COREY K. POTVIN

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PRESENT POSITION

Research Meteorologist at the NOAA/OAR/National Severe Storms Laboratory (NSSL) specializing in convective-scale analysis, prediction, and predictability.

EDUCATION

Ph.D.	**Meteorology**	University of Oklahoma (OU)	Aug 2010
M.S.	**Meteorology**	OU	Aug 2006
B.S.	**Meteorology**	Lyndon State College (LSC)	May 2004
B.S.	**Mathematics**	LSC	May 2004
A.S.	**Computer Science**	LSC	May 2004

POSITIONS HELD

Feb 2019 – present	Research Meteorologist, NSSL
Sept 2014 – present	Adjunct/Affiliate Faculty, OU School of Meteorology
Oct 2012 – Feb 2019	Research Scientist, CIMMS/NSSL
Oct 2010 – Sept 2012	National Research Council Postdoctoral Research Associate, NSSL
Aug 2010 – Oct 2010	Postdoctoral Research Associate, CIMMS
Aug 2004 – Aug 2010	Graduate Research Assistant, OU School of Meteorology

SERVICE AND LEADERSHIP

NOAA AI4NWP Tiger Team (2024 – present)

Editor, *Artif. Intell. Earth Syst.*(2024 – present)

Editor, *Wea. and Forecasting* (2022 – present)

NOAA AI Working Group (2022 – present; Co-Chair 2023 – present)

NOAA Generative AI Working Group (2024 – 2025)

NOAA Enabling Observations into Models Working Group (2022 – present)

OU School of Meteorology Graduate Admissions Committee (2021 – 2023)

NSSL representative, Quantitative Observing System Assessment Program (2021 – present)

UFS CAM Application Team (2019 – present)

Associate Editor, *Mon. Wea. Rev.* (2018 – 2023)

Team Leader, NSSL Forecast Research & Development Division (2018 – 2022)

Participant, NOAA Hazardous Weather Testbed Spring Experiments (2011–2013, 2016–2018, 2020–2025)

Associate Editor, *Wea. and Forecasting* (2016 – 2021)

Scientific Steering Committee, VORTEX-SE (2016 – 2020)

AMS STAC Committee on Severe Local Storms (2015 – 2020)

Program Committee, 28th and 29th Severe Local Storms Conferences (2016, 2018)

Program Committee, Workshop on Uncertainty in Radar Retrievals, Model Parameterizations, Assimilated Data and In-Situ Observations: Implications for the Predictability of Weather (2018)

National Weather Center (NWC) Research Experiences for Undergraduates (REU) Selection Committee (2014 – 2017)

Coordinated NSSL 10-year science strategic plan revision (2014)

AWARDS AND HONORS

OAR Outstanding Scientific Paper Award (Warn-on-Forecast team award; 2025)

Department of Commerce Gold Medal Award (Warn-on-Forecast team award; 2024)

2014 Presidential Early Career Award for Scientists and Engineers (PECASE; awarded 2017)

National Research Council Postdoctoral Fellowship (2010-2012)

OU School of Meteorology Outstanding Performance as a Graduate Student Award (2010)

OU College of Atmospheric and Geographic Sciences David James Shellberg Memorial Scholarship (2010)

FORMAL SUPERVISORY ROLES

Graduate Committee Chair: Samuel Varga (M.S., graduated 2024); Chad Wiley (M.S., graduated 2023); Montgomery Flora (Ph.D., graduated 2020; M.S., graduated 2017)

Graduate Committee Co-Chair: Tobias Schmidt (M.S., graduated 2023); Joshua Gebauer (Ph.D., graduated 2020)

Postdoctoral Supervisor: Montgomery Flora (2021 – 2022); William Miller (2019 – 2020); John Lawson (2018 – 2020); Derek Stratman (2016 – 2017)

Postdoctoral Co-supervisor: Nathan Dahl (2017 – 2019)

Graduate Committee member: Amanda Murphy (Ph.D., graduated 2023); Elisa Murillo (M.S., graduated 2018); Thea Sandmael (M.S., graduated 2017); Stefan Rahimi (M.S., graduated 2014)

Graduate Thesis/Dissertation Panelist: Isabelle Greco (M.Phil., graduated 2024); Alejandro Hermoso (Ph.D., graduated 2021)

REU Mentor/Co-Mentor: Brina Lemke (2023), Noah Lang (2022), Nathan Erickson (2021), Elisa Murillo (2015), Montgomery Flora (2014)

PUBLICATIONS

Stratman, D. R., **C. K. Potvin**, P. S. Skinner, and B. M. Lemke, 2025: Storm Displacement Errors in the NSSL Warn-on-Forecast System. *Wea. Forecasting*, https://doi.org/10.1175/WAF-D-24-0248.1, in press.

Flora, M. L., P. Skinner, **C. K. Potvin**, B. Matilla, and A. Reinhart, 2025: Assessing the Impact of Biased Target Variables on Machine Learning Models of Severe Hail. *Wea. Forecasting*, **40**, 1015–1028, https://doi.org/10.1175/WAF-D-24-0051.1.

Flora, M. L., and **C. K. Potvin**, 2025: WoFSCast: A machine learning model for predicting thunderstorms at watch-to-warning scales. *Geophys. Res. Lett.,* **52**, https://doi.org/10.1029/2024GL112383.

Lawson, J. R., J. E. Trujillo-Falcón, D. M. Schultz, M. L. Flora, K. H. Goebbert, S. N. Lyman, **C. K. Potvin**, and A. J. Stepanek, 2025: Pixels and Predictions: Potential of GPT-4V in Meteorological Imagery Analysis and Forecast Communication. *Artif. Intell. Earth Syst.*, **4**, 240029, https://doi.org/10.1175/AIES-D-24-0029.1.

Schmidt, T. G., and Coauthors, 2024: Gridded Severe Hail Nowcasting Using 3D U-Nets, Lightning Observations, and the Warn-on-Forecast System. *Artif. Intell. Earth Syst.*, **3**, 240026, https://doi.org/10.1175/AIES-D-24-0026.1.

Potvin, C. K., M. L. Flora, P. S. Skinner, A. E. Reinhart, and B. C. Matilla, 2024: Using machine learning to predict convection-allowing ensemble forecast skill: Evaluation with the NSSL Warn-on-Forecast System. *Artif. Intell. Earth Syst.*, **3**, e230106.

Flora, M. L., **C. K. Potvin**, A. McGovern, and S. Handler, 2024: A Machine Learning Explainability Tutorial for Atmospheric Sciences. *Artif. Intell. Earth Syst.*, **3**, e230018.

Flora, M. L., B. Gallo, **C. K. Potvin**, A. J. Clark, and K. Wilson, 2024: Exploring the Usefulness of Machine Learning Severe Weather Guidance in the Warn-on-Forecast System: Results from the 2022 NOAA Hazardous Weather Testbed Spring Forecasting Experiment. *Wea. Forecasting*, **39**, 1023–1044.

Clark, A. J., and Coauthors, 2024: Advancing Hazardous Weather Prediction in the 2024 NOAA Hazardous Weather Testbed Spring Forecasting Experiment. *Bull. Amer. Meteor. Soc.*, **105**, E2180–E2183, https://doi.org/10.1175/BAMS-D-24-0249.1.

Chase, R. J., A. McGovern, C. R. Homeyer, P. J. Marinescu, and **C. K. Potvin**, 2024: Machine Learning Estimation of Maximum Vertical Velocity from Radar. *Artif. Intell. Earth Syst*., **3**, 230095.

Lawson, J. R., **C. K. Potvin**, K. Nelson, 2024: Decoding the Atmosphere: Optimising Probabilistic Forecasts with Information Gain. *MDPI Meteorology*, **3**, 212-231.

Britt, K. C., P. S. Skinner, P. L. Heinselman, **C. K. Potvin**, M. L. Flora, B. Matilla, K. H. Knopfmeier, and A. E. Reinhart, 2024: Verification of Quasi-Linear Convective Systems Predicted by the Warn-on-Forecast System (WoFS). *Wea. Forecasting*, **39**, 155–176.

Heinselman, P. L., and Coauthors, 2024: Warn-on-Forecast System: From Vision to Reality. *Wea. Forecasting*, **39**, 75–95.

McGovern, A., R. J. Chase, M. Flora, D. J. Gagne, R. Lagerquist, **C. K. Potvin**, N. Snook, and E. Loken, 2023: A Review of Machine Learning for Convective Weather. *Artif. Intell. Earth Syst.*, **2**, e220077.

Clark, A. J., and Coauthors, 2023: The Third Real-Time, Virtual Spring Forecasting Experiment to Advance Severe Weather Prediction Capabilities. *Bull. Amer. Meteor. Soc.*, **104**, E456–E458.

Brook, J. P., A. Protat, C. K. Potvin, J. S. Soderholm, and H. McGowan, 2023: The Effects of Spatial Interpolation on a Novel, Dual-Doppler 3D Wind Retrieval Technique. *J. Atmos. Oceanic Technol.*, **40**, 1325–1347.

Bunkers, M., and Coauthors, 2023: Advantages to Writing Shorter Articles. *Wea. Forecasting*, **38**, 389–390.

Bunkers, M., and Coauthors, 2023: Comment–Reply Exchanges: Trends and Suggestions. *Wea. Forecasting*, **38**, 633–636.

Potvin, C. K., and Coauthors, 2022: An iterative storm identification and classification algorithm for convection-allowing models and gridded radar analyses. *J. Atmos. Oceanic Technol.*, **39**, 999-1013.

Potvin, C. K., C. Broyles, P. S. Skinner, H. E. Brooks, 2022: Improving estimates of U.S. tornado frequency by accounting for unreported and underrated tornadoes. *J. Appl. Meteor. Climatol.*, **61**, 909-930.

Miller, W., **C. K. Potvin**, M. L. Flora, B. Gallo, L. Wicker, T. Jones, P. Skinner, B. Matilla, and K. Knopfmeier, 2022: Exploring the usefulness of downscaling free forecasts from the Warn-on-Forecast System. *Wea. Forecasting*, **37**, 181-203.

Stratman, D. R., and **C. K. Potvin**, 2022: Testing the Feature Alignment Technique (FAT) in an ensemble-based data assimilation and forecast system with multiple-storm scenarios. *Mon. Wea. Rev.*, **150**, 2033-2054.

Gebauer, J. G., A. Shapiro, **C. K. Potvin**, N. A. Dahl, M. I. Biggerstaff, and A. Alford, 2022: Evaluating vertical velocity retrievals from vertical vorticity constrained dual-Doppler analysis of real, rapid-scan radar data. *J. Atmos. Oceanic Technol.*, **39**, 1591-1610.

Clark, A. J., and Coauthors, 2022: The 2nd real-time, virtual Spring Forecasting Experiment to advance severe weather prediction. *Bull. Amer. Meteor. Soc.*, **103**, E1114-1116.

Clark, A. J., and Coauthors, 2022: The 3rd real-time, virtual Spring Forecasting Experiment to advance severe weather prediction capabilities. *Bull. Amer. Meteor. Soc.*, Early Online Release.

Flora, M. L., **C. K. Potvin**, P. S. Skinner, S. Handler, and A. McGovern, 2021: Using machine learning to generate storm-scale probabilistic guidance of severe weather hazards in the Warn-on-Forecast System. *Mon. Wea. Rev.*, **149**, 1535-1557.

Lawson, J. R., **C. K. Potvin**, P. S. Skinner, and A. E. Reinhart, 2021: The vice and virtue of increased horizontal resolution in ensemble forecasts of tornadic thunderstorms in low-CAPE, high-shear environments. *Mon. Wea. Rev.*, **149**, 921-944.

Shapiro, A., J. G. Gebauer, N. A. Dahl, D. J. Bodine, A. Mahre, and **C. K. Potvin**, 2021: Spatially variable advection correction of Doppler radial velocity data. *J. Atmos. Sci.*, **78**, 167-188.

Potvin, C. K., P. S. Skinner, K. A. Hoogewind, M. C. Coniglio, J. A. Gibbs, A. J. Clark, M. L. Flora, A. E. Reinhart, J. R. Carley, and E. N. Smith, 2020: Assessing systematic impacts of PBL schemes on storm evolution in the NOAA Warn-on-Forecast System. *Mon. Wea. Rev.*, **148**, 2567-2590.

Homeyer, C. R., T. N. Sandmael, **C. K. Potvin**, and A. Murphy, 2020: Distinguishing characteristics of tornadic and nontornadic supercell storms from composite mean analyses of radar observations. *Mon. Wea. Rev.*, **148**, 5015-5040.

Jackson, R., S. Collis, T. Lang, **C. K. Potvin**, and T. Munson, 2020: PyDDA: A Pythonic direct data assimilation framework for wind retrievals. *Journal of the Operational Research Society*, **8.**

Lawson, J. R., Gallus, W. A., and **C. K. Potvin**, 2020: Sensitivity of a bowing mesoscale convective system to horizontal grid spacing in a convection-allowing ensemble. *Atmosphere*, **11**.

Potvin, C. K., J. R. Carley, A. Clark, L. J. Wicker, P. S. Skinner, A. E. Reinhart, B. T. Gallo, J. S. Kain, G. Romine, E. Aligo, K. A. Brewster, D. C. Dowell, L. M. Harris, I. L. Jirak, F. Kong, T. A. Supinie, K. W. Thomas, X. Wang, Y. Wang, and M. Xue, 2019: Systematic comparison of convection-allowing models during the 2017 NOAA HWT Spring Forecasting Experiment. *Wea. Forecasting*, **34**, 1395-1416.

Potvin, C. K., C. Broyles, P. S. Skinner, H. E. Brooks, and E. Rasmussen, 2019: A Bayesian hierarchical modeling framework for correcting reporting bias in the U.S. tornado database. *Wea. Forecasting*, **34**, 15-30.

Dahl, N. A., A. Shapiro, **C. K. Potvin**, A. Theisen, J. G. Gebauer, A. D. Schenkman, and M. Xue, 2019: High-resolution, rapid-scan dual-Doppler retrievals of vertical velocity in a simulated supercell. *J. Atmos. Oceanic Technol*., **36**, 1477–1500.

Flora, M. L., P. S. Skinner, **C. K. Potvin,** A. E. Reinhart, T. A. Jones, N. Yussouf, and K H. Knopfmeier, 2019: Object-based verification of short-term, storm-scale probabilistic mesocyclone guidance from an experimental Warn-on-Forecast system. *Wea. Forecasting*, **34**, 1721-1739.

Flora, M. L., **C. K. Potvin**, and L. J. Wicker, 2018: Supercell predictability: Exploring ensemble forecast sensitivity to initial condition spread. *Mon. Wea. Rev.*, **146**, 2361-2379.

Stratman, D. R., **C. K. Potvin**, and L. J. Wicker, 2018: Correcting storm displacement errors in ensembles using the Feature Alignment Technique (FAT). *Mon. Wea. Rev.*, **146**, 2125-2145.

Wienhoff, Z. B., H. B. Bluestein, L. J. Wicker, J. C. Snyder, A. Shapiro, **C. K. Potvin**, J. B. Houser, and D. W. Reif, 2018: Applications of a spatially variable advection correction technique for temporal correction of dual-Doppler analyses of tornadic supercells. *Mon. Wea. Rev.*, **146**, 2949-2971.

Belik, Pavel, B. Dahl, D. Dokken, **C. K. Potvin**, K. Scholz, and Mikhail Shvartsman, 2018: Possible implications of self-similarity for tornadogenesis and maintenance. *AIMS Mathematics*, **3**, 365-390.

Potvin, C. K., E. M. Murillo, M. L. Flora, and D. M. Wheatley, 2017: Sensitivity of supercell simulations to initial-condition resolution. *J. Atmos. Sci.*, **74**, 5-26.

McGovern, A., **C. K. Potvin**, and R. A. Brown, 2017: Using large-scale machine learning to improve our understanding of the formation of tornadoes. *Large-scale Machine Learning in the Earth* Sciences, A. N. Srivastava, R. Nemani, K. Steinhaeuser, Eds., CRC Press, 95–112.

North, K. W., M. Oue, P. Kollias, S. E. Giangrande, S. M. Collis, and **C. K. Potvin**, 2017: Vertical air motion retrievals in deep convective clouds using the ARM scanning radar network in Oklahoma during MC3E. *Atmos. Meas. Tech.*, **10**, 2785-2806.

Dokken, D., P. Belik, **C. K. Potvin**, K. Scholz, and M. Shvartsman, 2017: Applications of vortex gas models to tornadogenesis and maintenance. *Open Journal of Fluid Dynamics,* **7**, 596-622.

DiGangi, E. A., D. R. MacGorman, C. L. Ziegler, D. Betten, M. Biggerstaff, M. Bowlan, and **C. K. Potvin**, 2016: An overview of the 29 May 2012 Kingfisher supercell during DC3: Observations of the 29 May 2012 DC3 case. *J. Geo. Res.*, **121**, 14316-14343.

Potvin, C. K., and M. L. Flora, 2015: Sensitivity of idealized supercell simulations to horizontal grid spacing: Implications for Warn-On-Forecast. *Mon. Wea. Rev.*, **143,** 2998-3024.

Thompson, T. E., L. J. Wicker, X. Wang, and **C. K. Potvin**, 2015: A comparison between the local ensemble transform Kalman filter and the ensemble square root filter for the assimilation of radar data in convective-scale models. *Quart. J. Roy. Meteor. Soc*., **141,** 1163-1176.

Skinner, P. S., C. C. Weiss, L. J. Wicker, **C. K. Potvin**, and D. C. Dowell, 2015: Forcing mechanisms for an internal rear-flank downdraft momentum surge in the 18 May 2010 Dumas, Texas supercell. *Mon. Wea. Rev.*, **143**, 4305-4330.

Shapiro, A., S. Rahimi, **C. K. Potvin**, and L. Orf, 2015: On the use of advection correction in trajectory calculations. *J. Atmos. Sci.*, **72**, 4261-4280.

Potvin, C. K., 2013: A variational method for detecting and characterizing intense vortices in Cartesian wind fields. *Mon. Wea. Rev.*, **141**, 3102-3115.

Potvin, C. K., and L. J. Wicker, 2013a: Correcting fast-mode pressure errors in storm-scale ensemble Kalman filter analyses. *Advances in Meteorology*, **2013**, 1-14.

Potvin, C. K., and L. J. Wicker, 2013b: Assessing ensemble forecasts of low-level supercell rotation within an OSSE framework. *Wea. and Forecasting*, **28**, 940-960.

Potvin, C. K., L. J. Wicker, D. Betten, M. I. Biggerstaff, and A. Shapiro, 2013: Comparison between dual-Doppler and EnKF storm-scale wind analyses: The 29-30 May 2004 Geary, Oklahoma, supercell thunderstorm. *Mon. Wea. Rev.*, **141**, 1612-1628.

Lakshmanan, V., K. Hondl, **C. K. Potvin**, and D. Preignitz, 2013: An improved method to compute radar echo top heights. *Wea. and Forecasting*, **28**, 481-488.

Stensrud, D. J., L. J. Wicker, M. Xue, D. T. Dawson II, N. Yussouf, D. M. Wheatley, T. E. Thompson, N. A. Snook, T. M. Smith, A. D. Schenkman, **C. K. Potvin**, E. R. Mansell, T. Lei, K. M. Kuhlman, Y. Jung, T. A. Jones, J. Gao, M. C. Coniglio, H. E. Brooks, and K. A. Brewster, 2013: Progress and challenges with Warn-on-Forecast. *Atmos. Res*., **123**, 2-16.

Potvin, C. K., and L. J. Wicker, 2012: Comparison between dual-Doppler and EnKF storm-scale wind analyses: Observing system simulation experiments with a supercell thunderstorm. *Mon. Wea. Rev.*, **140**, 3972-3991.

Potvin, C. K., D. Betten, L. J. Wicker, K. L. Elmore, and M. I. Biggerstaff, 2012a: 3DVAR vs. traditional dual-Doppler wind retrievals of a simulated supercell thunderstorm. *Mon. Wea. Rev.*, **140**, 3487-3494.

Potvin, C. K., L. J. Wicker, and A. Shapiro, 2012b: Assessing errors in variational dual-Doppler wind syntheses of supercell thunderstorms observed by storm-scale mobile radars. *J. Atmos. Oceanic Technol.*, **29**, 1009-1025.

Potvin, C. K., A. Shapiro, and M. Xue, 2012c: Impact of a vertical vorticity constraint in variational dual-Doppler wind analysis: Tests with real and simulated supercell data. *J. Atmos. Oceanic Technol.*, **29**, 32-49.

Potvin, C. K., A. Shapiro, M. I. Biggerstaff, and Joshua M. Wurman, 2011: The VDAC technique: A variational method for detecting and characterizing convective vortices in multiple-Doppler radar data. *Mon. Wea. Rev.*, **139**, 2593–2613.

Shapiro, A., K. M. Willingham, and **C. K. Potvin**, 2010: Spatially variable advection correction of radar data. Part I: Theoretical considerations. *J. Atmos. Sci.*, **67**, 3445–3456.

Shapiro, A., K. M. Willingham, and **C. K. Potvin**, 2010: Spatially variable advection correction of radar data. Part II: Test results. *J. Atmos. Sci.*, **67**, 3457–3470.

Potvin, C. K., K. L. Elmore, and S. J. Weiss, 2010: Assessing the impacts of proximity sounding criteria on the climatology of significant tornado environments. *Wea. Forecasting*., **25**, 921–930.

Shapiro, A., **C. K. Potvin**, and J. Gao, 2009: Use of a vertical vorticity equation in variational dual-Doppler wind analysis. *J. Atmos. Oceanic Technol.*, **26**, 2089–2106.

Potvin, C. K., A. Shapiro, T.-Y. Yu, J. Gao, and M. Xue, 2009: Using a low-order model to detect and characterize tornadoes in multiple-Doppler radar data. *Mon. Wea. Rev.*, **137**, 1230-1249.