

# MELISSA A. NIGRO

Department of Atmospheric and Oceanic Sciences  
University of Colorado at Boulder

## EDUCATION

Ph.D.	Atmospheric & Oceanic Sciences	University of Colorado, Boulder, CO	2012
M.S.	Atmospheric & Oceanic Sciences	University of Colorado, Boulder, CO	2010
M.B.A.	Masters of Business Administration	Union College, Schenectady, NY	2005
B.S.	Mechanical Engineering	Cornell University, Ithaca, NY	2002

## TEACHING POSITIONS

2014-present	Instructor, Department of Atmospheric and Oceanic Sciences, University of Colorado at Boulder, CO
2013	Guest Lecturer ATOC 5050: Introduction to Atmospheric Physics and Dynamics – University of Colorado at Boulder, CO
2011	Guest Lecturer ATOC 4750/5750: Desert Meteorology - University of Colorado at Boulder
2010	Grader ATOC 5050: Introduction to Atmospheric Physics and Dynamics – University of Colorado at Boulder, CO
2009-2010	Instructor MET 150: Introduction to General Meteorology, Front Range Community College Westminster, CO
2008-2009	Lead Graduate Teacher for the Department of Atmospheric and Oceanic Sciences, The Graduate Teacher Program, University of Colorado at Boulder
2007-2008	Teaching Assistant for ATOC 1070: Weather and the Atmosphere Laboratory, University of Colorado at Boulder, CO
2004-2005	Leadership Training Assistant, General Electric (GE) Crotonville Operations Management Leadership Program, Crotonville, NY

## PROFESSIONAL POSITIONS

2012-2016	Research Scientist, Cooperative Institute for Research in Environmental Sciences, Boulder, CO
2008-2012	Graduate Research Assistant, Department of Atmospheric and Oceanic Sciences, University of Colorado at Boulder, CO (Advisor: John J. Cassano)
2006	Operations Supervisor, GE Energy Schenectady, NY
2004-2006	Quality Process Engineer, GE Energy Schenectady, NY
2002-2004	Operations Management Leadership Program, GE Energy Schenectady, NY and Bangor, ME

## FIELD WORK

Fall 2014	Cooperative Institute for Research in Environmental Sciences Innovative Research Proposal – observed boundary layer at National Renewable Energy Laboratories, Boulder Atmospheric Observatory, and Pawnee National Grasslands using Small Unmanned Meteorological Observer
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- Winter 2014 National Science Foundation funded Automatic Weather Station Project – deep field camp to observe the boundary layer over the Ross Ice Shelf, Antarctica using Small Unmanned Meteorological Observer
- Winter 2011 National Science Foundation funded Automatic Weather Stations Project - installed and repaired automated weather stations in Antarctica
- Winter 2009 National Science Foundation funded Automatic Weather Stations Project - installed and repaired automated weather stations in Antarctica

## PUBLICATIONS

- Nigro, M.A.**, J.J. Cassano, J.D. Wille, D.H. Bromwich, and M.A. Lazzara, 2017: A Self-Organizing Map Based Evaluation of the Antarctic Mesoscale Prediction System Using Observations from a 30-m Instrumented Tower on the Ross Ice Shelf, Antarctica. *Weather Forecast*, **32**, 223-242, DOI:10.1175/WAF-D-16-0084.1.
- Wille, J.D., D.H. Bromwich, J.J. Cassano, **M.A. Nigro**, M.E. Mateling, and M.A. Lazzara, 2017: Evaluation of the AMPS Boundary Layer Simulations on the Ross Ice Shelf, Antarctica with Unmanned Aircraft Observations. *J. Appl. Meteorol. Clim.*, **56**, 2239-2258, DOI:10.1175/JAMC-D-16-0339.1.
- Cassano, J.J., **M.A. Nigro**, and M. Lazzara, 2016: Characteristics of the near-surface atmosphere over the Ross Ice Shelf, Antarctica. *J. Geophys. Res. Atmos.*, **121**, 3339-3362, doi:10.1002/2015JD024383.
- Fraser, A.D., **M.A. Nigro**, S.R.M. Ligtenberg, B. Legresy, M. Inoue, J.J. Cassano, P. Kuipers Munneke, J.T.M. Lenaerts, N.W. Young, A. Treverrow, M. Van Den Broeke, and H. Enomoto, 2016. Drivers of ASCAT C band backscatter variability in the dry snow zone of Antarctica. *J. Glaciol.*, **62**, 170-184, doi:10.1017/jog.2016.29.
- Wille, J.D., D.H. Bromwich, **M.A. Nigro**, J.J. Cassano, M. Mateling, M.A. Lazzara, and S. Wang, 2016: Evaluation of the AMPS Boundary Layer Simulations on the Ross Ice Shelf with Tower Observations. *J. Appl. Meteorol. Clim.*, **55**, 2349-2367, doi:10.1175/JAMC-D-160032.1.
- Nigro, M.A.**, and J.J. Cassano, 2014: Analysis of the Ross Ice Shelf Airstream Forcing Mechanisms Using Self Organizing Maps. *Mon. Wea. Rev.*, **142**, 4719-4734, doi:10.1175/MWR-D-14-00077.1.
- Nigro, M.A.**, and J.J. Cassano, 2014: Identification of Surface Wind Patterns over the Ross Ice Shelf, Antarctica Using Self Organizing Maps. *Mon. Wea. Rev.*, **142**, 2361-2378, doi:10.1175/MWR-D-13-00382.1.
- Nigro, M.A.**, J.J. Cassano, and S.L. Knuth, 2011: Evaluation of Antarctic Mesoscale Prediction System (AMPS) cyclone forecasts using infrared satellite imagery. *Antarctic Science*, **24**, 183-192, doi:10.1017/S0954102011000745.
- Nigro, M.A.**, J.J. Cassano, M.A. Lazzara and L.M. Keller, 2011: Case Study of a Barrier Wind Corner Jet Off the Coast of the Prince Olav Mountains, Antarctica. *Mon. Wea. Rev.*, **140**, 2044-2063.
- Nigro, M.A.**, J.J. Cassano, and M.W. Seefeldt, 2010: A weather pattern based approach to evaluate the Antarctic Mesoscale Prediction System (AMPS) forecasts: comparison to automatic weather station observations. *Wea. Forecasting*, **26**, 184-198, doi: 10.1175/2010WAF2222444.1.

## PRESENTATIONS

- Nigro, M.A.**, J.J. Cassano, M.W. Seefeldt, M.A. Lazzara, D.E. Mikolajczyk, L.J. Welhouse, C. Costanza, L.M. Keller, G.A. Weidner, 2015: Antarctic Atmospheric Observations: Automatic Weather Stations (AWS) and Small Unmanned Meteorological Observers (SUMO). Transantarctic Mountain Science, Loveland, CO.
- Nigro, M.A.**, J.J. Cassano, B. Jolly, and A. McDonald, 2014: Observations of the Summertime Boundary Layer over the Ross Ice Shelf, Antarctica Using SUMO UAVs (**invited**). American Geophysical Union, San Francisco, CA.

- Cassano, J.J., **M.A. Nigro**, L.M. Keller, M.A. Lazzara, J.E. Thom, G.A. Weidner, and L.J. Welhouse, 2014: Characteristics of the Atmospheric Surface Layer Over the Ross Ice Shelf. 9<sup>th</sup> Antarctic Meteorological Observation, Modeling and Forecasting Workshop, Charleston, SC.
- Mikolajczyk, D.E., M.A. Lazzara, L.J. Welhouse, L.M. Keller, J.E. Thom, G.A. Weidner, J.J. Cassano, and **M.A. Nigro**, 2014: The 2013-2014 Antarctic Automatic Weather Station Network Update: The Freewave and Iridium Networks Segment. 9<sup>th</sup> Antarctic Meteorological Observation, Modeling and Forecasting Workshop, Charleston, SC.
- Nigro, M.A.**, J.J. Cassano, B. Jolly, and A.J. McDonald, 2014: Observations of the Summertime Boulder Layer Over the Ross Ice Shelf, Antarctica using SUMO UAVs. 9<sup>th</sup> Antarctic Meteorological Observation, Modeling and Forecasting Workshop, Charleston, SC.
- Welhouse, L.J., M.A. Lazzara, D.E. Mikolajczyk, L.M. Keller, J.E. Thom, G.A. Weidner, J.J. Cassano, and **M.A. Nigro**, 2014: The 2013-2014 Antarctic Automatic Weather Station Network Update: The Freewave and Iridium Networks Segment. 9<sup>th</sup> Antarctic Meteorological Observation, Modeling and Forecasting Workshop, Charleston, SC.
- Nigro, M.A.**, and J.J. Cassano, 2013. Analysis of low-level winds over the Ross Ice Shelf, Antarctica: Barrier winds along the Transantarctic Mountains. 12th Conference on Polar Meteorology and Oceanography, American Meteorological Society, Seattle, WA.
- Nigro, M.A.**, and J.J. Cassano, 2013. Forcing Mechanisms of the Ross Ice Shelf Airstream. Antarctic Meteorological Observing, Modeling, and Forecasting Workshop, Madison, WI.
- Nigro, M.A.**, and J.J. Cassano, 2013. Observations of Vertical Temperature Profiles over the Ross Ice Shelf from the Alexander Tall Tower AWS. Antarctic Meteorological Observing, Modeling, and Forecasting Workshop, Madison, WI.
- Nigro, M.A.**, and J.J. Cassano, 2013. Poster: Atmospheric Dynamics in the Region of the Ross Ice Shelf, Antarctica. Transantarctic Mountains Science Meeting, Minneapolis, MN.
- Nigro, M.A.** and J.J. Cassano. 2012. What Drives the Low-Level Winds over the Ross Ice Shelf, Antarctica? International Polar Year 2012. Montreal, Canada.
- Nigro, M.A.** and J.J. Cassano. 2011. Case Study of a High Wind Event Off the Coast of the Prince Olav Mountains, Antarctica. Polar AMS. Boston, MA.
- Nigro, M.A.** and J.J. Cassano. 2010. An Analysis of the Low-Level Wind Field Over the Ross Ice Shelf, Antarctica. 5<sup>th</sup> Antarctic Meteorological Observation, Modeling, and Forecasting Workshop. Ohio State University.
- Richards, M.A.** and R. Takeshita. 2009. Teaching Science Labs. Graduate Teacher Program Intensive, University of Colorado at Boulder.

## POSTERS

- Nigro, M.A.**, D. Brown, A. Jahn, N. Lovenduski, J.K. Lundquist, and S. Chasteen, 2016: The Journey to a NEW ATOC Major: What do we want our students to learn? 8<sup>th</sup> Annual Symposium on STEM Education, Boulder, CO.
- Nigro, M.A.**, J.J. Cassano, J. Wille, D.H. Bromwich, and M.A. Lazzara. 2015: A Self-Organizing Map Based Evaluation of the Antarctic Mesoscale Prediction System Using Observations from a 30-m Instrumented Tower on the Ross Ice Shelf, Antarctica. American Geophysical Union, San Francisco, CA.
- de Boer, G., D. Lawrence, J. Elston, J. Cassano, J. Mack, N. Wildmann, **M. Nigro**, M. Ivey, D. Wolfe, and A. Muschinski, 2014: Estimating Surface Fluxes from Small Unmanned Aircraft: Evaluation of Current Abilities. American Geophysical Union, San Francisco, CA.
- Seefeldt, M.W., **M.A. Nigro**, and J.J. Cassano, 2014. Changes in the Atmospheric Circulation Across the Amundsen Sea Region in Relation to Changes in the West Antarctic Ice Sheet. American Geophysical Union, San Francisco, CA.

- Nigro, M.A.**, J.J. Cassano, B. Argrow, J. Elston, E. Frew, K. Friedrich, D. Lawrence, J. Lundquist, T. Nichols, and M. Rhodes, 2014. Poster: Observations of Wind Turbine Wakes Using Unmanned Aircraft Systems. Cooperative Institute for Research Environmental Sciences Innovative Research Program Poster Session, Boulder, CO.
- Nigro, M.A.** and J.J. Cassano. 2011. The Influence of Synoptic Forcing on the Path and Strength of the Ross Ice Shelf Air Stream, Antarctica. American Geophysical Union, San Francisco, CA.
- Nigro, M.A.** and J.J. Cassano. 2011. Case Study of a High Wind Event off the Coast of the Prince Olav Mountains, Antarctica, WRF Users' Workshop, Boulder, CO.
- Nigro, M.A.** and J.J. Cassano. 2010. Case Study of a High Wind Event over the Ross Ice Shelf, Antarctica, ATOC Poster Session, University of Colorado at Boulder.
- Richards, M.A.**, J. J. Cassano, and M. Seefeldt. 2009. A Weather Pattern Based Approach to Evaluate the Antarctica Mesoscale Prediction System (AMPS) Forecasts: Part 2. Comparison to Automatic Weather Station Observations, Polar American Meteorological Society, Madison, WI.
- Richards, M.A.** and J.J. Cassano. 2009. A Time Series Analysis of the Low-Level Winds Over the Ross Ice Shelf, ATOC Poster Session, University of Colorado at Boulder.

### **SCHOLARSHIPS AND AWARDS**

- 2018 Outstanding Service Award in ATOC for exceptional work and enthusiasm for undergraduate education, University of Colorado at Boulder, CO
- 2016 Fellow's Choice Award at the 8<sup>th</sup> Annual Symposium on STEM Education, University of Colorado at Boulder, CO
- 2011 Antarctic Service Medal, Department of Defense
- 2010 Academic Career in the Geosciences Workshop for Graduate Students and Post-Doctoral Fellows, funded by National Science Foundation, Stanford University, Stanford, CA
- 2010 United Government of Graduate Students Academic Travel Grant, University of Colorado at Boulder, CO
- 2008 Best Should Teach Silver Award, Graduate Teacher Program, University of Colorado at Boulder
- 2005 GE Management Power Award
- 2005 GE Honoring Quality Award
- 2002 GE Management Power Award
- 2002 Cornell William Fuerst Award

### **PROFESSIONAL DEVELOPMENT**

- 2009 Weather Research and Forecasting (WRF) Tutorial, National Center for Atmospheric Research, Boulder, CO
- 2008 Lead Network Training, Graduate Teacher Program, University of Colorado at Boulder

### **SERVICE ACTIVITIES**

- 2017-present Departmental Action Team focusing on creating an effective undergraduate community, Department of Atmospheric and Oceanic Sciences, University of Colorado at Boulder
- 2015-present Mentor for Promoting Geoscience Research, Education, and Success Program
- 2014-present Curriculum Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado at Boulder

- 2012-present Reviewer for International Journal of Climate, Monthly Weather Review, Journal of Applied Meteorology and Climatology, Boundary Layer Meteorology, and Journal of Climate
- 2016 ARPAC Committee
- 2015-2016 Transforming Education, Supporting Teaching and Learning Excellence (TRESTLE) Fellow, Department of Atmospheric and Oceanic Sciences University of Colorado at Boulder
- 2014-2015 Undergraduate Major Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado at Boulder
- 2012 & 2015 Transantarctic Mountains Camp Workshop organizational committee
- 2011 Organized APECS career panel at the Polar AMS conference
- 2009 Student member, Department of Atmospheric and Oceanic Sciences-INSTAAR joint hire search committee
- 2008-2009 Graduate student representative to Department of Atmospheric and Oceanic Science faculty
- 2008 Antarctic Science Outreach Program

**HONORS THESIS COMMITTEES**

- 2016 Natalie Tanski. Model for Lava Dam Removal Using a Sediment Flux Dependent Stream Power Model. Department of Geological Sciences Honors Thesis, University of Colorado at Boulder.