prominent Ridges in the Central and Southern Appalachians. *30th Conference on Severe Local Storms*, poster 72, AMS, 24-28 October 2022, Santa Fe, NM. Abstract available at: <https://ams.confex.com/ams/30SLS/meetingapp.cgi/Paper/407333>
24. Decker, L.\* and **C.E. Davenport**, 2022: Quantifying Spatial Thinking Abilities in Meteorology Students Across the Curriculum. *Earth Educators' Rendezvous*, National Association of Geoscience Teachers, Twin Cities, MN, 11-15 July 2022. Abstract available at: [https://serc.carleton.edu/earth\\_rendezvous/2022/program/posters/friday/249481.html](https://serc.carleton.edu/earth_rendezvous/2022/program/posters/friday/249481.html)
25. Greco, J.\* and **C.E. Davenport**, 2022: Comparing High-Shear, Low-CAPE Supercell Weather Events in the Southeastern United States vs. the Great Plains. *UNC Charlotte Undergraduate Research Conference*, Charlotte, NC.
26. Riggin, R.\*, **C.E. Davenport**, and M.D. Eastin, 2022: A Numerical Study Investigating Idealized Supercell Thunderstorms Interacting with the Appalachian Mountains. *Southern Appalachian Weather and Climate Workshop*, Asheville, NC, 25-26 March. Abstracts available at: <https://vlab.noaa.gov/web/southern-appalachian-weather-and-climate-workshop/poster-presenter-abstracts>
27. **Davenport, C.E.**, 2022: Environmental Evolution of Long-Lived Supercells in the Great Plains. *Southern Appalachian Weather and Climate Workshop*, Asheville, NC, 25-26 March. Abstracts available at: <https://vlab.noaa.gov/web/southern-appalachian-weather-and-climate-workshop/oral-presenter-abstracts>
28. **Davenport, C.E.**, 2022: Environmental Evolution of Long-Lived Supercells in the Great Plains. *19th Conference on Mesoscale Processes, 102nd Annual Meeting of the American Meteorological Society (virtual)*, American Meteorological Society, 23-27 January. Abstract available at: <https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/392731>.
29. **Davenport, C.E.**, 2022: The Benefits and Challenges of Paired Programming in a Meteorological Computer Applications Course. *31st Conference on Education, 102nd Annual Meeting of the American Meteorological Society (virtual)*, American



- Meteorological Society, 23-27 January. Abstract available at:  
<https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/392743>.
30. Barlow, M., **C.E. Davenport**, W.J. Flynn, Z.J. Handlos, A.M. Klees, and E. Mullens, 2022: How Can We Make Teaching Atmospheric Dynamics More Dynamic? *31<sup>st</sup> Conference on Education, 102<sup>nd</sup> Annual Meeting of the American Meteorological Society (virtual)*, American Meteorological Society, 23-27 January. Abstract available at:  
<https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/398880>.
31. Eastin, M.D., K.E. McKeown\*, S.M. Purpura\*, R. Riggin\*, and **C.E. Davenport**, 2022: Radar-Based Evolution of Supercells Crossing Prominent Ridges in the Central and Southern Appalachians. *19<sup>th</sup> Conference on Mesoscale Processes, 102<sup>nd</sup> Annual Meeting of the American Meteorological Society (virtual)*, American Meteorological Society, 23-27 January, Poster 558. Abstract available at:  
<https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/390963>.
32. Eastin, M.D., S.M. Purpura\*, K.E. McKeown\*, R. Riggin\*, and **C.E. Davenport**, 2022: Synoptic-Mesoscale Conditions Associated with Supercells that Cross the Central and Southern Appalachians. *19<sup>th</sup> Conference on Mesoscale Processes, 102<sup>nd</sup> Annual Meeting of the American Meteorological Society (virtual)*, American Meteorological Society, 23-27 January, Poster 559. Abstract available at:  
<https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/390965>.
33. Riggin, R.\*, **C.E. Davenport**, Eastin, M.D., S.M. Purpura\*, and K.E. McKeown\*, 2022: A Numerical Study Investigating Idealized Supercell Thunderstorms Interacting with the Appalachian Mountains. *19<sup>th</sup> Conference on Mesoscale Processes, 102<sup>nd</sup> Annual Meeting of the American Meteorological Society (virtual)*, American Meteorological Society, 23-27 January, Poster 562. Abstract available at: <https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/392794>.
34. Brown, M.C., C.J. Nowotarski, **C.E. Davenport**, J.M. Peters, 2022: Impacts of the Early Evening Transition on Updraft Forcing and Evolution in Idealized Simulations of High-Shear, Low-CAPE Supercells. *19<sup>th</sup> Conference on Mesoscale Processes, 102<sup>nd</sup> Annual Meeting of the American Meteorological Society (virtual)*, American Meteorological Society, 23-27 January, Poster 561. Abstract available at <https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/392600>.
35. Riggin, R.\*, **C.E. Davenport**, and M.D. Eastin, 2021: A Numerical Study Investigating Idealized Supercell Thunderstorms Interacting with the Appalachian Mountains. *Student and Early Career Scientist Virtual Severe Local Storms Conference*, American Meteorological Society, 4-5 November 2021.



36. McKeown, K.\*, **C.E. Davenport**, S. Purpura\*, and M.D. Eastin, 2021: Radar Characteristics of Observed Supercell Thunderstorms Interacting with the Appalachian Mountains. *National Weather Association Annual Meeting*, National Weather Association, Paper 118. Abstract available at: <https://nwas.org/wp-content/uploads/2021/07/NWA-46th-Annual-Meeting-Poster-Presentation-Abstracts-2.pdf>
37. Purpura, S.\*, **C.E. Davenport**, K. McKeown\*, and M.D. Eastin, 2021: Environmental Evolution of Supercells Interacting with the Appalachian Mountains. *A National Weather Association Annual Meeting*, National Weather Association, Paper 136. Abstract available at: <https://nwas.org/wp-content/uploads/2021/07/NWA-46th-Annual-Meeting-Poster-Presentation-Abstracts-2.pdf>
38. Riggin, R.\*, **C.E. Davenport**, and M.D. Eastin, 2021: Idealized Simulations of Supercell Thunderstorms Interacting with the Appalachian Mountains. *National Weather Association Annual Meeting*, National Weather Association, Paper 138. Abstract available at: <https://nwas.org/wp-content/uploads/2021/07/NWA-46th-Annual-Meeting-Poster-Presentation-Abstracts-2.pdf>
39. Hochstatter, L.N.\* and **C.E. Davenport**, 2021: The Temporal Evolution of Tornadoic vs. Non-Tornadoic High Shear Low CAPE Environments. *National Weather Association Annual Meeting*, National Weather Association, Paper 78. Abstract available at: <https://nwas.org/wp-content/uploads/2021/07/NWA-46th-Annual-Meeting-Poster-Presentation-Abstracts-2.pdf>
40. Handlos, Z., **C.E. Davenport**, and D. Kopacz, 2021: The State of Active Learning in the Atmospheric Sciences: Strategies Instructors Use and Directions for Future Research. *Earth Educators' Rendezvous 2021 (virtual)*, National Association of Geoscience Teachers. Abstract available at: [https://serc.carleton.edu/earth\\_rendezvous/2021/program/talks/session6/242648.html](https://serc.carleton.edu/earth_rendezvous/2021/program/talks/session6/242648.html).
41. **Davenport, C.E.**, 2021: Incorporating Pair Programming in a Meteorological Computer Applications Course. *Earth Educators' Rendezvous 2021 (virtual)*, National Association of Geoscience Teachers. Abstract available at: [https://serc.carleton.edu/earth\\_rendezvous/2021/program/posters/wednesday/session1/242737.html](https://serc.carleton.edu/earth_rendezvous/2021/program/posters/wednesday/session1/242737.html).
42. Decker, L.\* and **C.E. Davenport**, 2021: Case Study of the EF-4 Tornado Produced in the 2 March 2012 Tornado Outbreak. *UNC Charlotte Undergraduate Research Conference*, Charlotte, NC.

43. Hochstatter, L.\* and **C.E. Davenport**, 2021: The Temporal Evolution of Tornadic vs. Non-tornadic HSLC Environments. *20<sup>th</sup> Annual Student Conference, 101<sup>st</sup> American Meteorological Society Annual Meeting*, American Meteorological Society, Paper #111. Abstract available at: <https://ams.confex.com/ams/101ANNUAL/meetingapp.cgi/Paper/385213>.
44. McKeown, K.E.\* , **C.E. Davenport**, S.M. Purpura\*, and M.D. Eastin, 2021: Radar Characteristics of Observed Supercell Thunderstorms Interacting with the Appalachian Mountains. *20<sup>th</sup> Annual Student Conference, 101<sup>st</sup> American Meteorological Society Annual Meeting*, American Meteorological Society, Paper #109. Abstract available at: <https://ams.confex.com/ams/101ANNUAL/meetingapp.cgi/Paper/385001>.
45. Purpura, S.M.\* , **C.E. Davenport**, K.E. McKeown\*, and M.D. Eastin, 2021: Environmental Evolution of Supercells Interacting with the Appalachian Mountains. *20<sup>th</sup> Annual Student Conference, 101<sup>st</sup> American Meteorological Society Annual Meeting*, American Meteorological Society, Paper #110. Abstract available at: <https://ams.confex.com/ams/101ANNUAL/meetingapp.cgi/Paper/385061>.
46. Handlos, Z., **C.E. Davenport**, and D. Kopacz, 2021: The “State” of Active Learning Implementation in the Atmospheric Sciences: What Strategies Do Instructors Use and What Can We Do to Improve?” *30<sup>th</sup> Conference on Education, 101<sup>st</sup> American Meteorological Society Annual Meeting (Virtual)*, American Meteorological Society, Paper 13.6. Abstract available at: <https://ams.confex.com/ams/101ANNUAL/meetingapp.cgi/Paper/382056>.
47. **Davenport, C.E.** and M. Gropp\*, 2020: “Comparing Idealized Simulations of Supercell Thunderstorms in Current vs. “Business as Usual” Future Environments. *American Geophysical Union Fall Meeting (Virtual)*, American Geophysical Union, Paper A160-03. Abstract available at: <https://agu.confex.com/agu/fm20/meetingapp.cgi/Paper/661446>.
48. Hochstatter, L.\* and **C.E. Davenport**, 2020: The Temporal Evolution of Severe vs. Non-Severe High Shear Low CAPE Environments. *American Geophysical Union Fall Meeting (Virtual)*, American Geophysical Union, Paper A121-0008. Abstract available at: <https://agu.confex.com/agu/fm20/meetingapp.cgi/Paper/684653>.
49. McKeown, K.\* , **C.E. Davenport**, S. Purpura\*, and M.D. Eastin, 2020: Radar Characteristics of Observed Supercell Thunderstorms Interacting with the Appalachian Mountains. *American Geophysical Union Fall Meeting (Virtual)*, American Geophysical Union, Paper A122-0008. Abstract available at: <https://agu.confex.com/agu/fm20/meetingapp.cgi/Paper/696847>.

50. Purpura, S.\*, **C.E. Davenport**, K. McKeown\*, and M.D. Eastin, 2020: Environmental Evolution of Supercells Interacting with the Appalachian Mountains. *American Geophysical Union Fall Meeting (Virtual)*, American Geophysical Union, Paper A122-0009. Abstract available at: <https://agu.confex.com/agu/fm20/meetingapp.cgi/Paper/697825>.
51. McKeown, K.E.\*, **C.E. Davenport**, S.M. Purpura\*, and M.D. Eastin, 2020: Radar Characteristics of Observed Supercell Thunderstorms Interacting with the Appalachian Mountains. *Midwest Student Conference on Atmospheric Research (Virtual)*, University of Illinois Urbana-Champaign Department of Atmospheric Sciences. Program booklet available at [https://atmos.illinois.edu/system/files/2020-09/FULL\\_PROGRAM\\_MSCAR2020\\_6.pdf](https://atmos.illinois.edu/system/files/2020-09/FULL_PROGRAM_MSCAR2020_6.pdf).
52. Purpura, S.M.\*, **C.E. Davenport**, K.E. McKeown\*, and M.D. Eastin, 2020: Environmental Evolution of Supercells Interacting with the Appalachian Mountains. *Midwest Student Conference on Atmospheric Research (Virtual)*, University of Illinois Urbana-Champaign Department of Atmospheric Sciences. Program booklet available at [https://atmos.illinois.edu/system/files/2020-09/FULL\\_PROGRAM\\_MSCAR2020\\_6.pdf](https://atmos.illinois.edu/system/files/2020-09/FULL_PROGRAM_MSCAR2020_6.pdf).
53. **Davenport, C.E.**, Z.J. Handlos, and D. Kopacz, 2020: Characterizing Instructional Strategies within Atmospheric Science Courses. *Annual Meeting of the North Carolina Academy of Sciences*. Presentation fully prepared but not presented due to COVID-related issues.
54. Handlos, Z., **C.E. Davenport**, and D. Kopacz, 2020: Characterizing Instructional Strategies within Atmospheric Science Courses. *29<sup>th</sup> Conference on Education, 100<sup>th</sup> American Meteorological Society Annual Meeting*, Boston, MA, American Meteorological Society, Paper 2.5. Extended abstract available at <https://ams.confex.com/ams/2020Annual/meetingapp.cgi/Paper/366986>.
55. Gropp, M.\* and **C.E. Davenport**, 2020: The Impacts of “Business as Usual” Climate Change on Supercell Thunderstorms. *Severe Local Storms Symposium, 100<sup>th</sup> American Meteorological Society Annual Meeting*, Boston, MA, American Meteorological Society, Paper 2.6. Extended abstract available at <https://ams.confex.com/ams/2020Annual/meetingapp.cgi/Paper/367204>.
56. Ising, J.\* and **C.E. Davenport**, 2019: Terrain Influence on Supercell Thunderstorms within the Appalachian Mountains. *UNC Charlotte Undergraduate Research Conference*, Charlotte, NC.
57. Gropp, M.E.\* and **C.E. Davenport**, 2019: Storm-Scale Impacts of “Business as Usual” Climate Change on Supercell Thunderstorms. *Earth System Observations*

- and Modeling Graduate Symposium*, Fairfax, VA, Center for Ocean-Land-Atmosphere Studies, George Mason University.
58. **Davenport, C.E.**, 2019: Engaging Students with Theory and Real-World Data to Enhance Learning through Worked Examples. *28<sup>th</sup> Symposium on Education, 99<sup>th</sup> American Meteorological Society Annual Meeting*, Phoenix, AZ, American Meteorological Society, Paper 1.6. Extended abstract available at <https://ams.confex.com/ams/2019Annual/meetingapp.cgi/Paper/350918>.
59. **Davenport, C.E.**, 2018: Environmental Evolution of Long-Lived Supercells. *29<sup>th</sup> Conference on Severe Local Storms*, Stowe, VT, American Meteorological Society, Paper 8.2. Extended abstract available at <https://ams.confex.com/ams/29SLS/meetingapp.cgi/Paper/348358>.
60. Gropp, M.E.\* and **C.E. Davenport**, 2018: A Python-Based Tracking Algorithm for Coarse Temporal Resolution WRF-Simulated Supercells. *29<sup>th</sup> Conference on Severe Local Storms*, Stowe, VT, American Meteorological Society, Paper 130. Extended abstract available at <https://ams.confex.com/ams/29SLS/meetingapp.cgi/Paper/348476>.
61. Mansfield, A.D.\* and **C.E. Davenport**, 2018: The Temporal Evolution of Tornadic and Non-Tornadic VORTEX2 Environments. *29<sup>th</sup> Conference on Severe Local Storms*, Stowe, VT, American Meteorological Society, Paper 59. Extended abstract available at <https://ams.confex.com/ams/29SLS/meetingapp.cgi/Paper/348605>.
62. Sirico, R.A.\* and **C.E. Davenport**, 2018: Assessing Spatial and Temporal Changes in the Environment on the Evolution of Convection in a High Shear, Low Instability Event in North Carolina. *UNC Charlotte Undergraduate Research Conference*, Charlotte, NC.
63. **Davenport, C.E.**, 2018: Using Worked Examples in an Upper-Level Meteorology Class to Enhance Student Learning. *114<sup>th</sup> Annual Meeting of the North Carolina Academy of Science*, Raleigh, NC, North Carolina Academy of Science. Meeting website: <https://www.waketech.edu/about-wake-tech/divisions/mathematics-sciences-engineering/ncas>.
64. **Davenport, C.E.** and A.J. French, 2018: The Fundamentals in Meteorology Inventory: Results from the Development of a New Meteorology Education Tool. *27<sup>th</sup> Symposium on Education, 98<sup>th</sup> American Meteorological Society Annual Meeting*, Austin, TX, American Meteorological Society, Paper 5.5. Extended abstract available at <https://ams.confex.com/ams/98Annual/webprogram/Paper328680.html>.

65. **Davenport, C.E.**, 2018: Using Worked Examples to Teach Atmospheric Dynamics. *27<sup>th</sup> Symposium on Education, 98<sup>th</sup> American Meteorological Society Annual Meeting*, Austin, TX, American Meteorological Society, Paper 8.8. Extended abstract available at <https://ams.confex.com/ams/98Annual/webprogram/Paper328667.html>.
66. **Davenport, C.E.**, M.I. Biggerstaff, and C.L. Ziegler, 2017: Qualitative and Quantitative Comparisons of a Base-State Substitution Simulation with Dual-Doppler Observations of the 29 May 2012 Kingfisher Supercell. *17<sup>th</sup> Conference on Mesoscale Processes*, San Diego, CA, American Meteorological Society, Paper 10.1. Extended abstract available at <https://ams.confex.com/ams/17MESO/webprogram/Paper319728.html>.
67. Gropp, M.\* and **C.E. Davenport**, 2017: Assessing the Impact of the Evening Transition on the Evolution and Lifetime of Supercell Thunderstorms in the Great Plains. *17<sup>th</sup> Conference on Mesoscale Processes*, San Diego, CA, American Meteorological Society, Paper 46. Extended abstract available at <https://ams.confex.com/ams/17MESO/webprogram/Paper319916.html>.
68. Ledbetter, C.J.\* and **C.E. Davenport**, 2017: Analyzing Supercell Intensity Changes in a Heterogeneous Environment in the VORTEX2 Supercell Pair in Southeastern Colorado on 11 June 2009. *17<sup>th</sup> Conference on Mesoscale Processes*, San Diego, CA, American Meteorological Society, Paper 45. Extended abstract available at <https://ams.confex.com/ams/17MESO/webprogram/Paper319804.html>.
69. Magee, K.M.\* and **C.E. Davenport**, 2017: An Observational Study on Quantifying the Distance to Supercell-Boundary Interactions in the Great Plains. *17<sup>th</sup> Conference on Mesoscale Processes*, San Diego, CA, American Meteorological Society, Paper 38. Extended abstract available at <https://ams.confex.com/ams/17MESO/webprogram/Paper319834.html>.
70. **Davenport, C.E.**, 2017: The Fundamentals in Meteorology Inventory: Results from the Development of a New Meteorology Education Tool. *114<sup>th</sup> Annual Meeting of the North Carolina Academy of Science*, High Point, NC, North Carolina Academy of Science. Abstract available at <http://www.highpoint.edu/ncas2017/files/2017/03/book-of-abstracts.pdf>.
71. **Davenport, C.E.**, M.I. Biggerstaff, and C.L. Ziegler, 2016: Assessment of the Base-State Substitution Idealized Modeling Technique. *28<sup>th</sup> Conference on Severe Local Storms*, Portland, OR, American Meteorological Society, Paper 129. Extended abstract available at <https://ams.confex.com/ams/28SLS/webprogram/Paper300698.html>.

72. Gropp, M.\* and **C.E. Davenport**, 2016: Assessing the Impact of the Nocturnal Transition on the Lifetime and Evolution of Supercell Thunderstorms in the Great Plains. *28<sup>th</sup> Conference on Severe Local Storms*, Portland, OR, American Meteorological Society, Paper 32. Extended abstract available at <https://ams.confex.com/ams/28SLS/webprogram/Paper300965.html>.
73. Magee, K.M.\* and **C.E. Davenport**, 2016: Quantifying the Distance to Supercell-Boundary Interactions. *28<sup>th</sup> Conference on Severe Local Storms*, Portland, OR, American Meteorological Society, Paper 33. Extended abstract available at <https://ams.confex.com/ams/28SLS/webprogram/Paper300810.html>.
74. Bunker, E.\*, C. Ledbetter\*, **C.E. Davenport**, and M.D. Eastin, 2016: The Interaction of Supercell Thunderstorms with the Appalachian Mountains. *UNC Charlotte Undergraduate Research Conference*, Charlotte, NC.
75. **Davenport, C.E.**, 2016: Using Worked Examples to Improve Student Understanding and Problem-Solving Skills. *25<sup>th</sup> Symposium on Education, 96<sup>th</sup> American Meteorological Society Annual Meeting*, New Orleans, LA, American Meteorological Society, Paper 6.7. Extended abstract available at <https://ams.confex.com/ams/96Annual/webprogram/Paper280167.html>.
76. **Davenport, C.E.**, 2015: Addressing the Efficacy of the Base-State Substitution Technique: A Comparison of Simulations. *16<sup>th</sup> Conference on Mesoscale Processes*, Boston, MA, American Meteorological Society, Paper 25. Extended abstract available at <https://ams.confex.com/ams/16Meso/webprogram/Paper274326.html>.
77. Ledbetter, C.\*, E. Bunker\*, **C.E. Davenport**, and B.I. Magi, 2015: Arduino Weather Station. *UNC Charlotte Undergraduate Research Conference*, Charlotte, NC.
78. **Davenport, C.E.**, A.J. French, T.L. Koehler, and D.R. Vollmer, 2015: The Fundamentals in Meteorology Inventory: Motivation and Development of a New Meteorology Education Tool. *24<sup>th</sup> Symposium on Education, 95<sup>th</sup> American Meteorological Society Annual Meeting*, Phoenix, AZ, American Meteorological Society, Paper 7.2. Extended abstract available at <https://ams.confex.com/ams/95Annual/webprogram/Paper258622.html>.

## Grants Awarded

### *External*

1. **REU Site: Research Experiences and Mentorship in Urban Systems (REMUS)**  
National Science Foundation (\$426,730)



September 2023 – August 2026

Principal Investigators: S. Clinton (UNC Charlotte) and **C.E. Davenport**

2. **Characteristics and Evolution of Observed and Simulated Supercell Thunderstorms in the Central and Southern Appalachians**

National Oceanic and Atmospheric Administration: Collaborative Science, Technology, and Applied Research (\$429,089)

June 2019—May 2024

Principal Investigators: **C.E. Davenport** and M. Eastin (UNC Charlotte)

*Internal*

1. **Evaluating the Sensitivity of Supercell Thunderstorm Behavior Near Complex Terrain Using Idealized Simulations**

UNC Charlotte Faculty Research Grant (\$8,000)

July 2023 – June 2024

Principal Investigator: **C.E. Davenport**

2. **Characterizing the Growth of Spatial Thinking Abilities Across Meteorology Courses**

UNC Charlotte Scholarship of Teaching and Learning Grant (\$10,090)

January 2022 – June 2023

Principal Investigator: **C.E. Davenport**

3. **Quantifying the Impact of Climate Change on the Characteristics and Local Environments of Supercell Thunderstorms**

UNC Charlotte Faculty Research Grant (\$8,000)

January 2019 – May 2020

Principal Investigator: **C.E. Davenport**

4. **Using Worked Examples to Enhance Learning in an Upper-Level Meteorology Course**

UNC Charlotte Scholarship of Teaching and Learning Grant (\$8,700)

January 2018 – May 2019

Principal Investigator: **C.E. Davenport**

5. **Measuring Thunderstorm Environment Variability in North Carolina**

UNC Charlotte Faculty Research Grant (\$5,814)

January 2015 – May 2016

Principal Investigator: **C.E. Davenport**



## TEACHING & INSTRUCTIONAL ACTIVITY

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### Courses Taught (UNC Charlotte only)

Semester	Course Title	Course Number	Enrollment
Spring 2024	Dynamic Meteorology I (3 cr)	METR 3250	16 undergrad
Fall 2023	Meteorological Computer Applications (3 cr)	METR 4105/ESCI 5105	17 undergrad/1 grad
	Advanced Dynamic Meteorology (3 cr)	METR 4250/ESCI 5250	15 undergrad
	Numerical Modeling of the Earth System (3 cr)	ESCI 6120/INES 8120	6 grad
	Independent Study (1 cr)	METR 4800	1 undergrad
Spring 2023	Dynamic Meteorology I (3 cr)	METR 3250	18 undergrad
	Meteorological Computer Applications (3 cr)	METR 4105/ESCI 5105	14 undergrad
	Independent Study (3 cr)	GEOG 8005	1 grad
Fall 2022	Advanced Dynamic Meteorology (3 cr)	METR 4250/ESCI 5250	10 undergrad
	Teaching & Learning in the Geosciences (3 cr)	ESCI 6000/GEOG 6005/GEOG 8005	8 grad
Spring 2022	Dynamic Meteorology I (3 cr)	METR 3250	13 undergrad
	Meteorological Computer Applications (3 cr)	METR 4105/ESCI 5105	16 undergrad
	Independent Study (1 cr)	METR 4800	1 undergrad
Fall 2021	Advanced Dynamic Meteorology (3 cr)	METR 4250/ESCI 5250	9 undergrad
	Numerical Modeling of the Earth System (3 cr)	ESCI 6120/INES 8090	7 grad
	Independent Study (1 cr)	METR 4800	1 undergrad
	Independent Study (1 cr)	METR 4800	1 undergrad
Spring 2021	Dynamic Meteorology I (3 cr)	METR 3250	12 undergrad
	Meteorological Computer Applications (3 cr)	METR 4105/ESCI 5105	16 undergrad/1 grad
	Independent Study (3 cr)	METR 4800	1 undergrad
Fall 2020	Advanced Dynamic Meteorology (3 cr)	METR 4250/ESCI 5250	10 undergrad/2 grad
	Numerical Modeling of the Earth System (3 cr)	ESCI 6120/INES 8090	8 grad
Spring 2020	Dynamic Meteorology I (3 cr)	METR 3250	11 undergrad
Fall 2019	Meteorological Computer Applications (3 cr)	METR 4105/ESCI 5105	15 undergrad/3 grad
	<i>On Leave</i>		
Spring 2019	Dynamic Meteorology I (3 cr)	METR 3250	8 undergrad
	Meteorological Computer Applications (3 cr)	METR 4105/ESCI 5105	15 undergrad/4 grad
	Independent Study (3 cr)	METR 4800	1 undergrad
Fall 2018	<i>On Leave</i>		
Spring 2018	Dynamic Meteorology I (3 cr)	METR 3250	15 undergrad
	Meteorological Computer Applications (3 cr)	METR 4105/ESCI 5105	15 undergrad/2 grad
	Independent Study (3 cr)	METR 4800	1 undergrad
Fall 2017	Advanced Dynamic Meteorology (3 cr)	METR 4250	7 undergrad
	Numerical Modeling of the Earth System (3 cr)	ESCI 6000/INES 8090	5 grad
	Independent Study (3 cr)	METR 4800	1 undergrad
	Independent Study (3 cr)	METR 4800	1 undergrad
Spring 2017	Dynamic Meteorology I (3 cr)	METR 3250	10 undergrad
	Meteorological Computer Applications (3 cr)	METR 4105/ESCI 5105	15 undergrad
Fall 2016	<i>On Leave</i>		
Spring 2016	Dynamic Meteorology I (3 cr)	METR 3250	14 undergrad
	Meteorological Computer Applications (3 cr)	METR 4000/ESCI 5000	10 undergrad/3 grad
	Independent Study (3 cr)	METR 4800	1 undergrad
Fall 2015	Advanced Dynamic Meteorology (3 cr)	METR 4250	14 undergrad
	Numerical Modeling of the Earth System (3 cr)	ESCI 6000/INES 8090	6 grad
Spring 2015	Dynamic Meteorology I (4 cr)	METR 3250	16 undergrad
	Independent Study (1 cr)	METR 4800	1 undergrad
Fall 2014	Advanced Dynamic Meteorology (3 cr)	METR 4250	8 undergrad

## Students Advised

### ***In Progress***

#### Advisor

1. Matthew Gropp, Ph.D. Infrastructure and Environmental Systems, Fall 2017 – present (currently ABD).  
*Dissertation: “Storm Scale Impacts of Business as Usual Climate Change on Supercell Thunderstorms”*
2. Logan Twohey, Ph.D. Geography, Fall 2022 – present.  
*Thesis: “Evaluating the Sensitivity of Supercell Thunderstorms Interacting with the Appalachian Mountains Using Idealized Simulations”*
3. Roger Riggan, Ph.D. Infrastructure and Environmental Systems, Fall 2023 – present.  
*Dissertation topic: “Thunderstorm Evolution Near the Chesapeake Bay”*
4. Jasen Greco, M.S. Earth Sciences, Fall 2022 – present.  
*Thesis: “Idealized Simulations of Supercells Interacting with Stationary Boundaries”*
5. Ethan O’Neill, M.S. Earth Sciences, Fall 2023 – present.  
*Thesis: “The Sensitivity of the Impact of Cell Mergers on Supercell Thunderstorms Before vs. After Sunset”*

#### Committee Member

1. Payam Mohammadi, Ph.D. Infrastructure and Environmental Systems (S. Pilkington, Committee Chair)

### ***Completed***

#### Advisor

1. Olivia Massey, B.S. Meteorology, Fall 2023.  
*Topic: “Environmental Evolution of the 15 March 2008 Long-Lived Supercell”*
2. Lauren Decker, M.S. Earth Sciences, Fall 2021 – Spring 2023.  
*Thesis: “Characterizing the Growth in Spatial Thinking Abilities in Meteorology Students Across the Curriculum”*
3. Roger Riggan, M.S. Earth Sciences, Fall 2020 – Fall 2022.  
*Thesis: “Idealized Simulations of Supercell Thunderstorms Interacting with the Appalachian Mountains”*
4. Jasen Greco, Independent study, B.S. Meteorology, Spring 2022.

- Topic: "Comparison of High-Shear, Low-CAPE Severe Events in the Great Plains and Southeastern U.S."*
5. Jasen Greco, Independent study, B.S. Meteorology, Fall 2021.  
*Topic: "Case Study of the 6 February 2020 Charlotte Region Tornadoes"*
  6. Lauren Decker, Independent study, B.S. Meteorology, Spring 2021.  
*Topic: "Case Study of the 2 March 2012 Southern Indiana Tornado Outbreak"*
  7. Lindsay Hochstatter, M.S. Earth Sciences, Fall 2019 – Spring 2021.  
*Thesis: "The Temporal Evolution of Tornadic vs. Non-Tornadic High Shear Low CAPE Environments"*
  8. Katie McKeown, M.S. Earth Sciences, Fall 2019 – Spring 2021.  
*Thesis: "Radar Characteristics of Observed Supercell Thunderstorms Interacting with the Appalachian Mountains"*
  9. Sarah Purpura, M.S. Earth Sciences, Fall 2019 – Spring 2021.  
*Thesis: "Environmental Evolution of Supercells Interacting with the Appalachian Mountains"*
  10. Luke Rosamond, B.S. Meteorology, Summer 2020.  
*Topic: "Evaluation of Tornadoes in Hurricane Dorian"*
  11. Richard Sirico, M.S. Earth Sciences, Fall 2018 – Spring 2020.  
*Thesis: "Investigation of the Environmental Influences Related to the Precipitation Structure of Supercell Thunderstorms and Their Evolution"*
  12. Austin Mansfield, M.S. Earth Sciences, Fall 2017 – Spring 2019.  
*Thesis: "The Temporal Evolution of Tornadic and Non-tornadic VORTEX2 Near-storm Environments"*
  13. Jan Ising, Honors Thesis, B.S. Meteorology, Fall 2018 – Spring 2019.  
*Thesis: "Investigating Causes for Crossing Potential of Supercell Thunderstorms Within the Appalachian Mountains"*
  14. Cody Ledbetter, M.S. Earth Sciences, Fall 2016 – Fall 2018.  
*Thesis: "Analyzing Supercell Intensity Changes in a Heterogeneous Environment in the VORTEX2 Supercell Pair in Southeastern Colorado on 11 June 2009"*
  15. Kathleen Magee, M.S. Earth Sciences, Fall 2015 – Spring 2017.  
*Thesis: "An Observational Study on Quantifying the Distance of Supercell-Boundary Interactions in the Great Plains"*
  16. Matthew Gropp, M.S. Earth Sciences, Fall 2015 – Spring 2017.  
*Thesis: "Assessing the Impact of the Evening Transition on the Evolution and Lifetime of Supercell Thunderstorms in the Great Plains"*

17. Richard Sirico, Independent Study, B.S. Meteorology, Fall 2017 – Spring 2018.  
*Topic: “Assessing Spatial and Temporal Changes in the Environment on the Evolution of Convection in a High Shear, Low Instability Event in North Carolina”*
18. Cody Ledbetter, Honors Thesis, B.S. Meteorology, Fall 2015 – Spring 2016.  
*Thesis: “The Interaction of Supercell Thunderstorms with the Appalachian Mountains”*
19. Cody Ledbetter, Independent Study, B.S. Meteorology, Spring 2015.  
*Topic: “Arduino Weather Station”*

### Committee Member

1. Christian Boyer, Ph.D. Earth and Ecosystem Science (Central Michigan University; Committee Chair, J. Keeler), graduated Spring 2023.  
*Dissertation: “Idealized Simulations of Destabilization and Convection Initiation in Coastal Regions”*
2. Xiaoyu Bai, Ph.D. Infrastructure and Environmental Systems (J. Scheff, Committee Chair), graduated May 2022.  
*Dissertation: “Energetic Theory and Hadley Cells at a Seasonal Scale: How Will ITCZ Respond to a Warming Climate”*
3. Matt Toadvine, M.S. Earth Sciences (M. Eastin, Committee Chair), graduated May 2022.  
*Thesis: “Comparing the Tornadic Environments Among East Coast and Gulf Coast Landfalling Tropical Cyclones”*
4. Maya Robinson, M.S. Earth Sciences (J. Scheff, Committee Chair), graduated December 2021.  
*Thesis: “Constraining the Northern Hemisphere Mid-Latitude Jet Response to Climate Change in CMIP6 Using the Arctic Minus Subtropical Warming”*
5. Scott Dennstaedt, Ph.D. Infrastructure and Environmental Systems (M. Eastin, Committee Chair), graduated May 2021.  
*Dissertation: “Targeted Approach to Providing Weather Guidance to General Aviation Pilots Based on Estimated Time of Departure and Personal Weather Minimums”*
6. Anna Stuck, M.S. Earth Sciences (M. Eastin, Committee Chair), graduated December 2020.  
*Thesis: “Development of a Forecasting Technique for the Charlotte Urban Heat Island Intensity”*

7. Rachel Cucinotta, M.S. Earth Sciences (M. Eastin, Committee Chair), graduated August 2019.  
*Thesis: "Diagnosing Thunderstorm Induced Power Outages with the Rapid Refresh Model"*
8. Stephanie Edwards, M.S. Earth Sciences (B. Magi, Committee Chair), graduated May 2018.  
*Thesis: "Analyzing the Use of Satellite Microwave Remote Sensing Data for Lightning Estimations in the Southeastern United States"*
9. Ryan Hubler, M.S. Earth Sciences (M. Eastin, Committee Chair), graduated May 2016.  
*Thesis: "Initiation and Enhancement of Local Precipitating Convection by the Charlotte Urban Heat Island"*
10. Thomas Winesett, M.S. Earth Sciences (B. Magi, Committee Chair), graduated May 2015.  
*Thesis: "Using Microwave Remote Sensing to Estimate Cloud-to-Ground Lightning Over Land for the Contiguous United States"*
11. Brandy Stimac, M.S. Earth Sciences (M. Eastin, Committee Chair), graduated May 2015.  
*Thesis: "Structural Variation of Offshore Supercells in Outer Rainbands of Hurricane Rita (2005)"*

## **SERVICE**

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### Public and Community Service

#### **Invited Presentations**

1. *Lifelong Learning Salon, Aldersgate Senior Living* (October 2023): "It Never Happens Here': Unpacking the True Relationship Between Tornadic Thunderstorms and Terrain"
2. *Infrastructure and Environmental Systems Seminar, UNC Charlotte* (September 2023): "How Does the Local Environment Influence Thunderstorm Behavior?"
3. *American Meteorological Society Student Conference* (January 2023): "Developing and Inspiring the Next Generation of Scientists: An Overview of Research in Teaching and Learning in the Atmospheric Sciences"
4. *Department of Atmospheric Sciences, Texas A&M University* (March 2022): "Be the Storm: Perspective Taking and Quantifying Environmental Changes Experienced by Long-Lived Supercells"

5. *Department of Mathematical Sciences, University of Wisconsin-Milwaukee* (October 2020): “Environmental Evolution of Long-Lived Supercell Thunderstorms”
6. *Department of Oceanography, United States Naval Academy* (February 2020): “Enhancing Student Success in Quantitatively-Intensive Courses Through Worked Examples”
7. *Department of Marine, Earth, & Atmospheric Sciences, North Carolina State University* (August 2018): “Embracing an Evidence-Based Approach to Teaching Quantitatively-Intensive Geoscience Courses”
8. *Carolinas Aviation Museum Girls STEM Camp* (April 2018; December 2018): “My Journey to STEM”
9. *Cabarrus-Kannapolis Early College High School* (October 2017): “Hurricanes”
10. *Greensboro Science Café* (September 2017): “Severe Thunderstorms”
11. *Charlotte Weather Fest* (March 2015, 2016, 2017, 2018, 2019): “Severe Thunderstorms”
12. *Department of Atmospheric Science, Colorado State University* (March 2014): “Base-State Substitution: An Idealized Modeling Technique for Approximating Environmental Heterogeneity”
13. *Females Learning About Science Here, Discovery High School, Colorado Springs, Colorado* (January 2014): “How Weather Works”

### Television Interviews

1. WSOC TV (January 2024): January tornado activity in the Southeastern U.S.
2. Spectrum News (April 2017): Potential benefits of installing a new National Weather Service radar in Charlotte
3. Time Warner Cable News (January 2017): Increase in tornado deaths in 2017

### Invited Guest Lectures

1. UNC Charlotte Camps on Campus (June 2015): “Storm Chasers!”  
*Note: This was a week-long camp, wherein I gave numerous lectures and led daily activities designed for middle-school students*
2. UNC Charlotte INES 8102 Infrastructure Systems (September 2014): “Structures and Severe Weather”
3. UNC Charlotte ESCI 6600 Earth Sciences Seminar (September 2014): “Supercell Evolution in a Temporally Varying Environment”

## Other

1. *Panel Participant*, American Meteorological Society Webinar on Graduate School Applications (November 2022)
2. *Student Presentation and Poster Judge*, 30<sup>th</sup> Conference on Severe Local Storms (October 2022)
3. *Mentor*, National Weather Service Virtual Speed Mentoring Event (April 2022)
4. *Student Presentation Judge*, Final Project Presentations, MEA 507: Discipline-Based Education Research in the Geosciences, North Carolina State University (May 2021)
5. *Panel Participant: Promoting Geoscience Research, Education, and Success Workshop*, Charlotte, North Carolina (October 2015)
6. *Student Poster Judge*, Introduction to Meteorological Remote Sensing Final Project, North Carolina State University (April 2015)
7. *Volunteer*, UNC Charlotte STEM Day (October 2014)
8. *Volunteer*, Girls in the Middle Conference, Otero Junior College, La Junta, Colorado (March 2013, 2014)

## University, College, and Departmental Service

1. **Committee Member:** Faculty Council, College of Humanities and Earth and Social Sciences, UNC Charlotte (Fall 2023 – present)
2. **Committee Member:** Department Review Committee, Department of Geography and Earth Sciences, UNC Charlotte (Fall 2023 – present)
3. **Committee Member:** Graduate Advisory Committee, Department of Geography and Earth Sciences, UNC Charlotte (Fall 2021 – Spring 2023)
4. **Committee Member:** Diversity, Equity, Inclusion Working Group, Department of Geography and Earth Sciences, UNC Charlotte (Fall 2020 – Spring 2022)
5. **Committee Chair:** CLAS Teaching Awards Committee, College of Liberal Arts and Sciences, UNC Charlotte (Spring 2020)
6. **Committee Member:** CLAS Teaching Awards Committee, College of Liberal Arts and Sciences, UNC Charlotte (Spring 2019)
7. **Committee Member:** Faculty Advisory Committee, Department of Geography and Earth Sciences, UNC Charlotte (Fall 2017 – Spring 2018)



8. **Committee Member:** Search Committee for Hydrometeorologist/Ecohydrologist, Department of Geography and Earth Sciences, UNC Charlotte (Fall 2015 – Spring 2016)
9. **Committee Member:** Web and Internet Technology, Department of Geography and Earth Sciences, UNC Charlotte (Fall 2015 – Spring 2016)
10. **Committee Member:** McEniry Building Redesign (Computer Labs), Department of Geography and Earth Sciences, UNC Charlotte (Spring 2015)
11. **Committee Member:** Department Speaker Series, Department of Geography and Earth Sciences, UNC Charlotte (Fall 2014 – Spring 2016)

### Professional Service

#### **Journals**

1. Editor, *Journal of Operational Meteorology*, 2022 – present
2. Associate Editor, *Monthly Weather Review* journal, 2015 – 2023
3. Associate Editor, *Weather and Forecasting* journal, 2016 – 2019
4. Manuscript Reviewer, *Atmosphere*, *Journal of Geoscience Education*, *Journal of Astronomy and Earth Sciences Education*, *Bulletin of the American Meteorological Society*, *Quarterly Journal of the Royal Meteorological Society*, *Weather and Climate Dynamics*, ad-hoc since 2018

#### **Committees**

1. Co-Chair, Unidata User's Committee, 2024 – present
2. Committee Member, Unidata User's Committee, 2018 – 2023
3. Committee Member, American Meteorological Society Committee on Severe Local Storms, 2018 – present
4. Committee Member, North Carolina Academy of Sciences Publications Committee, May 2015 – May 2023
5. Faculty Co-Chair, American Meteorological Society Student Conference, 2020 – 2022

#### **Grants and Applications**

1. Grant Reviewer, National Science Foundation (Division of *Atmospheric and Geospace Sciences*), adhoc since 2016

2. Grant Reviewer, National Oceanic and Atmospheric Administration, ad-hoc since 2015
3. Scholarship Reviewer, American Meteorological Society, 2019
4. Application Reviewer, National Science Foundation (*Graduate Research Fellowship Program*), 2016

### **Conferences and Other Meetings**

1. Co-Chair, American Meteorological Society Severe Local Storms Conference 2024, Fall 2022 – present
2. Co-Facilitator, “Designing Student-Centered Activities to Increase Engagement and Learning within Atmospheric Dynamics Courses” two-day workshop, Earth Educators’ Rendezvous, July 2023
3. Co-Convener, “Teaching Atmospheric Dynamics to Improve Learning and Engagement” mini-workshop, Earth Educators’ Rendezvous, July 2022
4. Co-Organizer, American Meteorological Society Severe Local Storms Virtual Conference for Students and Early Career Scientists, 2021
5. Poster Session Co-Chair, Earth Educators’ Rendezvous, July 2021
6. Co-Organizer, American Meteorological Society Special Collection on Atmospheric Science Education Research, 2021
7. Student Presentation Judge, American Geophysical Union Fall Meeting, December 2020
8. Session Chair, American Meteorological Society 29<sup>th</sup> Conference on Severe Local Storms, October 2018
9. Student Presentation Judge, North Carolina Academy of Science 114<sup>th</sup> Annual Meeting, March 2017
10. Session Co-Chair, American Meteorological Society 16<sup>th</sup> Conference on Mesoscale Processes, August 2015
11. Student Presentation Judge, American Meteorological Society 16<sup>th</sup> Conference on Mesoscale Processes, August 2015
12. Session Chair, American Meteorological Society 26<sup>th</sup> Conference on Severe Local Storms, November 2012

### **RECOGNITION, HONORS, & AWARDS**

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1. **Outstanding Early Career Award**, *AMS Scientific and Technological Activities Commission on behalf of the Committee on Mesoscale Processes*, July 2023
2. **Cover Page**, *Journal of Geoscience Education*, April 2020
3. **Editor's Award**, *Weather and Forecasting*, American Meteorological Society (January 2020)
4. **"Papers of Note" Highlighted in *Bulletin of the AMS***: Creating a More Realistic Idealized Supercell Thunderstorm Evolution via Incorporation of Base-State Environmental Variability (November 2019)
5. **Integration of Undergraduate Teaching and Research Award**, College of Liberal Arts and Sciences, UNC Charlotte (April 2018)
6. **Dr. Tyrel Moore Mentorship Award**, Department of Geography and Earth Sciences, UNC Charlotte (May 2017)
7. **Faculty Appointment**, UNC Charlotte Honors program (May 2016 – present)
8. **Faculty Appointment**, UNC Charlotte Infrastructure and Environmental Systems Ph.D. program (December 2014 – present)
9. **Faculty Appointment**, UNC Charlotte Graduate Faculty (October 2014 – present)
10. **Award for Civilian Achievement**, Department of the Air Force (May 2014)
11. **Basic Sciences Division Team of the Year** (*Member of the Department of Physics STEM Outreach Team*), United States Air Force Academy (May 2013)
12. **Best Student Poster**, 24<sup>th</sup> Conference on Severe Local Storms, American Meteorological Society (October 2008)

## PROFESSIONAL MEMBERSHIPS

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1. National Association of Geoscience Teachers, 2017 – present
2. National Science Teachers Association, 2015 – present
3. American Geophysical Union, 2014 – present
4. National Weather Association, 2013 – present
5. American Meteorological Society, 2003 – present
6. North Carolina Academy of Science, 2015 – 2022