Amanda Siems-Anderson

Associate Scientist IV

Weather Systems Assessment Program | Research Applications Laboratory

National Center for Atmospheric Research

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Research Areas Technical Skills Tools

Road Weather Project Management R

Decision Support Systems Road Weather Research & Outreach Model Evaluation Tools

Weather Prediction Verification Statistical Verification Unix

Education

**Master of Science, Atmospheric Science** August 2011

Colorado State University, Fort Collins, CO

* GPA: 3.9/4.0
* Thesis: A Comparison of Positive and Negative Cloud-to-Gound Lightning Dominant Storms in Three Regions of the United States

**Bachelor of Science, *summa cum laude* Meteorology** May 2007

Valparaiso University, Valparaiso, IN

* Minor: Mathematics
* GPA: 3.9/4.0, Major GPA: 4.0/4.0

Experience

**Associate Scientist IV**

*National Center for Atmospheric Research* July 2020 – present

* Science lead for NCAR’s Surface Transportation program
* Principal Investigator of NCAR team for the Wyoming Connected Vehicle Pilot Deployment
* PI or Co-PI for multiple projects from sponsors including U.S. Department of Transportation, U.S. Department of Energy, Booz Allen Hamilton, state Departments of Transportation, and the National Oceanic and Atmospheric Administration
* Expertise with road weather research, decision support, stakeholder engagement, Connected and Automated Vehicles (CAVs)
* Experience with numerical weather prediction verification for diverse projects including road weather, wildland fire, machine learning applications, renewable energy, precipitation, severe convective weather, and hydrology
* Interviewee for press releases and articles about projects
* Led to sponsor reports and peer-reviewed publications
* Managed projects totaling approximately $650,000
* Supervisory position

**Associate Scientist III**

*National Center for Atmospheric Research* July 2013 – July 2020

* Science lead for NCAR’s Surface Transportation program
* PI for projects sponsored by U.S. Department of Transportation
* Assessment team lead for the Colorado Fire Prediction System (CO-FPS)
* Presented research results to scientific audiences, stakeholders, and media
* Led sponsor reports and peer-reviewed publications
* Managed projects totaling approximately $920,000
* Supervisory position

**Associate Scientist II**

*National Center for Atmospheric Research* October 2009 – July 2013

* Developed road weather hazard algorithms for the Pikalert® system, a road weather condition and maintenance assessment and prediction system
* Assisted in development and tuning of the AutoNowCaster, a thunderstorm nowcasting system running operationally in the National Oceanic and Atmospheric Administration
* Performed statistical analyses and verification of atmospheric observations and numerical weather predictions
* Presented research to scientific audiences and stakeholders
* Contributed to sponsor reports and peer-reviewed publications

**Graduate Research Assistant**

*Colorado State University* August 2007 – October 2009

* Analyzed total lightning characteristics of storms in three regions alongside their environment and microphysics
* Used a framework to objectively assign lightning to environmental data
* Processed radar data using SOLO-II, REORDER, CEDRIC, and DROPS hydrometeor identification
* Quality controlled and processed total lightning data using XLMA

Field Work

Demonstration of CAN-bus Study September – December 2011

Boulder, Colorado

* Set test objectives
* Assisted in equipment set up and drove test vehicle
* Led post-demonstration analysis

2010 Detroit Test Environment Experiment January – March 2010

Novi, Michigan

* Supported forecasting and assisted in equipment set up and vehicle data quality control
* Created scripts on the fly for in-field data processing and quick look plots
* Participated in post-demonstration analysis

Southwest Monsoon Experiment/Terrain-influenced Monsoon Rainfall Experiment May – June 2008

Pingtung, Taiwan

* Student assistant monitoring weather and learning about radar field work
* Set radar scanning strategies

Media and Outreach

* Principal Investigator Interview, “AV Weather”, *Meteorological Technology International*, September 2022, https://www.ukimediaevents.com/publication/d5e1bc6f/44
* Subject Matter Expert Interview, “How Connected Cars Can Map Urban Heat Islands”, *Scientific American*, 1 July 2022, https://www.scientificamerican.com/article/how-connected-cars-can-map-urban-heat-islands/
* Feature, “NCAR to investigate impact of weather conditions on autonomous electric vehicles”, *Autonomous Vehicle International*, 25 February 2022, https://www.autonomousvehicleinternational.com/news/testing/ncar-to-investigate-impact-of-weather-conditions-on-autonomous-electric-vehicles.html
* Press Release, “Favorable Weather For Self-Driving Vehicles”, *NCAR Press Release*, 23 February 2022, https://news.ucar.edu/132828/favorable-weather-self-driving-vehicles
* Subject Matter Expert Interview, “Weather-Savvy Roads: The Power of Integrating Mobile Observations”, *Federal Highway Administration*, 19 September 2018, https://youtu.be/ABPtWSwnv34
* Press Release, “Where the Rubber Meets the Road – NCAR Technology Put to the Test on Treacherous Winter Roads”, *NCAR Press Release*, 28 March 2017, https://ral.ucar.edu/pressroom/features/where-the-rubber-meets-the-road

Awards and Accomplishments

* Graduate of UCAR Leadership Exploration And Development (LEAD) course, 2022
* HPC User Forum Innovation Excellence Award, 2022
* Nominee, UCAR Mentoring Award, 2020
* Best paper award, PIARC conference, Gdańsk, Poland, 2018
* Co-inventor of the Pikalert® system, patent number 9401089
* Second place, ATCA Journal Award, 2016
* Nominee, UCAR Scientific and/or Technical Advancement Award, 2016

Affiliations and Activities

* American Meteorological Society (AMS) member
* Snow and Ice Pooled Fund Cooperative Program (SICOP) committee [AMS Liaison]
* Ex-Officio, AMS Board on Enterprise Economic Development (BEED)
* AMS ITS/Surface Transportation Committee [Chair], Mobile Observations subcommittee [Chair]
* Organized “Self-driving and Automated Vehicles – Role of Public and Private Sector” panel discussion at the 2022 AMS Washington Forum
* Organized “Bridging the Gap between the Weather and Transportation Communities through Public, Private, and Academic Collaborations” panel discussion at the 2021 AMS Summer Community meeting
* Co-chair, 36th, 37th, 38th, and 39th Conferences on Environmental Information Processing Technologies, American Meteorological Society, Weather and Roads Sessions
* World Meteorological Organization HIWeather Evaluation Task Team member
* Reviewer: J. Appl. Meteor. Clim., Mod. Traf. Transp. Eng. Res., J. Cold Regions Eng., Adv. Trans., Meteor. Applications, Bull. Amer. Meteor. Soc., DOE Proposals
* Research and computing mentor for five Significant Opportunities in Atmospheric Research and Science (SOARS) protégés
* Outside committee member for one Masters candidate, mentor for two PhD candidates

Funded Projects

* Principal Investigator, Integrating Fire Weather Forecast System Verification into METplus – Sponsored by NOAA: $299,789
* Principal Investigator, ITS JPO – Sponsored by Booz Allen Hamilton: IDIQ
* Principal Investigator, Pikalert® for WYDOT – Mod 1 – Sponsored by the Wyoming Department of Transportation: $299,874
* Principal Investigator, Wyoming Department of Transportation Connected Vehicle Pilot – Sponsored by the United States Department of Transportation: $369,628
* Project Lead, Utilization of Vehicle Probe Data To Support Road Weather Hazard Diagnosis & Prediction – Sponsored by the Federal Highway Administration: $399,996

Publications

* **Siems-Anderson, A.**, C. Walker, P. Kadav, Z. Asher, 2023: Automated, Electric Vehicle Operations During Adverse Weather Conditions. World Road Congress, PIARC, In review.
* Kadav, P., N. A. Goberville, K. Prins, **A. Siems-Anderson**, C. Walker, F. Motallebiaraghi, K. Carrow, J. Fanas Rojas, G. Y. Hong, Z. Asher, 2023: Road Snow Coverage Estimation Using Camera and Weather Infrastructure Sensor Inputs. *SAE International Technical Papers*, 2023-01-0057.
* Goberville, N.A., C. L. Walker, **A. R. Siems-Anderson**, Z. D. Asher, 2023: Snow Coverage Estimation Using Camera Data for Automated Driving Applications. *Trans. Res. Interdisciplinary Perspectives*, **18**, 100766.
* Kosović, B. T. W. Juliano, A. DeCastro, M. Frediani, **A. Siems-Anderson**, P. Jimenez, D. Muñoz-Esparza, J. C. Knievel, M. Eghdami, 2022: Wildfires and weather. *Extreme Weather Forecasting*, M. Astitha, E. Nikolopoulos, Ed., Elsevier.
* DeCastro, A., **A. Siems-Anderson**, E. Smith, J. C. Knievel, B. Kosović, B. G. Brown, J. K. Balch, 2022: Weather Research and Forecasting – Fire Simulated Burned Area and Propagation Direction Sensitivity to Ignition Point Location and Time. *Fire*, **5**, 58.
* **Siems-Anderson, A. R.**, J. A. Lee, B. G. Brown, G. Wiener, S. Linden, 2020: Impacts of Assimilating Observations from Connected Vehicles into a Numerical Weather Prediction Model. *Trans. Res. Interdisciplinary Perspectives*, **8**, 100253.
* Walker, C. L., B. Boyce, C. P. Albrecht, **A. Siems-Anderson**, 2020: Will weather dampen self-driving vehicles? *Bull. Amer. Meteor. Soc.*, **101**, E1914–E1923.
* **Siems-Anderson, A. R.**, C. L. Walker, G. Wiener, W. P. Mahoney III, S. E. Haupt, 2019: An adaptive big data weather system for surface transportation. *Trans. Res. Interdisciplinary Perspectives*, **3**, 100071.
* Young, R., B. Welch, **A. Siems-Anderson**, 2019: Generating Weather Alerts Including High Wind Blowover Hazards Using Pikalert® for the Wyoming Connected Vehicle Pilot Project. *Proc. from the 98th Annual Meeting of the Transportation Research Board*, Washington, D.C., January 2019.
* **Siems-Anderson, A. R.**, and Coauthors, 2017: Use of the Pikalert® System in the Wyoming Department of Transportation Connected Vehicle Pilot Deployment. *PIARC Routes/Roads*, No 375, 4th quarter, 27–30.
* Steiner, M., **A. R. S. Anderson**, S. Landolt, S. Linden, 2015: Coping with Adverse Winter Weather: Emerging Capabilities in Support of Airport and Airline Operations. *Air Traffic Control*, 57-3, 36–45.
* Gochis and Coauthors, 2015: The Great Colorado Flood of September 2013. *Bull. Amer. Meteor. Soc.,* **96**, 1461–1487.
* Drobot, S., **A. R. S. Anderson**, C. Burghardt, P. Pisano, 2013: U.S. Public Preferences for Weather and Road Condition Information. *Bull. Amer. Meteor. Soc.*, **95**, 849–859.
* Roberts, R. D., **A. R. S. Anderson**, E. Nelson, B. G. Brown, J. W. Wilson, M. Pocernich, T. Saxen, 2012: Impacts of Forecaster Involvement on Convective Storm Initiation and Evolution Nowcasting. *Wea. Forecasting*, **27**, 1061–1089.
* **Anderson, A. R. S.**, M. Chapman, S. D. Drobot, A. Tadesse, B. Lambi, G. Wiener, and P. Pisano, 2012: Quality of mobile air temperature and atmospheric pressure observations from the 2010 Development Test Environment Experiment. *J. Appl. Meteor. Climotol.*, **51**, 691–701.
* Drobot, S., M. B. Chapman, **A. Anderson**, B. Lambi, P. A. Pisano, and G. Guevara, 2012: Tomorrow’s forecast: Informed drivers. *Transportation Research Circular*, **E-C162**, 560–572.
* Drobot, S., M. Chapman, **A. Anderson**, and P. Pisano, 2010: Vehicle data translator for road weather monitoring. *ITS International*, Sept/Oct.

Presentations

* **Siems-Anderson, A. R.**, A. DeCastro, S. S. Tessendorf, A. A. Jensen, 2023: Configuring the Model Evaluation Tools’ Method for Object-based Diagnostic Evaluation – Time Domain Tool for Numerical Weather Prediction Evaluation. *2nd Symposium on Community Modeling and Innovation*, Denver, CO, Amer. Meteor. Soc., 12A.2.
* **Siems-Anderson, A. R.**, 2022: *Road Weather Spotlight – Road Weather Data Sources and Applications*, National Operations Center of Excellence, Panelist.
* **Siems-Anderson, A. R.**, C. Walker, G. Wiener, S. Linden, T. Brummet, W. Petzke, P. McCarthy, J. Cowie, 2022: Road Weather in RAL. *RAL Snow Affinity Group*, Virtual, NCAR.
* **Siems-Anderson, A. R**., 2022: AMS ITS/Road Weather Liaison Report. *Snow and Ice Pooled Fund Cooperative Program (SICOP) Annual Meeting*, Virtual, AASHTO.
* **Siems-Anderson, A. R.**, J. Pearson, J. A. Lee, 2022: Case Studies Task. *Kuwait Sponsor Training*, Boulder, CO, NCAR.
* **Siems-Anderson, A. R.**, 2021: The American Meteorological Society Intelligent Transportation Systems/Surface Transportation Committee Update. *Road Weather Management Program Stakeholder Meeting*, Virtual, Federal Highway Administration.
* **Siems-Anderson, A. R.**, 2021: AMS ITS/Road Weather Liaison Report. *Snow and Ice Pooled Fund Cooperative Program (SICOP) Annual Meeting*, Virtual, AASHTO.
* **Siems-Anderson, A. R.**, 2021: *Autonomous vehicles: the importance of weather-related technology and data services*. Intermet.digital, Panelist.
* **Siems-Anderson, A. R.**, A. DeCastro, B. Kosovic, P. Jimenez, D. Muñoz-Esparza, J. Knieval, 2020: Verifying the Performance of a Coupled Fire-Atmosphere Model. *User-oriented Evaluation of High Impact Weather*, Webinar, World Meteor. Organization.
* **Siems-Anderson, A. R.**, G. Wiener, S. Linden, W. Petzke, T. Brummet, N. Nguyen, P. McCarthy, 2020: The Pikalert® System. *Annual Meeting*, Virtual, Amer. Assoc. Geographers.
* **Siems-Anderson, A. R.**, A. DeCastro, B. Kosivic, P. Jimenez, D. Muñoz-Esparza, J. Knievel, 2020: Verifying the Performance of the Colorado Fire Prediction System. *26th Conf. on Probability and Statistics*, Boston, MA, Amer. Meteor. Soc., 3.6.
* **Siems-Anderson, A. R.**, G. Wiener, S. Linden, T. Brummet, W. Petzke, P. McCarthy, B. Welch, V. Garcia, A. Ragan, D. Gopalakrishna, E. Hsu, 2019: The Wyoming Department of Transportation Connected Vehicle Pilot Deployment. *35th Conference on Environmental Information Processing Technologies*, Phoenix, AZ, Amer. Meteor. Soc., 11B.3.
* **Siems-Anderson, A.**, A. Ragan, 2018: Wyoming DOT Connected Vehicle Pilot Deployment Program: Pikalert Implementation. *Road Weather Management Stakeholder Meeting*, Louisville, KY, Federal Highway Administration.
* **Siems-Anderson, A.**, 2018: The Maintenance Decision Support System (MDSS). *Tech Transfer Internal Engagement Workshop*, Boulder, CO, University Corporation for Atmospheric Research.
* **Siems-Anderson, A. R.**, and Coauthors, 2018: Use of the Pikalert® System in the Wyoming Department of Transportation Connected Vehicle Pilot Deployment. *XVth International Winter Road Congress*, Gdańsk, Poland, World Road Association.
* **Siems-Anderson, A. R.**, 2018: Evaluation of Fire-Weather Predictions by the Colorado Fire Prediction System (CO-FPS): Results and Lessons Learned. *25th Conf. on Probability and Statistics*, Austin, TX, Amer. Meteor. Soc., 6.4.
* **Siems-Anderson, A. R.**, 2017: Vehicle-based Weather Observations. *Workshop on Data Science for High Impact Weather and Flood Prediction*, Henley-on-Thames, UK, Univ. of Reading.
* **Siems-Anderson, A. R.**, G. Wiener, S. Linden, T. Brummet, W. Petzke, P. McCarthy, 2017: The Pikalert® System – Using Vehicles and Radar to Keep Drivers Safe. *The 12th Conf. on Mesoscale Convective Systems and High-Impact Weather in East Asia*, Taipei, Taiwan, East Asia Weather Research Association.
* **Anderson, A. R. S.**, V. Garcia, D. Gopalakrishna, 2017: The Wyoming Connected Vehicle Pilot Deployment. *33rd Conf. on Environmental Information Processing Technologies*, Seattle, WA, Amer. Meteor. Soc., 2B.5.
* **Siems-Anderson, A.**, 2016: Road Weather Modeling at NCAR. *Western Snow&Ice Conference*, Loveland, CO, Amer. Public Works Association.
* **Anderson, A. R. S.**, J. A. Lee, B. G. Brown, G. Wiener, S. Linden, L. Sturges, R. Patterson, P. Pisano, 2016: Using Mobile Vehicle Observations to Improve Numerical Prediction Forecasts, *20th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS)*, New Orleans, LA, Amer. Meteor. Soc., 5.3.
* **Anderson, A.** **R. S.**, G. Wiener, S. Linden, W. Petzke, G. N. Guevara, B. C. Boyce, P. Pisano, 2016: The Pikalert® Vehicle Data Translator – Updates and Applications. *32nd Conference on Environmental Information Processing Technologies*, New Orleans, LA, Amer. Meteor. Soc., 11B.4.
* **Anderson, A.** **R. S.**, J. A. Lee, S. D. Drobot, P. Pisano, 2015: Using Connected Vehicle Data to Fill In the Observation Gap for Data Assimilation. *19th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS)*, Phoenix, AZ, Amer. Meteor. Soc, TJ7.2.
* **Anderson, A. R. S.**, 2014: Dual-Polarization Radar: Implications for Road Weather. *Aurora Program Board Meeting*, Boulder, CO, Aurora Program.
* **Anderson, A. R. S.**, R. Bullock, B. G. Brown, 2014: Statistical Verification of Short Term Explicit Prediction (STEP) Program precipitation and streamflow forecasts for the 2013 Colorado Front Range flooding event. *22nd Conf. on Probability and Statistics in the Atmospheric Sciences*, Atlanta, GA, Amer. Meteor. Soc., 4.3.
* **Anderson, A. R. S.**, S. D. Drobot, M. Chapman, B. Lambi, P. Pisano, G. N. Guevara, 2013: A Comparison and Validation of Observations from Three Different Instruments Attached to Moving Vehicles during DOCS and the IMO Study. *8th Symposium on Policy and Socio-economic Research*, Austin, TX, Amer. Meteor. Soc., 7.4.
* **Anderson, A. R. S.**, J. W. Wilson, T. J. Emerson, Z. Ying, R. Roberts, 2012: Using Winds From the 4-D Variational Doppler Radar Assimilation System (VDRAS) to Nowcast Convection in Taiwan. *16th. Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS)*, New Orleans, LA, Amer. Meteor. Soc., 7.6.
* **Anderson, A. R. S.**, S. D. Drobot, M. Chapman, G. Wiener, B. Lambi, P. Pisano, G. N. Guevara, 2012: Development of Algorithms to Determine Precipitation, Pavement Condition, and Visibility Hazards Along Roadways Using Mobile Observations. *28th Conf. on Interactive Information Processing Systems (IIPS)*, New Orleans, LA, Amer. Meteor. Soc., 11B.4.
* **Anderson, A.** **R. S.**, S. Drobot, M. Chapman, C. Ammann, 2011: Example Impacts of Climate Change on Transportation Weather Decision Making. *Climate Adaptation & Transportation Workshop*, Washington, DC, Environmental and Energy Study Institute/Center for Clean Air Policy.
* **Anderson, A. R. S.**, J. W. Wilson, T. J. Emerson, Z. Ying, R. D. Roberts, J. Sun, 2011: Using winds from the 4-D Variational Doppler Radar Analysis System (VDRAS) to nowcast convection in Taiwan. *35th Conf. on Radar Meteorology*, Pittsburgh, PA, Amer. Meteor. Soc., 19A.4.
* **Anderson, A. R. S.**, R. D. Roberts, M. R. Volkmer, D. W. Sharp, 2011: Collaborative Efforts by the Atmospheric Research and Operations Communities for Improving a Thunderstorm Nowcasting System. *24th Conference on Weather and Forecasting/20th Conference on Numerical Weather Prediction*, Seattle, WA, Amer. Meteor. Soc., J20.8.
* **Anderson, A. R. S.**, M. Chapman, S. D. Drobot, A. Tadesse, P. Pisano, 2011: Quality of Mobile Observations Collected during the 2010 Development Testbed Environment Experiment. *27th Conference on Interactive Information Processing Systems (IIPS)*, Seattle, WA, Amer. Meteor. Soc., 2A.3.
* **Anderson, A. R. S.**, J. Sun, R. D. Roberts, W.-C. Lee, 2010: A comparison of SOWMEX/TIMREX wind observations with WRF and VDRAS 3-D wind fields on 31 May 2008. *3rd SoWMEX/TiMREX Science Workshop*, Taipei, Taiwan, Taiwan Weather Research Program, 4.2.
* **Anderson, A. R. S.**, T. J. Lang, S. A. Rutledge, 2009: Performance of a Statistical Framework for Analyzing Large Lightning and Radar Datasets. *4th Conf. on the Meteorological Applications of Lightning Data*, Phoenix, AZ, Amer. Meteor. Soc., P2.2. Poster presentation.