

Gregory R. Herman

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Education

- Nov. 2015-: Ph.D. Candidate, Dept. of Atmospheric Science, Colorado State University
Advisor: Russ Schumacher
Dissertation: "A New Age of Post-Processing for a New Age of Models"
Expected Graduation: October 2018
- Nov. 2015: M.S. (Atmospheric Science), Colorado State University
Advisor: Russ Schumacher
Thesis: "Model Post-Processing for the Extremes: Improving Forecasts of Locally Extreme Rainfall"
- Jun. 2013: B.S. (Physics, Atmospheric Science, Computer Science), *magna cum laude*,
with honors in Physics, University of Washington
Halbert and Nancy Robinson Center's Academy for Young Scholars Program

Professional Positions

- Aug 2018-Present: Atmospheric Scientist, The Climate Corporation
Aug 2013-Present: Graduate Research Assistant, Colorado State University
Jun 2012-May 2013: Software Development Intern, 3TIER
Developed analogue and ensemble forecasting capabilities for wind energy prediction

Publications

- (see <http://schumacher.atmos.colostate.edu/gberman/mypubs.php> for manuscripts)
- 2018: S.M. Hitchcock, R.S. Schumacher, **G.R. Herman**, M.C. Coniglio, M.D. Parker, C.L. Ziegler: Evolution of Pre- and Post-Convective Environmental Profiles from Mesoscale Convective Systems During PECAN. *Monthly Weather Review*, submitted (June 2018).
- 2018: **Herman, G.R.**: Forecasting Severe Weather with Random Forests. *Monthly Weather Review*, submitted (May 2018).
- 2018: **Herman, G.R.** and R.S. Schumacher: Perplexing Problems with Flash Flood Verification: Pondering Precipitation Proxies. *Journal of Hydrometeorology*, in revisions.
- 2018: **Herman, G.R.** and R.S. Schumacher: "Dendrology" in Numerical Weather Prediction: What Random Forests and Logistic Regression Tell Us About Forecasting Extreme Precipitation. *Monthly Weather Review*, 146 (6), 1785-1812.
- 2018: **Herman, G.R.** and R.S. Schumacher: Money Doesn't Grow on Trees, but Forecasts Do: Forecasting Extreme Precipitation with Random Forests. *Monthly Weather Review*, 146 (5), 1571-1600.
- 2018: **Herman, G.R.**, E.R. Nielsen, and R.S. Schumacher: Probabilistic Verification of Storm Prediction Center Convective Outlooks. *Weather and Forecasting*, 33 (1), 161-184.
- 2016: **Herman, G.R.** and R.S. Schumacher: Extreme Precipitation in Models: An Evaluation. *Weather and Forecasting*, 31 (6), 1853-1879.
- 2016: Nielsen, E.R., **G.R. Herman**, R.C. Tournay, J.M. Peters, and R.S. Schumacher: Reply to "Comments on 'Double Impact: When Both Tornadoes and Flash Floods Threaten the Same Place at the Same Time.'" *Weather and Forecasting*, 31 (5), 1723-1727.

- 2016: **Herman, G.R.** and R.S. Schumacher: Using Reforecasts to Improve Forecasting of Fog and Visibility for Aviation. *Weather and Forecasting*, 31 (2), 467-482.
- 2015: Nielsen, E.R., **G.R. Herman**, R.C. Tournay, J.M. Peters, and R.S. Schumacher: Double Impact: When Both Tornadoes and Flash Floods Threaten the Same Place at the Same Time. *Weather and Forecasting*, 30 (6), 1673-1693.

Presentations

- 2018: **Herman, G.R.** and R.S. Schumacher: Advances in Using Random Forests to Forecast Heavy Precipitation and Flash Floods. *98th Annual Meeting Amer. Meteor. Soc.*
- 2018: **Herman, G.R.** and R.S. Schumacher: Using Machine Learning to Predict Warm-Season Convection over Northeastern Colorado. *98th Annual Meeting Amer. Meteor. Soc.*
- 2018: **Herman, G.R.** and R.S. Schumacher: Thorough Probabilistic Verification of Storm Prediction Center Forecasts. *98th Annual Meeting Amer. Meteor. Soc.*
- 2018: **Herman, G.R.** and R.S. Schumacher: Tackling the Verification of Flash Floods. Format: Poster. *98th Annual Meeting Amer. Meteor. Soc.*
- 2017: **Herman, G.R.** and R.S. Schumacher: Creating High-Resolution Convection Forecasts over Northeast Colorado using Random Forests. Format: Oral. *30th Conference on Climate Variability and Change, 24th Conference on Probability and Statistics in the Atmospheric Sciences, 16th Conference on Artificial Intelligence and its Applications to the Environmental Sciences.*
- 2017: **Herman, G.R.** and R.S. Schumacher: Probabilistic Locally Extreme Precipitation Forecasts with Machine Learning. Format: Oral. *30th Conference on Climate Variability and Change, 24th Conference on Probability and Statistics in the Atmospheric Sciences, 16th Conference on Artificial Intelligence and its Applications to the Environmental Sciences.*
- 2017: (Invited Talk) **Herman, G.R.**, D. Stovern, and R.S. Schumacher: Introduction to Machine Learning Probabilities of ARI Exceedance (CSU-MLP). *2017 Flash Flood and Intense Rainfall Experiment*. Weather Prediction Center, College Park, MD.
- 2017: **Herman, G.R.** and R.S. Schumacher: Advancing Probabilistic Forecasts of Locally Extreme Precipitation through Machine Learning. *97th Annual Meeting of the American Meteorological Society.*
- 2016: **Herman, G.R.**, E.R. Nielsen, J.M. Peters, and R.S. Schumacher: Predicting ‘Double Impact’ Concurrent and Collocated Tornadoes and Flash Floods. Format: Poster. *28th Conference on Severe Local Storms.*
- 2016: **Herman, G.R.**, J.M. Peters, E.R. Nielsen, and R.S. Schumacher: Tornadoes and the Nocturnal Transition: Will they Persist? Format: Poster. *28th Conference on Severe Local Storms.*
- 2016: (Invited Talk) Nielsen, E.R and **G.R. Herman**: Double Impact: When both tornadoes and flash floods threaten the same place at the same time. National Weather Service Weather Forecast Office (Severe Weather Seminar), Cheyenne, WY.
- 2016, 2017, 2018: (Invited Talk) **Herman, G.R.**: Extreme Value Theory: A Practical Introduction. Colorado State University (ATS 655: Objective Analysis), Fort Collins, CO.
- 2016: (Invited Talk) **Herman, G.R.**: Using Reforecasts to Improve Forecasting of Fog and Visibility for Aviation. Vaisala Inc., Louisville, CO.
- 2016: **Herman, G.R.** and R.S. Schumacher: Locally Extreme Precipitation in Models: Model Climatologies by Extreme Value Theory. Format: Oral. *96th Annual Meeting of the American Meteorological Society.*
- 2016: **Herman, G.R.** and R.S. Schumacher: Improving Forecasts for Locally Extreme Rainfall: A Probabilistic Approach. Format: Oral. *96th Annual Meeting of the American Meteorological Society.*

- 2016: **Herman, G.R.**: Using Reforecasts to Improve Forecasting of Fog and Visibility for Aviation. Format: Poster. *96th Annual Meeting of the American Meteorological Society*.
- 2016: **Herman, G.R.**, E.R. Nielsen, R.C. Tournay, J.M. Peters, and R.S. Schumacher: Diagnosing the Meteorology of ‘Double Impact’ Tornado/Flash Flood Events. Format: Poster. *96th Annual Meeting of the American Meteorological Society*.
- 2015: **Herman, G.R.** and R.S. Schumacher: Generating Skillful and Reliable Forecasts for Locally Extreme Rainfall. Format: Oral. *27th Conference on Weather Analysis and Forecasting/23rd Conference on Numerical Weather Prediction*.
- 2015: **Herman, G.R.** and R.S. Schumacher: Forecast Improvement of Locally Heavy Rainfall Events through Diagnosis and Examination of Model Precipitation Climatologies. Format: Poster. *95th Annual Meeting of the American Meteorological Society*.

Funded Grants

- 2018-2020: NOAA, Joint Technology Transfer Initiative: “Intelligent post-processing of convection-allowing model output to inform Weather Prediction Center outlooks and forecasts.” Total Award: \$333,187. Co-PI. Lead PI: R.S. Schumacher
- 2016-2018: NOAA, Joint Technology Transfer Initiative: “Improving Probabilistic Forecasts of Extreme Rainfall through Intelligent Processing of High-Resolution Ensemble Predictions.” Total Award: \$223,420. Co-Investigator. Lead PI: R.S. Schumacher
- 2015-2016: NOAA, VORTEX-SE: “Multi-disciplinary investigation of concurrent tornadoes and flash floods in the Southeastern US.” Total Award: \$143,197. Co-Investigator. Lead PI: R.S. Schumacher; other Co-Investigators: J. Henderson, E.R. Nielsen, J.M. Peters, R.C. Tournay.

Research-To-Operations Experience

- 2016-Present: Joint Technology Transfer Initiative: Transfer of extreme precipitation forecasting models to Weather Prediction Center to assist operational forecasters with creating Excessive Rainfall Outlooks. Participant in Flash Flood and Intense Rainfall Experiment (2014, 2016, 2017); algorithm development and operational transition of codes is currently ongoing.
- 2016: At the request of NWS San Diego, trained and implemented models to generate real-time forecasts of cloud ceiling and visibility for KSAN and KSNA based on methods developed in Herman and Schumacher (2016). Later expanded for TAF sites for NWS Cheyenne.

Field Experience

- 2017: Verification of the Origins of Rotation in Tornadoes Experiment-Southeast (VORTEX-SE): Mar-May 2017
Rawinsonde launches, Northern Alabama
- 2016-2017: CSU Convective Cloud Outflows and Updrafts Experiment (C³LOUD-Ex): Field Operations Jul 2016, May-Jun 2017
Mobile rawinsonde launches, NE CO/SE WY/SW NE; a primary forecaster; development of forecast tools; operations planning
- 2016: NUCAPS, NE CO, Summer 2016
Assisted in training crews in rawinsonde launches
- 2015: Olympic Mountains Experiment (OLYMPEX): Dec 2015
Rawinsonde launches, Pacific coast of Washington
- 2015: Plains Elevated Convection at Night (PECAN): May-Jul 2015
Mobile nighttime rawinsonde launches over central US (KS, NE, OK, TX, IA, MN, WI, IL, IN, MO, SD)
- 2014: Front Range Air Quality and Photochemistry Experiment (FRAPPÉ): Jul-Aug 2014
Forecast and nowcast assistance for aircraft missions over Colorado and vicinity

Teaching Experience

2017: Teaching Assistant, ATS 655 Objective Analysis. Instructor: Elizabeth Barnes

2016: Teaching Assistant, ATS 641 Mesoscale Meteorology. Instructor: Russ Schumacher

2010: Teaching Assistant, Summer Stretch Discrete Mathematics

Service

2018-Present: American Meteorological Society Committee on Artificial Intelligence Applications to Environmental Science Short Course Development Team

2015-Present: CSU Sounding Outreach Team

2014: Science Olympiad exam writer, Regional and State

2011: Student volunteer, *91st Annual Meeting of the American Meteorological Society*

2010-12: Webmaster, UW Student Chapter of American Meteorological Society

Reviewer

Weather and Forecasting

Journal of Applied Meteorology and Climatology

Monthly Weather Review

Cogent Geosciences

Meteorology and Atmospheric Physics

Advances in Statistical Climatology, Meteorology and Oceanography

Academic Awards/Honors

- 2014, 2015, National Science Foundation Graduate Research Fellowship, Honorable Mention
- 2013-2014, CSU PRSE Fellowship
- 2013, Phil Church Award, UW Atmospheric Science
- Phi Beta Kappa
- Sigma Pi Sigma
- UW Quarterly Dean's List every quarter (Autumn, Winter, Spring)
- 2011, UW Department of Atmospheric Sciences Bruce Caldwell Memorial Special Scholarship

Professional Affiliations

American Meteorological Society: 2009-Present

FORTCAST (local chapter, AMS): 2013-Present

Miscellaneous

WxChallenge 1st Place Team Entire Season, 2017-18

WxChallenge 1st Place Entire Season, MS/PhD, 2016-17

WxChallenge 1st Place Overall, Nashville, TN, 2016-17

WxChallenge, 2nd Place MS/PhD, Kodiak, AK, 2016-17

WxChallenge, 2nd Place MS/PhD, Cleveland, OH, 2017-18

United States Bridge Junior Internationalist (2013, 2014, 2016, 2018)

National Collegiate Bridge Champion (2013)

Founded/President of University of Washington Bridge Club (2011-13)

References

Available upon request