

Curtis Walker

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Education:

- 2018 Ph.D. Earth and Atmospheric Sciences; University of Nebraska-Lincoln
Dissertation: “Road Weather Impact Based Decision Support
Applications: Developing a Department of Transportation Winter Severity Index”
- 2014 M.S. Earth and Atmospheric Sciences; University of Nebraska-Lincoln
Thesis: “Cloud Impacts on Pavement Temperature and Shortwave Radiation”
- 2012 B.S. Meteorology (Summa Cum Laude); State University of New York (SUNY), College at Oneonta

Professional Experience:

- 2020–present: Project Scientist I, Research Applications Laboratory, National Center for Atmospheric Research; Boulder, Colorado
- 2018–2020: Postdoctoral Fellow, Advanced Study Program, National Center for Atmospheric Research; Boulder, Colorado
- 2019: Adjunct Instructor, Department of Earth and Atmospheric Sciences, University of Northern Colorado; Greeley, Colorado
- 2019: Weather Operations Intern, Division of Maintenance and Operations, Colorado Department of Transportation; Denver, Colorado
- 2016–2018: Adjunct Instructor, Department of Environmental and Earth Sciences, Doane University; Crete, Nebraska
- 2012–2018: Graduate Research Assistant, Department of Earth and Atmospheric Sciences, University of Nebraska-Lincoln; Lincoln, Nebraska
- 2016–2017: Instructor, Department of Earth and Atmospheric Sciences; University of Nebraska-Lincoln; Lincoln, Nebraska
- 2014–2015: Meteorologist, Perfect Storm; Boulder, Colorado
- 2013: Research Intern, National Center for Atmospheric Research – Research Applications Laboratory; Boulder, Colorado
- 2010–2013: Significant Opportunities in Atmospheric Research and Science (SOARS) Intern, University Corporation for Atmospheric Research; Boulder, Colorado
- 2009–2012: Academic Team Member, SUNY College at Oneonta; Oneonta, New York

Research Publications (peer-reviewed):

1. Siems-Anderson, A. R., **C. L. Walker** (corresponding author), G. Wiener, W. P. Mahoney III, and S. E. Haupt, 2019: An Adaptive Big Data Weather System for Surface Transportation. *Transportation Research Interdisciplinary Perspectives*, **3**, doi: 10.1016/j.trip.2019.100071.

Research Publications (peer-reviewed cont.):

2. **Walker, C. L.**, D. Steinkruger, P. Gholizadeh, S. Hasanzadeh, M. R. Anderson, and B. Esmaili, 2019: Developing a Department of Transportation Winter Severity Index. *Journal of Applied Meteorology and Climatology*, **58 (8)**, 1779–1798, doi: 10.1175/JAMC-D-18-0240.1.
3. Gholizadeh, P., **C. L. Walker**, M. R. Anderson, and B. Esmaili, 2019: Application of Unsupervised Machine Learning to Increase Safety and Mobility on Roadways after Snowstorms. *2019 ASCE International Conference on Computing in Civil Engineering*, doi: 10.1061/9780784482445.045.
4. Dao, B., S. Hasanzadeh, **C. L. Walker** (corresponding author), D. Steinkruger, B. Esmaili, and M. R. Anderson, 2019: Current practices of winter maintenance operations and perceptions of winter weather conditions. *Cold Regions Engineering*, **33 (3)**, doi: 10.1061/(ASCE)CR.1943-5495.0000191.
5. **Walker, C. L.**, S. Hasanzadeh, B. Esmaili, M. R. Anderson, and B. Dao, 2019: Developing A Winter Severity Index: A Critical Review. *Cold Regions Science and Technology*, **160**, 139–149, doi: 10.1016/j.coldregions.2019.02.005.
6. **Walker, C. L.**, and M. R. Anderson, 2016: Cloud impacts on pavement temperature and shortwave radiation. *Journal of Applied Meteorology and Climatology*, **55**, 2329–2347, doi: 10.1175/JAMC-D-16-0094.1.
7. Creighton, T. T., **C. L. Walker**, and M. R. Anderson, 2014: Coverage of Black versus White Males in Local Television News Lead Stories. *Journal of Mass Communication and Journalism*, **4**, doi: 10.4172/2165-7912.1000216.
8. **Walker, C. L.**, E. Potter, N. Esposito, and M. Godek, 2012: An Assessment of the Relationship between Air Mass Frequency and Extreme Drought in the Midwest United States. *The Compass: Earth Science Journal of Sigma Gamma Epsilon*, **84**, Available at: <http://digitalcommons.csbsju.edu/compass/vol84/iss2/5>.

Research Publications (in review):

9. **Walker, C. L.**, B. Boyce, C. Albrecht, and A. Siems-Anderson, 2020: Will Weather Dampen Self-Driving Vehicles? *Bulletin of the American Meteorological Society*, in press.

Research Publications (in prep):

10. **Walker, C. L.**, and A. W. Black, 2020: Geographic Information Systems for Decision Support and Driver Awareness of Road Weather Hazards. *Journal of Transport Geography*, in prep.
11. **Walker, C. L.**, and A. W. Black, 2020: United States Railroad Network Exposure to Weather and Climate Impacts. *Journal of Transport Geography*, in prep.

Non-Refereed Publications:

12. Anderson, M. R., **C. L. Walker**, N. Barnhardt, N. Rick, and C. Wunderlin, 2020: Correlation Analysis of MDSS and NEWINS. Nebraska Department of Transportation Report No. M081. Available online at https://dot.nebraska.gov/media/113479/final_report-spr_p1-19-m081.pdf.
13. **Walker, C. L.**, M. R. Anderson, and B. Esmaili, 2018: Development of the Nebraska Department of Transportation Winter Severity Index. Nebraska Department of Transportation Report No. M054. Available online at <https://dot.nebraska.gov/media/12698/final-report-m054.pdf>.

Research Presentations (given):

Machine Learning to Predict Vehicular Crash Severity from Weather Conditions, (2020), Curtis Walker, Sue Ellen Haupt, Tyler McCandless, and Amanda Siems-Anderson, Annual Meeting of the American Association of Geographers, Denver, Colorado, [virtual due to COVID19]

Machine Learning to Predict Vehicular Crash Severity from Weather Conditions, (2020), Curtis Walker, Sue Ellen Haupt, Tyler McCandless, and Amanda Siems-Anderson, American Meteorological Society 100th Annual Meeting, 36th Conference on Environmental Information Processing Technologies (EIPT – formerly IIPS), Boston, Massachusetts, [oral]

Development of a Department of Transportation Winter Severity Index, (2019), Curtis Walker, Dylan Steinkruger, Mark Anderson, Sue Ellen Haupt, Amanda Siems-Anderson, Pouya Gholizadeh, Sogand Hasanzadeh, Behzad Esmaili, and Bac Dao, American Meteorological Society 99th Annual Meeting, 35th Conference on Environmental Information Processing Technologies (EIPT – formerly IIPS), Phoenix, Arizona, [oral]

Development of the Nebraska Department of Transportation Winter Severity Index, (2018), Curtis Walker, 20th Annual High Plains Conference, American Meteorological Society, National Weather Association, Hastings, Nebraska, [oral]

Developing a Winter Severity Index to Improve Safety and Mobility, (2018), Curtis Walker, Dylan Steinkruger, Pouya Gholizadeh, Bac Dao, Sogand Hasanzadeh, Mark Anderson, and Behzad Esmaili, American Meteorological Society 98th Annual Meeting, 34th Conference on Environmental Information Processing Technologies (EIPT – formerly IIPS), Austin, Texas, [oral]

Measuring Winter Maintenance Operations Performance, (2017), Bac Dao, Curtis Walker, Sogand Hasanzadeh, Dylan Steinkruger, Behzad Esmaili and Mark R. Anderson, Mid-Content Transportation Research Symposium, Ames, Iowa, [poster]

Developing a Winter Severity Index to Improve Safety and Mobility, (2017), Curtis Walker, Bac Dao, Sogand Hasanzadeh, Mark Anderson, and Behzad Esmaili, American Meteorological Society 97th Annual Meeting, 33rd Conference on Environmental Information Processing Technologies (EIPT – formerly IIPS), Seattle, Washington, [oral]

Research Presentations (cont.):

- Cloud Impacts on Road Pavement Temperature and Mobile Vehicle Observations*, (2016), Curtis Walker and Mark Anderson, American Meteorological Society 96th Annual Meeting, 32nd Conference on Environmental Information Processing Technologies (EIPT – formerly IIPS), New Orleans, Louisiana, [oral]
- Cloud Impacts on Road Pavement Temperature and Surface Radiation*, (2015), Curtis Walker and Mark R. Anderson Intelligent Transportation Society 22nd World Congress, Bordeaux, France, [oral]
- Cloud Impacts on Pavement Temperature in Energy Balance Models*, (2015), Curtis Walker, Mark R. Anderson, Jun Wang, and Clinton Rowe, American Meteorological Society 95th Annual Meeting, 31st Conference on Environmental Information Processing Technologies (EIPT – formerly IIPS), Phoenix, Arizona, [oral]
- Cloud Impacts on Pavement Temperature in Energy Balance Models*, (2014), Curtis Walker, Mark R. Anderson, Jun Wang, and Clinton Rowe, Intelligent Transportation Society 21st World Congress, Detroit, Michigan, [oral]
- Cloud Impacts on Pavement Temperature in Energy Balance Models*, (2014), Curtis Walker, Mark R. Anderson, Jun Wang, and Clinton Rowe, American Meteorological Society 94th Annual Meeting, 30th Conference on Environmental Information Processing Technologies (EIPT – formerly IIPS), Atlanta, Georgia, [oral]
- The Impact of Cloud Type on Surface Radiation and Road Pavement Temperature*, (2013), Curtis Walker, Amanda Anderson, Michael Chapman, and Sheldon Drobot, American Meteorological Society 93rd Annual Meeting, 29th Conference on Environmental Information Processing Technologies (formerly IIPS), Austin, Texas, [oral]
- The Impact of Cloud Type on Surface Radiation and Road Pavement Temperature*, (2012), Curtis Walker, Amanda Anderson, Michael Chapman, and Sheldon Drobot, American Geophysical Union Annual Meeting, San Francisco, California, [poster]
- An Analysis of the Sensitivity of Pavement Temperature to the Makeup of the Road*, (2012), Curtis Walker, Michael Chapman, and Sheldon Drobot, Annual Meeting of the Association of American Geographers, New York, New York, [oral]
- An Analysis of the Sensitivity of Pavement Temperature to the Makeup of the Road*, (2012), Curtis Walker, Michael Chapman, and Sheldon Drobot, American Meteorological Society 11th Annual Student Conference, New Orleans, Louisiana, [poster]
- The Relationship Between Air Mass Frequency and Extreme Drought in the Midwest United States from 2000-2010*, (2011), Curtis Walker, Erin Potter, Nicholas Esposito and Melissa Godek, American Geophysical Union Annual Meeting, San Francisco, California, [poster]
- Intelligent Transportation Systems to Mitigate Impacts of Adverse Weather Conditions*, (2011), Curtis Walker and Michael Chapman, Intelligent Transportation Society 18th World Congress, Orlando, Florida, [poster]

Research Presentations (cont.):

Image Processing Algorithms to Remove Aerosols from Solar Coronal Images, (2010), Curtis Walker, Scott Sewell, and Steve Tomczyk, Center for Multi-Scale Modeling of Atmospheric Processes, Colorado State University, Fort Collins, Colorado, [poster]

Invited Presentations:

Surface Transportation Meteorology Department of Transportation Weather Decision Support, (2019), Denver Boulder Chapter of the American Meteorological Society, Boulder, Colorado, [oral]

Surface Transportation Meteorology: Weather Decision Support, (2019), University of Northern Colorado, Greeley, Colorado, [oral]

Nebraska Winter Weather Decision Support, (2018), Nebraska Department of Transportation 2018 Annual Operations and Maintenance Conference, Kearney, Nebraska, [oral]

Developing the Nebraska Department of Transportation Winter Severity Index (NEWINS) to Improve Safety and Mobility, (2018), Department of Atmospheric and Environmental Sciences / Atmospheric Science Research Center Joint Colloquium Series, State University of New York, University at Albany, Albany, New York, [oral]

Winter Weather Severity Index, (2017), Nebraska Department of Transportation 2017 Annual Operations and Maintenance Conference, Kearney, Nebraska, [oral]

Road Weather Impact-Based Decision Support Applications, (2017), The Doane University Kappa Chapter of the Kappa Alpha Omicron National Environmental Science and Studies Honor Society 3rd Annual Induction Ceremony, Crete, Nebraska, [oral]

Road Weather and Transportation Hazards, (2016), Significant Opportunities in Atmospheric Research and Science (SOARS) Program 20th Anniversary Research Symposium, Boulder, Colorado, [poster]

Anticipating Meteorology in 2040: A Student Perspective, (2015), American Meteorological Society 95th Annual Meeting, Keynote Presidential Forum, Phoenix, Arizona, [oral]
<https://ams.confex.com/ams/95Annual/webprogram/Session38326.html>

Road Weather and Transportation Hazards, (2012), National Center for Atmospheric Research Science Day at the National Science Foundation, Washington, D.C., [poster]

Proposals (submitted):

Project/Proposal Title: Developing 21st Century Approaches for Land Cover Change Data Visualization and Dissemination

Source of Support: United States Geological Survey
 Total Award Amount: \$245,506
 Period of Performance: 2020–2021
 Personnel: J. Boehnert (PI), A. Dumont (Co-PI), K. Sampson (Co-PI), **C. L. Walker (Co-PI)**, O. Wilhelmi (Co-PI)
 Status: In Review

Project/Proposal Title: Roadway Friction Modeling

Source of Support: Iowa State University Institute for Transportation Aurora Program & Iowa Department of Transportation
 Total Award Amount: \$166,008
 Period of Performance: 2020–2021
 Personnel: L. Fay (PI), G. Wiener (Co-PI), **C. L. Walker (Co-PI)**
 Status: In Review

Project/Proposal Title: Ongoing Issues with Winter Severity Indices

Source of Support: Iowa State University Institute for Transportation Aurora Program & Iowa Department of Transportation
 Total Award Amount: \$40,016
 Period of Performance: 2020–2021
 Personnel: L. Fay (PI), G. Wiener (Co-PI), **C. L. Walker (Co-PI)**, S. Landolt (Co-I)
 Status: Funded, In Progress

Fellowships:

2018: National Center for Atmospheric Research Advanced Study Program Postdoctoral Fellowship
 2013: National Science Foundation Graduate Research Fellowship (\$136,000)
 2012: American Meteorological Society Graduate Fellowship (\$28,000)

Awards:

2016: Nick Wiltgen Memorial Scholarship Award
 2015: 3rd Place Outstanding Oral Award, AMS 95th Annual Meeting
 2012: Philo C. Wilson Outstanding Senior Award
 2012: State University of New York Chancellor's Award for Student Excellence
 2012: 2nd Place Undergraduate Poster, AMS 11th Annual Student Conference
 2011: AGU Namias Travel Grant
 2011: 2nd Place Student Essay Contest, Intelligent Transportation Society of America
 2010: Robert F. Caputo '84 Scholarship
 2009: Philo C. Wilson Book Award
 2008: Presidential Scholarship Award

Professional Organizations:

Association of American Geographers (AAG)
 American Geophysical Union (AGU)
 American Meteorological Society (AMS)
 American Society of Civil Engineers (ASCE)
 Intelligent Transportation Society of America (ITSA)

Professional Service:

2019–present: American Society of Civil Engineers, Cold Regions Engineering Division, Transportation and Infrastructure Committee
 2018–present: Advisory Board, Southern Plains Transportation Center, University of Oklahoma
 2012–present: American Meteorological Society Intelligent Transportation Systems/Surface Transportation (ITS/ST) Committee
 2012–present: American Meteorological Society Intelligent Transportation Systems/Surface Transportation (ITS/ST) Mobile Observations Subcommittee
 2020: Reviewer, American Association for the Advancement of Science Journal: Science Advances
 2019: Strategic Plan Steering Committee, Directorate and Executive Committee, National Center for Atmospheric Research
 2019: Reviewer, Transportation Research Record: Journal of the Transportation Research Board (TRR Journal)
 2019: Proposal Review Panel, National Science Foundation
 2018–2020: Professional Development Committee, Advanced Study Program, Fellows Association, National Center for Atmospheric Research
 2018: Director Search Committee, Early Career Scientist Assembly, National Center for Atmospheric Research

University Service:

2016–2018: University of Nebraska-Lincoln Representative, City of Lincoln Internal Liquor Committee; Lincoln, Nebraska
 2016–2017: Advisor, Graduate Student Assembly, University of Nebraska-Lincoln
 2016–2017: Instructor, Department of Earth and Atmospheric Sciences; University of Nebraska-Lincoln
 2016: Executive Vice Chancellor for Academic Affairs / Provost Search Committee, University of Nebraska-Lincoln
 2014–2016: Senator, Association of Students of the University of Nebraska, University of Nebraska-Lincoln
 2014–2016: President, Graduate Student Assembly, University of Nebraska-Lincoln
 2014–2016: Academic Planning Committee, University of Nebraska-Lincoln
 2014–2016: Graduate Council, University of Nebraska-Lincoln
 2013–2014: Social Committee Chair, Graduate Student Association, University of Nebraska-Lincoln
 2011–2012: Earth Science Student Advisory Council, SUNY College at Oneonta

Specialized Training:

- 2019: Media Training for Scientists, University Corporation for Atmospheric Research, Boulder, Colorado
- 2018: Weather Research and Forecasting (WRF) Model Tutorial, National Center for Atmospheric Research, Boulder, Colorado
- 2018: Grant Development National Science Foundation & Department of Defense Workshop, Grant Training Center, University Corporation for Atmospheric Research, Boulder, Colorado
- 2018: Write Winning Grant Proposals, Grant Writers' Seminars and Workshops, University of Nebraska-Lincoln, Lincoln, Nebraska
- 2017: Nebraska Integrated Warning Team (IWT) Workshop, University of Nebraska-Lincoln, Lincoln, Nebraska
- 2016: Nebraska Integrated Weather Team (IWT) Workshop, Buffalo County Extension, Kearney, Nebraska
- 2015: Expert Witness Training Academy (EWTA), Mitchell Hamline School of Law; St. Paul, Minnesota

Research Interests:

Road Weather / Surface Transportation Meteorology
Weather Impacts and Risk Communication / Mitigation
Mesoscale and Convective Societal / Transportation Hazards
Climate Risk Assessment
Intelligent Transportation / Connected and Autonomous Vehicle Systems
Boundary Layer Meteorology
Land Surface-Atmosphere Interactions
Remote Sensing of Surface Energy Balance

Courses Taught:

Introduction to Meteorology (Doane)
Introduction to Meteorology Laboratory (Doane)
Physical Geography (Doane)
Our Violent Atmosphere (UNCO)
Weather and Climate (UNL)

Teaching Load:

2016-2018: 14 semester hours per year
2019: 3 semester hours

Technical Skills:

ArcGIS 10.X
Adobe Creative Cloud Suite
Banner (Student Database / Advising)
Interactive Data Language (IDL)
Linux Environment / UNIX commands
Machine Learning Algorithms
MATLAB

Microsoft Office
NCAR Command Language (NCL)
NLOGIT
Python
Statistical Analysis Software (SAS)
R Statistical Programming Language