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## EDUCATION

**Ph.D. in Meteorology**, August 2014  
The Pennsylvania State University, University Park, PA

**B.S. in Meteorology and Applied Mathematics**, May 2009 (Magna Cum Laude)  
Millersville University of Pennsylvania, Millersville, PA

## RESEARCH INTERESTS

Data assimilation, numerical weather prediction, probabilistic forecasting and verification, atmospheric dynamics and predictability, tropical cyclones, and mesoscale meteorology

## PROFESSIONAL EXPERIENCE

**University of Maryland, Department of Atmospheric and Oceanic Science**, College Park, MD  
Assistant Professor, August 2018 – present

**NOAA Atlantic Oceanographic and Meteorological Laboratory, Hurricane Research Division**, Miami, FL  
Affiliate, August 2018 – present

**NOAA Atlantic Oceanographic and Meteorological Laboratory, Hurricane Research Division**, Miami, FL  
National Research Council Research Associateship Postdoctoral Fellow, March 2017 – August 2018

**Cooperative Institute for Mesoscale Meteorological Studies, NOAA National Severe Storms Laboratory, and the University of Oklahoma**, Norman, OK  
Postdoctoral Research Associate, August 2016 – March 2017

**National Center for Atmospheric Research**, Boulder, CO  
Advanced Study Program Postdoctoral Fellow, August 2014 – August 2016

**The Pennsylvania State University**, University Park, PA  
Research Assistant, May 2009 – August 2014

**National Center for Atmospheric Research**, Boulder, CO  
Graduate Student Visitor, February 2012 – April 2012

**National Weather Center Research Experience for Undergraduates (REU)**, Norman, OK

## REFEREED JOURNAL PUBLICATIONS

- Poterjoy, J.**, L. J. Wicker, and M. Buehner: Progress in the development of a localized particle filter for data assimilation in high-dimensional geophysical systems., in press.
- Morzfeld, M., D. Hodyss, **J. Poterjoy**, 2018: Variational particle smoothers and their localization, *Q J R Meteorol Soc.* **2018**, 144:806 – 825.
- Poterjoy, J.**, R. A. Sobash, and J. L. Anderson, 2017: Convective-scale data assimilation for the Weather Research and Forecasting model using the local particle filter., **145**, 1897 – 1918.
- Poterjoy, J.**, and J. L. Anderson, 2016: Efficient assimilation of simulated observations in a high-dimensional geophysical system using a localized particle filter. *Mon. Wea. Rev.*, **144**, 2007 – 2020.
- Poterjoy, J.** and F. Zhang, 2016: Comparison of hybrid four-dimensional data assimilation methods with and without the tangent linear and adjoint models for predicting the life cycle of Hurricane Karl (2010). *Mon. Wea. Rev.* **144**, 1449 – 1468.
- Poterjoy, J.**, 2016: A localized particle filter for high-dimensional nonlinear systems. *Mon. Wea. Rev.*, **144**, 59 – 76.
- Poterjoy, J.** and F. Zhang, 2015: Systematic comparison of four-dimensional data assimilation methods with and without a tangent linear model using hybrid background error covariance: E4DVar versus 4DEnVar. *Mon. Wea. Rev.*, **143**, 1601 – 1621.
- Poterjoy, J.** and F. Zhang, 2014: Inter-comparison and coupling of ensemble and four-dimensional variational data assimilation methods for the analysis and forecasting of Hurricane Karl (2010). *Mon. Wea. Rev.*, **142**, 3347 – 3364.
- Poterjoy, J.** and F. Zhang, 2014: Predictability and genesis of Hurricane Karl (2010) examined through the EnKF assimilation of field observations collected during PREDICT. *J. Atmos. Sci.*, **71**, 1260 – 1275.
- Poterjoy, J.**, F. Zhang, and Y. Weng, 2014: The effects of sampling errors on the EnKF assimilation of inner-core hurricane observations. *Mon. Wea. Rev.*, **142**, 1609 – 1630.
- Zhang, X., X.-Y. Huang, L. Yianyu, **J. Poterjoy**, Y. Weng, F. Zhang, and H. Wang, 2014: Development of an efficient regional four-dimensional variational data assimilation system for WRF. *J. Atmos. Oceanic Technol.*, **31**, 2777 – 2794.
- Zhang, F., M. Zhang, and **J. Poterjoy**, 2013: E3DVar: Coupling an ensemble Kalman filter with three-dimensional variational data assimilation in a limited-area weather prediction model and comparison to E4DVar. *Mon. Wea. Rev.*, **140**, 900 – 917.
- Xie, B., F. Zhang, Q. Zhang, **J. Poterjoy**, and Y. Weng, 2013: Observing strategy and observation targeting for tropical cyclones using ensemble-based sensitivity analysis and data assimilation. *Mon. Wea. Rev.*, **141**, 1437 – 1453.
- Poterjoy, J.** and F. Zhang, 2011: Dynamics and structure of forecast error covariance in the core of a developing hurricane. *J. Atmos. Sci.*, **68**, 1586 – 1606.

## PUBLICATIONS SUBMITTED, IN REVISION, AND IN PROGRESS

- Poterjoy, J.**, G. Alaka, K. Ryan, L. Bucci, X. Zhang: An experimental basin-scale HWRF analysis and prediction system for model development, data assimilation research, and observing system design, in progress.

## INVITED CONFERENCE AND WORKSHOP PRESENTATIONS

- Regional Weather Prediction Using the Local Particle Filter in an Experimental HWRF Modeling System, 2<sup>nd</sup> ADAPT Symposium on "Advanced Understanding, Monitoring and Prediction of Weather, Climate and Environmental systems," State College, PA, 2018

- Regional Weather Forecasting Using the Local Particle Filter, *5<sup>th</sup> International Workshop on Nonhydrostatic Models*, Tokyo, Japan, 2018
- Toward the Application of Particle Filters for Numerical Weather Prediction and Research, *The 8<sup>th</sup> Ensemble Kalman Filtering Workshop*, Sainte-Adele, Canada, 2018
- Localized Particle Filters for Weather Prediction and Research, *National Strategic Computing Initiative Workshop*, Arlington, VA, 2017
- Storm-Scale Weather Analysis and Prediction at the NOAA National Severe Storms Laboratory Using a Non-Gaussian Filter, *3<sup>rd</sup> RIKEN International Symposium on Data Assimilation*, Kobe, Japan, 2017
- Probabilistic Weather Analysis and Prediction Using the Local Particle Filter, *Advances in Data Assimilation, Predictability, and Uncertainty Quantification, American Geophysical Union Fall Meeting*, San Francisco, CA, 2016
- Efficient Assimilation of Observations via a Localized Particle Filter in High-Dimensional Geophysical Systems, *Perspectives on Model-informed Data Assimilation, SIAM Conference on Uncertainty Quantification*, Lausanne, Switzerland, 2016.
- Hybrid Four-Dimensional Data Assimilation With and Without Tangent Linear Model Operators. *6<sup>th</sup> EnKF Workshop*, Buffalo, NY, 2014

## INVITED LECTURES

- Big Data, Very Big Computers, and the Endless Pursuit for an "Honest" Weather Prediction System, *Department of Meteorology, Millersville University*, Millersville, PA, 2019
- Progress in the Development of a Localized Particle Filter for Weather Prediction, *Earth System Science Interdisciplinary Center*, College Park, MD, 2019
- Progress in the Development of a Localized Particle Filter for Regional Weather Prediction, *NASA Goddard, Global Modeling and Assimilation Office*, Greenbelt, MD, 2018
- Progress in the Development of a Localized Particle Filter for Numerical Weather Prediction and Research, *Japan Meteorological Agency, Meteorological Research Institute*, Tokyo, Japan, 2018
- Nonlinear Data Assimilation for Geophysical Analysis, Prediction, and Research, *North Carolina State University, Department of Marine, Earth, and Atmospheric Sciences*, Raleigh, NC, 2017.
- Progress in the Development of a Localized Particle Filter for Atmospheric Analysis, Prediction, and Research, *University of Maryland, Department of Atmospheric and Oceanic Science*, College Park, MD, 2017
- Nonparametric Data Assimilation for Weather Research and Forecasting, *University of Miami, Department of Computer Science*, Miami, FL, 2017
- Storm-Scale Weather Analysis and Prediction Using a Nonparametric Filter, *University of Arizona, Department of Mathematics*, Tucson, AZ, 2016
- Progress Toward the Development of a Nonlinear Filter for High-Dimensional Data Assimilation in Geoscience, *Penn State University, Center for Advanced Data Assimilation and Predictability Techniques*, University Park, PA, 2016
- Hybrid and Coupling of Ensemble and Variational Data Assimilation: An Informative Comparison of Adjoint- and Ensemble-Based Four-Dimensional Strategies, *Penn State University, Center for Advanced Data Assimilation and Predictability Techniques*, University Park, PA, 2016
- Probabilistic Storm-Scale Analysis and Prediction Using a Nonparametric Ensemble Filter: Implications for Tropical Cyclone Forecasting, *NOAA Atlantic Oceanographic and Meteorological Laboratory*, Miami, FL, 2016
- An Efficient Nonparametric Data Assimilation Method for Atmospheric Research and Ensemble Forecasting. *National Weather Center*, Norman, OK, 2016
- Efficient Nonparametric Data Assimilation for Atmospheric Research and Prediction. *Florida State University, Department of Earth, Ocean and Atmospheric Science*, Tallahassee, FL, 2016
- A Localized Particle Filter for Data Assimilation in High-dimensional Nonlinear Systems. *STATMOS*

*Summer School in Data Assimilation*, Boulder, CO, 2015

- Hybrid and Coupling of Ensemble and Variational Data Assimilation. 12<sup>th</sup> CAS-TWAS-WMO Forum: *Data Assimilation Summer School*, Beijing, China, 2015
- Introduction to NCAR Data Assimilation Research Testbed (DART). 12<sup>th</sup> CAS-TWAS-WMO Forum: *Data Assimilation Summer School*, Beijing, China, 2015
- A Localized Particle Filter for Large Dimensional State Estimation. 12<sup>th</sup> CAS-TWAS-WMO Forum: *Coupled Data Assimilation Symposium*, Beijing, China, 2015
- Can We do Better Than the Kalman Filter? A Localized Particle Filter for Large Dimensional State Estimation. *Peking University, Department of Atmospheric and Oceanic Sciences*, Beijing, China, 2015
- A Localized Particle Filter for Large Dimensional State Estimation. *Chinese Academy of Meteorological Sciences*, Beijing, China, 2015
- A Localized Particle Filter for High-dimensional Nonlinear Systems. *Cooperative Institute for Research in the Atmosphere*, Fort Collins, CO, 2015
- Ensemble Filtering for Large-Dimensional Nonlinear Systems. *Penn State University, Department of Statistics*, University Park, PA, 2014
- Hybrid Data Assimilation for Tropical Cyclone Analysis and Prediction. *Stony Brook University, Department of Marine and Atmospheric Sciences*, Stony Brook, NY, 2014.

## UNIVERSITY TEACHING EXPERIENCE

**Co-Lecturer**, Pennsylvania State University, METEO 597B, *Data Assimilation*, Spring 2013

- Lecture topics: optimal interpolation, EnKF, 3DVar, 4DVar, adjoint sensitivity analysis, ensemble sensitivity analysis, observation impact, parameter estimation, and hybrid data assimilation
- Additional tasks: assisted in the development of the course curriculum, and constructed and graded programming lab assignments

**Guest Lecturer**, University of Oklahoma, METR 6313, *Advanced Topics in Data Assimilation*, Spring 2017

- Lecture topics: Introduction to particle filters and the local particle filter

**Guest Lecturer**, Pennsylvania State University, METEO 526, *Numerical Weather Prediction*, Spring 2011

- Lecture topics: Ensemble Kalman filters and Lorenz (1963) model tutorial

**Teaching Assistant**, Pennsylvania State University, METEO 474, *Computer Methods in Meteorological Analysis and Forecasting*, Spring 2011

- Lab assistant for an undergraduate data mining course
- Tasks: graded labs, answered questions from students, and organized a capstone project

## HONORS AND AWARDS

- National Research Council Postdoctoral Fellowship, NOAA Atlantic Oceanographic and Meteorological Laboratory, 2017 – 2018
- Advanced Study Program Postdoctoral Fellowship, National Center for Atmospheric Research, 2014 – 2016
- Best student presentation award, 18<sup>th</sup> *Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface*, Atlanta, GA, 2014
- Best student presentation award, 15<sup>th</sup> *Conference on Mesoscale Processes*, Portland, OR, 2013
- Student travel award, 18<sup>th</sup> *Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface*, Atlanta, GA, 2014
- Student travel award, 15<sup>th</sup> *Conference on Mesoscale Processes*, Portland, OR, 2013

- National Science Foundation Graduate Research Fellowship Program honorable mention award, 2010 and 2011

## PROFESSIONAL ACTIVITIES

- Primary developer of the local particle filter, a nonlinear data assimilation technique available freely through the open source NCAR Data Assimilation Research Testbed (DART) software package
- Lead developer of the AOML-UMD ensemble prediction system, a research testbed for modeling and data assimilation research with the HWRF model
- Helped develop and maintain the Pennsylvania State University WRF-EnKF data assimilation system and its hybrid with WRF-3DVar, -4DVar, and 4D-ensemble-Var
- Associate editor of *Monthly Weather Review*
- Reviewer for several scientific journals, including *Advances in Atmospheric Science*, *Advances in Meteorology*, *Atmospheric Research*, *Journal of Advances in Modeling Earth Systems*, *Journal of Applied Meteorology and Climatology*, *Journal of Atmospheric Sciences*, *Journal of Climate*, *Journal of Geophysical Research – Atmospheres*, *Monthly Weather Review*, *Physica D: Nonlinear Phenomenon*, *Ocean Dynamics*, *Natural Hazards*, *Quarterly Journal of the Royal Meteorological Society*, *Tellus A: Dynamic Meteorology and Oceanography*, and *Weather and Forecasting*
- Organizing committee member, *8<sup>th</sup> EnKF Workshop*, Sainte-Adele, Canada, 2018
- Invited participant, *NSF “National Strategic Computing Initiative” meeting*, Arlington, VA, 2017
- Organizing committee member, *7<sup>th</sup> EnKF Workshop*, University Park, PA, 2016
- Summer School Lecturer, *CAS-TWAS-WMO Data Assimilation Summer School*, Beijing, China, 2015
- Summer School Lecturer, *STATMOS Summer School in Data Assimilation*, Boulder, CO, 2015
- Co-author, *8<sup>th</sup> International Workshop on Tropical Cyclones: Subtopic 4.3 – structure change forecasting*, 2014
- Invited participant, *NSF “Big Weather” workshop*, Boulder, CO, 2014
- Invited participant, *NSF EarthCube workshop*, Boulder, CO, 2012
- Student participant, *Advanced Mathematical Methods to Study Atmospheric Dynamical Processes and Predictability workshop in Banff*, Canada, 2011