

Jason M. Keeler
Central Michigan University
Brooks Hall 325
Mount Pleasant, MI 48859

Areas of Specialization

Atmospheric Convection, Mesoscale & Synoptic Dynamics, Severe Storms, Boundary Layer Meteorology, Lake-Effect Storms, Coastal Meteorology & Sea Breezes, Urban Heat Islands, Radar Meteorology, Atmospheric Models, Unmanned Aircraft Systems, and Field Research.

Education

Ph.D., Atmospheric Sciences	The University of Illinois, 2015
M.S., Atmospheric Sciences	The University of Illinois, 2010
B.S., Meteorology, cum laude	State University of New York Oswego, 2007

Research Positions Held Since Ph.D.

Central Michigan University Assistant Professor of Meteorology	July 2018 - present
University of Nebraska-Lincoln Postdoctoral Research Associate	December 2015 - June 2018

Student Positions Held

Graduate Research Assistant (during Ph.D.)

Dept. of Atmospheric Sciences, University of Illinois
Advisor: Robert Rauber

NCAR ASP Graduate Fellowship (January 2013 – January 2014)

NCAR Research Applications Laboratory Hydrometeorological Applications Program

Graduate Research Assistant (during M.S.)

Dept. of Atmospheric Sciences & The Illinois State Water Survey, University of Illinois
Advisor: David Kristovich

Peer-Reviewed Publications

Houston, A. L., and **J. M. Keeler**, 2018: The impact of sensor response and airspeed on the representation of the convective boundary layer and airmass boundaries by small unmanned aircraft systems. *J. Atmos. Oceanic Technol.*, In Press.

Rosenow, A. A., R. M. Rauber, B. F. Jewett, G. M. McFarquhar, and **J. M. Keeler**, 2018: Elevated potential instability in the comma-head: Distribution and development. *Mon. Wea. Rev.*, **146**, 1259-1278.

Keeler, J. M., R. M. Rauber, B. F. Jewett, G. M. McFarquhar, R. M. Rasmussen, L. Xue, C. Liu, and G. Thompson, 2017. Dynamics of cloud-top generating cells in winter cyclones. Part III: Shear and convective organization. *J. Atmos. Sci.*, **74**, 2879–2897.

Keeler, J. M., B. F. Jewett, R. M. Rauber, G. M. McFarquhar, R. M. Rasmussen, L. Xue, C. Liu, and G. Thompson, 2016: Dynamics of cloud-top generating cells in winter cyclones. Part II: Radiative and instability forcing. *J. Atmos. Sci.*, **73**, 1529–1553.

Keeler, J. M., B. F. Jewett, R. M. Rauber, G. M. McFarquhar, R. M. Rasmussen, L. Xue, C. Liu, and G. Thompson, 2016: Dynamics of cloud-top generating cells in winter cyclones. Part I: Idealized simulations in the context of field observations. *J. Atmos. Sci.*, **73**, 1507–1527.

Rauber, R. M., D. M. Plummer, M. K. Macomber, A. A. Rosenow, G. M. McFarquhar, B. F.

- Jewett, D. Leon, N. Owens, and **J. M. Keeler**, 2015: The role of cloud-top generating cells and boundary-layer circulations in the fine-scale radar structure of a winter cyclone over the Great Lakes. *Mon. Wea. Rev.*, **143**, 2291–2318.
- Rauber, R. M., M. Macomber, D. M. Plummer, A. A. Rosenow, G. M. McFarquhar, B. F. Jewett, D. Leon, and **J. M. Keeler**, 2014: Fine scale radar and airmass structure of the comma head of a continental winter cyclone—the role of three airstreams. *Mon. Wea. Rev.*, **142**, 4207–4229.
- Rauber, R. M., J. Wegman, D. M. Plummer, A. A. Rosenow, M. Peterson, G. M. McFarquhar, B. F. Jewett, D. Leon, P. S. Market, K. R. Knupp, **J. M. Keeler**, and S. Battaglia, 2014: Stability and charging characteristics of the comma-head region of continental winter cyclones. *J. Atmos. Sci.*, **71**, 1559–1582.
- Keeler, J. M.**, and D. A. R. Kristovich, 2012: Observations of Urban Heat Island influence on lake-breeze frontal movement. *J. Appl. Meteor. Climatol.*, **51**, 702–710.
- Steiger, S. M., R. Hamilton, **J. Keeler**, and R. E. Orville, 2009: Lake-effect thunderstorms in the lower Great Lakes. *J. Appl. Meteor. Climatol.*, **48**, 889–902.

Grants and Fellowships Received

- Keeler, J. M.**, 1/28/13-1/28/14: Advanced Study/Graduate Visitor Program Fellowship, National Center for Atmospheric Research, **\$14.25 K**.
- Keeler, J. M.**, and S. M. Steiger, 2006-2007: Student-Faculty Collaborative Challenge Grant, “Climatology of Lightning in Lake-Effect Storms in the Lower Great Lakes”, SUNY Oswego Scholarly and Creative Activities Committee, **\$2.5 K**.
- Keeler, J. M.**, 6-8/2006: MSRC Undergraduate Summer Fellowship, Mentor: Brian Colle, Stony Brook University, **\$3 K** approx.

Teaching Experience

Teaching Assistantship, Department of Atmospheric Sciences, University of Illinois
Responsibilities common to the listed courses below included grading, and collaboration on development of homework, quizzes, exams, and lab assignments.

1. **Severe and Hazardous Weather (undergraduate)**
Fall 2007; managed 150 students; Instructor: Mr. Eric Snodgrass.
2. **Introduction to Meteorology (undergraduate)**
Spring 2008; managed 90 students; Professor: Dr. Donna Charlevoix
 - Selected for Atmospheric Sciences departmental teaching award for this course.
 - Developed lab on lake-effect storm forecasting and corresponding exam questions.
 Fall 2011; managed 105 students; Instructor: Dr. Jeffrey Frame
 - Designated by University of Illinois as a “Teacher Rated as Excellent” based on student reviews of my lab sections.
3. **Radar Remote Sensing (graduate/undergraduate)**
Fall 2010; managed 48 students; Professor: Dr. Robert Rauber
 - Co-developed DOW radar project featured in University of Illinois alumni magazine.
 - Developed assignments introducing students to GR2Analyst and Solo II radar software.
 - Developed and gave lectures on radial velocity signatures of convective and stratiform cloud systems.
4. **Synoptic Weather Forecasting (upper-class undergraduate)**
Spring 2012; managed 25 students; Instructor: Dr. Jeffrey Frame

5. **Mesoscale Dynamics (*upper-class undergraduate*)**
Spring 2012; managed 15 students; Instructor: Dr. Jeffrey Frame

Invited Substitute Lectures

Topic: Dynamics of Cloud-top Convection in Winter Cyclones

Course: Mesoscale Meteorology (500-level; Fall 2014)

Topic: Interactions Between Sea-Breezes and Urban Heat Islands

Course: Mesoscale Dynamics (300-level; Spring 2009)

Topic: Lake-Effect Storms: Forecasting and Impacts

Course: Severe and Hazardous Weather (100-level; Fall 2008, Spring 2009)

Education and Curriculum Development Certification

STRIPE-EBIT (Summer Teaching-as-Research Institute for Postdocs in Engineering – Evidence-Based Introduction to Teaching), July 24-28 2017.

STRIPE-EBIT is a student-centered workshop where postdocs and new faculty develop curricula using evidence-based teaching methods. It includes educational research techniques, [CIRTL topics](#), and seminal disciplinary education research findings.*

American Meteorological Society Short Course:

Atmospheric Science Education Research: A Beginner’s Guide, January 7 2018.

Field Work

Rivers of Vorticity in Supercells (RiVorS; Great Plains; 5-6/2017)

- Forecast and unmanned aircraft system deployment guidance
- Mobile mesonet operation

Program for Research on Elevated Convection with Intense Precipitation (PRECIP; Great Plains; 6/2016)

- Forecast and unmanned aircraft system deployment guidance

Storm (Colorado; 6/2016)

- Forecast and unmanned aircraft system deployment guidance

Ontario Winter Lake-effect Systems (OWLeS; Whitby, Ontario; 12/2013)

- Rawinsonde launches

SUNY Oswego Storm Forecasting and Observation Program (5/2012)

- Forecast guidance, travel logistics, rawinsonde launches

Pilot Project on Marine Boundary Layer Structure (Lake Michigan coast; 8/2010)

- Forecast guidance, travel logistics, rawinsonde launches

Profiling of Winter Storms (PLOWS; 1/2008 – 3/2010)

- Forecast guidance, flight- and ground-based radar operation, rawinsonde launches

Honors and Awards

NCAR ASP Graduate Fellowship	2013 (1 year)
Teacher Rated as Excellent (Univ. of Illinois)	Fall 2011
Ogura Student Teaching Award (Dept. of Atmos. Sci., Univ. of Illinois)	Spring 2008
Undergraduate Research Fellowship (Stony Brook University)	Summer 2006

Service, Leadership, and Professional Organizations

Associate , Center for the Integration of Research, Teaching and Learning (CIRTL) Network	2017 – present
Steering Committee Member , International Society for Atmospheric Research using Remotely piloted Aircraft (ISARRA)	2017 – 2018 Term
Proposal Reviewer , Undergraduate Creative Activities and Research Experience (UCARE) Assistantship at Univ. of Nebraska-Lincoln	Spring 2017
Reviewer , Elsevier (Journal of Atmospheric Research)	2016 – present
Volunteer Weather Educator , Urbana, IL Park District	2012
Reviewer , AMS (Monthly Weather Review, Journal of Applied Meteorology and Climatology, Journal of the Atmospheric Sciences, Weather and Forecasting)	2010 – present
Member , American Geophysical Union	2010 – present
President , Dept. of Atmos. Sci. Graduate Student Organization	2008 – 2009
Vice President , University of Illinois Student Chapter of the AMS	2008 – 2009
Lifetime Member , Omicron Delta Kappa: The National Leadership Honor Society	2007 – present
Lifetime Member , Sigma Xi: The Scientific Research Society	2007 – present
Member , American Meteorological Society	2004 – present

Invited Seminars

- Keeler, J. M.**, October 2017: A tale of two seasons: Warm- and cool-season topics of interest to Chicagoans, *Chicago Chapter of the AMS*, Chicago, IL.
- Keeler, J. M.**, December 2016: Dynamics and organization of cloud-top convection in winter cyclones. *University of Wyoming*, Laramie, WY.
- Keeler, J. M.**, November 2016: Strategies for Unmanned Aircraft System (UAS) deployment near supercell thunderstorms. *University of Northern Colorado*, Greeley, CO.
- Keeler, J. M.**, B. F. Jewett, R. M. Rauber, G. M. McFarquhar, D. M. Plummer, A. A. Rosenow, R. M. Rasmussen, L. Xue, C. Liu, and G. Thompson, October 2015: Radiative and instability forcing of cloud-top generating cells in winter cyclones. *Colorado State University*, Fort Collins, CO.
- Keeler, J. M.**, B. F. Jewett, R. M. Rauber, G. M. McFarquhar, D. M. Plummer, A. A. Rosenow, R. M. Rasmussen, L. Xue, C. Liu, and G. Thompson, January 2015: Influence of diabatic processes on the dynamics of cloud-top generating cells in winter cyclones. *NCAR HAP Seminar Series*, Boulder, CO.
- Keeler, J. M.**, B. F. Jewett, R. M. Rauber, G. M. McFarquhar, D. M. Plummer, A. A. Rosenow, R. M. Rasmussen, L. Xue, C. Liu, and G. Thompson, October 2013: Dynamics of cloud-top generating cells in winter cyclones: effects of potential instability and radiation. *NCAR HAP Seminar Series*, Boulder, CO.
- Keeler, J. M.**, and D. A. R. Kristovich, 2010: Observations of lake-breeze frontal interaction with the Chicago urban heat island. *NWS Chicago Research Applications Day*, Romeoville, IL.
- Keeler, J. M.**, 2008: The SUNY Oswego storm forecasting and observation program. *Central Illinois Chapter of the American Meteorological Society Meeting*, Champaign, IL.

Keeler, J. M., and S. M. Steiger, 2007: Climatology of cloud-to-ground lightning in lake-effect storms. *Midwest Assessment Group for Investigations of Climate (MAGIC) Workshop*, Bloomington, IN.

Keeler, J. M., and S. M. Steiger, 2007: Cloud-to-ground lightning climatology for the lower Great Lakes. *NWS Buffalo Research Applications Day*, Buffalo, NY.

Conference Presentations and Seminars

Keeler, J. M., and A. L. Houston, 2018: Assimilation of UAS-supercell datasets in an OSSE framework. *22nd Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS), 98th AMS Annual Meeting*, Austin, TX.

Houston, A. L., and **J. M. Keeler**, 2018: The impact of sensor response on the representation of atmospheric boundary layer phenomena by airborne instruments. *22nd Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS), 98th AMS Annual Meeting*, Austin, TX.

Houston, A. L., G. Limpert, and **J. M. Keeler**, 2017: The potential impact of unmanned aircraft systems on storm-scale numerical weather prediction of supercells: Results from ensemble sensitivity analysis and observing system simulation experiments. *9th European Conference on Severe Storms*, Pula, Croatia.

Keeler, J. M., and A. L. Houston, 2017: Sensitivity of supercells to UAS data assimilation in an OSSE framework. *5th Conference of the International Society for Atmospheric Research using Remotely-piloted Aircraft*, Oban, Scotland.

Houston, A. L., and **J. M. Keeler**, 2017: The impact of sensor response on the representation of atmospheric boundary layer phenomena by airborne instruments. *5th Conference of the International Society for Atmospheric Research using Remotely-piloted Aircraft*, Oban, Scotland.

Keeler, J. M., and A. L. Houston, 2017: Synthetic UAS observations of an idealized supercell and boundary layer convection. *28th Conference on Weather Analysis and Forecasting/24th Conference on Numerical Weather Prediction Joint Session, 97th AMS Annual Meeting*, Seattle, WA.

Keeler, J. M., and A. L. Houston, 2016: Synthetic Unmanned Aircraft System observations of an idealized supercell thunderstorm. *28th Conference on Severe Local Storms*, Portland, OR.

Hanft, L. W., A. L. Houston, and **J. M. Keeler**, 2016: An observational and mesoscale modeling study of Mesoscale Airmasses with High Theta-E (MAHTEs). *28th Conference on Severe Local Storms*, Portland, OR.

Keeler, J. M., B. F. Jewett, R. M. Rauber, G. M. McFarquhar, R. M. Rasmussen, G. Thompson, L. Xue, and C. Liu, 2015: Dynamics of cloud-top generating cells in winter cyclones. *16th Conference on Mesoscale Processes*, Boston, MA.

Rosenow, A. A., R. M. Rauber, B. F. Jewett, G. M. McFarquhar, D. Leon, **J. M. Keeler**, and D. M. Plummer, 2015: Production and magnitude of elevated instability in the comma-head of continental winter cyclones. *16th Conference on Mesoscale Processes*, Boston, MA.

Keeler, J. M., B. F. Jewett, R. M. Rauber, G. M. McFarquhar, A. A. Rosenow, D. M. Plummer, D. Leon, R. M. Rasmussen, G. Thompson, L. Xue, and C. Liu, 2013: Comparisons of Wyoming Cloud Radar observations to simulations of precipitation generating cells in winter cyclones. *36th Conference on Radar Meteorology*, Breckenridge, CO.

- Rauber, R. M., J. P. Wegman, D. M. Plummer, A. A. Rosenow, M. K. Peterson, G. M. McFarquhar, B. F. Jewett, D. Leon, P. S. Market, K. R. Knupp, S. Battaglia, and **J. M. Keeler**, 2013: Stability and Charging Characteristics of the Comma-head Region of Continental Winter Cyclones. *36th Conference on Radar Meteorology*, Breckenridge, CO.
- Keeler, J. M.**, B. F. Jewett, R. M. Rauber, G. M. McFarquhar, D. M. Plummer, A. A. Rosenow, R. M. Rasmussen, and G. Thompson, 2013: Structure and kinematics of cloud-top precipitation generating cells in ultra-high-resolution idealized simulations of winter cyclones. *15th Conference on Mesoscale Processes*, Portland, OR.
- Keeler, J. M.**, B. F. Jewett, R. M. Rauber, D. M. Plummer, G. M. McFarquhar, R. M. Rasmussen, G. Thompson, L. Xue, and C. Liu, 2013: Understanding cloud-top precipitation generating cells through high-resolution modeling studies. *14th WRF Users' Workshop*, Boulder, CO.
- Keeler, J. M.**, B. F. Jewett, R. M. Rauber, and G. M. McFarquhar, 2012: Eliminating spurious numerical waves in high-resolution WRF simulations of winter cyclones. *13th WRF Users' Workshop*, Boulder, CO.
- Keeler, J. M.**, B. F. Jewett, R. M. Rauber, and G. M. McFarquhar, 2012: Eliminating spurious numerical waves in high-resolution WRF simulations of winter cyclones. *SESE Research Review*, Urbana, IL.
- Keeler, J. M.**, and D. A. R. Kristovich, 2010: Observations of lake-breeze frontal movement through the Chicago area. *SESE Research Review*, Urbana, IL.
- Keeler, J. M.**, 2010: Observations of Urban Heat Island Influence on Lake-Breeze Frontal Movement. *University of Illinois Dept. of Atmospheric Sciences Seminar*, Urbana, IL.
- Keeler, J. M.**, and D. A. R. Kristovich, 2009: Observations of spatially-variable lake-breeze movement in the vicinity of Chicago, IL. *34th Conference on Radar Meteorology*, Williamsburg, VA.
- Keeler, J. M.**, and D. A. R. Kristovich, 2009: Observations of spatially-variable lake-breeze movement in the vicinity of Chicago, IL. *13th Conference on Mesoscale Processes*, Salt Lake City, UT.
- Keeler, J. M.**, and D. A. R. Kristovich, 2009: Observations of the movement of lake-breeze fronts in the vicinity of Chicago, IL. *SESE Research Review*, Urbana, IL.
- Keeler, J. M.**, and D. A. R. Kristovich, 2009: An observational study of the movement of Lake Breeze Fronts in the vicinity of Chicago, IL. *AMS Annual Meeting Symposium on Urban High Impact Weather*, Phoenix, AZ.
- Keeler, J. M.**, S. M. Steiger, and R. Orville, 2008: Cloud-to-ground lightning climatology of the lower Great Lakes. *SESE Research Review*, Urbana, IL.
- Keeler, J. M.**, and D. A. R. Kristovich, 2008: Movement of the lake breeze front in the vicinity of Chicago, IL. *3rd Annual SUNY Oswego Lake-effect Conference*, Oswego, NY.
- Keeler, J. M.**, S. M. Steiger, and R. Orville, 2007: Cloud-to-ground lightning climatology of the lower Great Lakes. *AMS Annual Meeting Symposium on Connections Between Mesoscale Processes and Climate Variability*, San Antonio, TX.
- Steiger, S. M., R. Orville, and **J. Keeler**, 2007: Lake-effect thunderstorms, *AMS Annual Meeting Symposium on Connections Between Mesoscale Processes and Climate Variability*, San Antonio, TX.
- Keeler, J. M.**, and S. M. Steiger, 2007: A Climatology Cloud-to-Ground Lightning in Lake-effect Storms in the Lower Great Lakes. *2nd Annual SUNY Oswego Lake-effect Conference*, Oswego, NY.

- Keeler, J. M.**, and S. M. Steiger, 2007: Forecasting Lake-effect Thunderstorms, *32nd Annual Northeastern Storms Conference*, Springfield, MA.
- Keeler, J. M.**, and B. A. Colle, 2006: Initiation and Rapid Evolution of Convection in the NYC Metro Area on 1 June 2006. *SUNY Oswego Lake-effect Conference*, Oswego, NY.
- Keeler, J. M.**, and S. M. Steiger, 2006: Determining the Frequency of Lake-effect Storms with Cloud-to-Ground Lightning. *SUNY Oswego Lake-effect Conference*, Oswego, NY.
- Keeler, J. M.**, and B. A. Colle, 2006: Initiation and Rapid Evolution of Convection in the NYC Metro Area on 1 June 2006. *Stony Brook University Marine Sciences Research Center Undergraduate Fellowship Seminar*, Stony Brook, NY.