

Steven M. Cavallo

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EDUCATION

- *Ph.D.*, Atmospheric Sciences
University of Washington, Seattle, WA, 2009
Advisor: Dr. Gregory J. Hakim
- *M.S.*, Atmospheric Sciences
University of Washington, Seattle, WA, 2006
Advisor: Dr. Gregory J. Hakim
- *B.S., Summa Cum Laude*, Meteorology
Florida State University, Tallahassee, FL, May 2003
Minors: Mathematics, Physics, Computer Science
Advisors: Dr. Albert Barcion, Dr. Phillip Cunningham

PROFESSIONAL EXPERIENCE

- *Assistant Professor* November 2011-Present
University of Oklahoma, School of Meteorology
Affiliate faculty, Center for Analysis and Prediction of Storms (CAPS)
Fellow of the Cooperative Institute for Mesoscale Meteorological Studies (CIMMS)
- *Postdoctoral Fellow* June 2009-October 2011
National Center for Atmospheric Research, MMM Division
National Science Foundation Office of Polar Programs
Postdoctoral advisor: Dr. Chris Snyder
Arctic vortex dynamics, data assimilation, real-time numerical modeling with Advanced Hurricane WRF (AHW) model, model development.
- *Graduate Research Assistant* Fall 2003-June 2009
Department of Atmospheric Sciences, University of Washington
Model physics and interactions, vortex dynamics, and Arctic climate.
Operated mesoscale numerical models for both real data and idealized experiments.
Developed and implemented a real-time modeling system and web page.
- *Academic Tutor* Fall 2006-June 2009
Student-Athlete Academic Services, University of Washington
Tutored regularly for beginning and advanced atmospheric science, mathematics, physics, and geography classes for individuals and large groups.
- *Teaching Assistant* Spring 2005
Department of Atmospheric Sciences, University of Washington
Introduction to Weather
Led quiz sections, set up and performed lab demonstrations, collaborated daily in a group environment, created exams and homework sets.

COMPUTER EXPERIENCE

- Numerical Models: Weather and Research Forecasting (WRF), Community Atmospheric Model (CAM), Advanced Hurricane WRF (AHW), Rapid Radiative Transfer Model (RRTM)
- Programming Languages: Fortran 77/90, C, HTML, LaTeX, Python
- Software and Operating Systems: Matlab, NCL, GEMPAK, IVE, GARP, Unix, Linux, Adobe Illustrator, MS Word, MS Excel, MS Powerpoint

AWARDS, HONORS, MEMBERSHIPS, AND ACTIVITIES

- NSF multi-division panelist
- Recipient of NSF OPP Postdoctoral Fellowship in Polar Regions Research 2010-2011
- Recipient of 2009 Atmosphere, Oceans, and Fluid Dynamics student presentation award
- Recipient of the Father James B. Macelwane Award by the American Meteorological Society
- Invited Participant: US THORPEX Science Steering Committee Legacy Planning Meeting, Silver Spring, Maryland, USA
- Invited speaker: International Symposium on Earth-Science Challenges, October 2013, Kyoto University, Kyoto, Japan
- Invited speaker: The Weather-Climate Intersection: Advances and Challenges, NCAR ASP Summer Colloquium, June 2012, Boulder, Colorado, USA
- Invited participant: Climate Science Day on Capitol Hill, February 2012, Washington D.C., USA
- Invited speaker: Institute for Pure and Applied Mathematics (IPAM), March 2010, UCLA, USA
- Invited speaker: IGERT Joint Program in Applied Mathematics and the Earth and Environmental Sciences, February 2009, Columbia University, USA
- American Meteorological Society Graduate Fellowship
- American Meteorological Society Undergraduate Scholarship
- Member of American Meteorological Society, American Geophysical Union, European Geosciences Union
- Reviewer for NSF proposals (mail reviews), Monthly Weather Review, Weather and Forecasting, Journal of Atmospheric Science, Quarterly Journal of Royal Meteorological Society, Journal of Geophysical Research, Journal of Climate, Climate Dynamics, International Journal of Remote Sensing, Atmospheric Research, Journal of Applied Meteorology and Climatology
- Distinguished Speaker Selection Committee, University of Washington
- Student Athletes Choice Tutoring Award 2008
- Oceanographic field experiment forecaster, International Polar Year (IPY) NSF Freshwater Initiative (2006-2008), Davis Strait
- Outreach volunteer, Pacific Science Center, Seattle, WA
- Phi Kappa Phi, Phi Sigma Theta, Golden Key National Honors Societies, National Society for Collegiate Scholars, Chi Epsilon Pi Meteorological Honors Society

INTERESTS

Vortex dynamics, mesoscale numerical weather prediction, climate modeling, regional climate modeling, ensemble modeling and data assimilation, data and statistical analysis, atmospheric physics, synoptic meteorology, climate, climate change, renewable energy generation, planetary boundary layer processes, science communication

**PUBLICATIONS
AND PRESEN-
TATIONS**

Cavallo, S.M., and G.J. Hakim, 2013: Physical Mechanisms of Tropopause Polar Vortex Intensity Change. *J. Atmos. Sci.*, **70**, 3359-3373.

Cavallo, S.M., R.T. Torn, C. Snyder, C. Davis, W. Wang, and J. Done, 2012: Evaluation of the Advanced Hurricane WRF data assimilation system for the 2009 Atlantic hurricane season. *Mon. Wea. Rev.*, **141**, 523-541.

Cavallo, S.M., and G.J. Hakim, 2012: Radiative impact on tropopause polar vortices over the Arctic. *Mon. Wea. Rev.*, **140**, 1683-1702.

Cavallo, S.M., J. Dudhia, and C. Snyder, 2011: A multi-layer upper boundary condition for longwave radiative flux to correct temperature biases in a mesoscale model. *Mon. Wea. Rev.*, **139**, 1952-1959.

Cavallo, S.M., R. Torn, C. Davis, C. Snyder, W. Wang, and J. Done, 2010: Vortex structures from an ensemble-based data assimilation and hurricane prediction system during the 2009 Atlantic tropical cyclone season. Twenty-ninth Conference on Hurricanes and Tropical Meteorology, Tucson, AZ.

Davis, C. A., W. Wang, S. Cavallo, J. Done, J. Dudhia, S. Frederick, J. Michalakes, G. Caldwell, T. Engel, and R. Torn, 2010: High-resolution hurricane forecasts. *Computing in Science and Engineering*, IEEE Computer Society Digital Library. IEEE Computer Society, <http://doi.ieeecomputersociety.org/10.1109/MCSE.2010.74>

Cavallo, S.M., 2010: Understanding the intensification of tropopause polar vortices over the Arctic. Invited Speaker, IPAM Workshop for Equation Hierarchies for Climate Modeling, University of California, Los Angeles.

Cavallo, S.M., and G.J. Hakim, 2010: The composite structure of tropopause polar cyclones. *Mon. Wea. Rev.*, **138**, 3840-3857.

Cavallo, S.M., and G.J. Hakim, 2009: Potential vorticity diagnosis of a tropopause polar cyclone. *Mon. Wea. Rev.*, **4**, 1358-1371.

Cavallo, S.M. and G.J. Hakim, 2009: Vortex intensification of tropopause polar cyclones. American Meteorological Society 17th Conference on Atmospheric and Oceanic Fluid Dynamics, Stowe, VT.

Cavallo, S.M. 2009: Tropopause polar vortex characteristics and mechanisms of intensity change. Invited speaker, IGERT Colloquium, Columbia University.

Cavallo, S.M. and G.J. Hakim, 2008: The structure and dynamics of tropopause polar vortices. Fourteenth Extratropical Cyclone Workshop, Sainte-Adèle, Québec.

Cavallo, S.M. and G.J. Hakim, 2007: The dynamics of a tropopause polar cyclone. American Meteorological Society 16th Conference on Atmospheric and Oceanic Fluid Dynamics, Santa Fe, NM.

Cavallo, S.M. and G.J. Hakim, 2006: Analysis of the potential vorticity budget of a tropopause polar cyclone. Thirteenth Extratropical Cyclone Workshop, Monterey, CA.