

July 2008

CURRICULUM VITAE

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EDUCATION

- 2004 Ph.D.** in Meteorology, University of Oklahoma, Norman, Oklahoma, USA.
Dissertation: “*The Effects of Wind Shear on Convective Boundary Layer Entrainment.*” Advisor: Evgeni Fedorovich.
- 1990 M.S.** in Meteorology, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA. *Thesis:* “Stratospheric behavior during tropospheric persistent anomaly events.” Advisors: Alan Plumb and Randall Dole.
- 1988 B.A.** in Chemistry, *Magna Cum Laude*, St. John’s University, Collegeville, Minnesota, USA.

EMPLOYMENT HISTORY

- 2005-present:** Senior Atmospheric Scientist, Windlogics, Inc., Grand Rapids, MN, USA.
- 2004-2005:** Post-Doctoral Fellow, Department of Atmospheric Science, Colorado State University, Fort Collins, Colorado, USA.
- 2000-2004:** Graduate Research Assistant, School of Meteorology, University of Oklahoma, Norman, Oklahoma, USA.
- 1999-2000:** Instructor in Meteorology, Department of Earth and Atmospheric Sciences, St. Cloud State University, St. Cloud, Minnesota, USA.
- 1998-1999:** Air Quality and Environmental Specialist, Labno Environmental, Inc., St. Paul, Minnesota, USA.
- 1996-1998:** Broadcast Meteorologist, KEYC television, Mankato, MN, USA.
- 1993-1996:** Air Quality Scientist, Barr Engineering, Inc., Minneapolis, MN, USA.
- 1990-1993:** Air Quality Meteorologist, ENSR Consulting and Engineering, Fort Collins, Colorado, USA.

WRITTEN PUBLICATIONS

Refereed Journal Articles:

- Conzemius, R. J., and E. Fedorovich, 2006a: Dynamics of sheared convective boundary layer entrainment. Part I: Methodological background and large eddy simulations. *J. Atmos. Sci.*, **63**, 1151-1178.
- Conzemius, R. J., and E. Fedorovich, 2006b: Dynamics of sheared convective boundary layer entrainment. Part II: Evaluation of bulk model predictions of entrainment flux. *J. Atmos. Sci.*, **63**, 1179-1199.
- Conzemius, R. J., and E. Fedorovich, 2007: Bulk models of the sheared convective boundary layer: evaluation through large eddy simulations. *J. Atmos. Sci.*, **64**, 786-807.
- Conzemius, R. J., and E. Fedorovich, 2008: A case study of convective boundary layer development during IHOP: numerical simulations compared to observations. *Mon. Wea. Rev.*, in press.
- Conzemius, R. J., R. W. Moore, M. T. Montgomery, and C. A. Davis, 2007: Mesoscale convective vortex formation in a weakly sheared moist neutral environment. *J. Atmos. Sci.*, **64**, 1443-1466.
- Fedorovich, E., Conzemius, R., and D. Mironov, 2004: Convective entrainment into a shear-free, linearly stratified atmosphere: bulk models reevaluated through large eddy simulations. *J. Atmos. Sci.*, **61**, 281-295.
- Fedorovich, E., and R. Conzemius, 2008: Effects of wind shear on the atmospheric convective boundary layer structure and evolution. *Acta Geophysica*, **56**, 114-141.
- Weiss, C. C., H. B. Bluestein, R. Conzemius, and E. Fedorovich, 2007: Variational pseudo-multiple-Doppler wind retrieval in the vertical plane for ground-based mobile radar data. *J. Atmos. Oceanic Technol.*, **24**, 1165-1185.

Conference Proceedings:

- Conzemius, R., and E. Fedorovich, 2001: Entrainment dynamics of shear-free convective boundary layers growing in linearly and discretely stratified fluids. *Proc. Third Intern. Symp. on Environmental Hydraulics*, 5-8 December 2001, Tempe, Arizona, USA, 6pp. (*ISEH2001 Abstracts*, 129).
- Conzemius, R., and E. Fedorovich, 2002: Dynamics of convective entrainment in a heterogeneously stratified atmosphere with wind shear. *Proc. 15th AMS Symp. on Boundary Layers and Turbulence*, 15-19 July 2002, Wageningen, the Netherlands, 31-34.

- Conzemius, R., and E. Fedorovich, 2003: Evolution of mean wind and turbulence fields in a quasi-baroclinic convective boundary layer with strong wind shears. *Proc. 11th Intern. Conf. on Wind Eng.*, 2-5 June 2003, Lubbock, Texas, USA, 2055-2062.
- Conzemius, R., and E. Fedorovich, 2003: Wind Shear Enhancement of Convective Boundary Layer Growth, *Proc. 23rd General Assembly of the International Union of Geodesy and Geophysics*, A.389.
- Conzemius R., and E. Fedorovich, 2004: Predictions of entrainment into a sheared atmospheric convective boundary layer by large eddy simulation versus two-parameter turbulence closure model. *Geophysical Research Abstracts*, **6**, 05343, 2004.
- Conzemius, R., and E. Fedorovich, 2004: Numerical models of entrainment into sheared convective boundary layers evaluated through large eddy simulations. Preprints, *16th Symp. on Boundary Layers and Turbulence*, Amer. Meteor. Soc., 9-13 August, Portland, Maine, USA, CD-ROM, 5.6.
- Conzemius, R., and E. Fedorovich, 2005: Essential features of entrainment in the sheared atmospheric convective boundary layer as represented by zero- and first-order bulk models. *Geophysical Research Abstracts*, **7**, 10265, 2005.
- Conzemius, R. J., 2006: Tests of transilient versus flux-gradient turbulence parameterizations for the prediction of surface layer wind profiles. Preprints, *17th Symp. on Boundary Layers and Turbulence*, Amer. Meteor. Soc., 22-26 May, San Diego, California, USA, CD-ROM, 9.3.
- Conzemius, R., and E. Fedorovich, 2008a: Simulations versus observations of a sheared convective boundary layer. *Abstr. Inaugural International Conference of the Engineering Mechanics Institute (EM08)*, May 18-21, 2008, University of Minnesota, Minneapolis, USA, p. 216.
- Conzemius, R., and E. Fedorovich, 2008b: Simulations versus observations of a sheared convective boundary layer. *Abstr. 18th AMS Symposium on Boundary Layers and Turbulence*, June 9-13, 2008, Stockholm, Sweden, P6.4.
- Fedorovich, E., and R. Conzemius, 2001: Large-eddy simulation of convective entrainment in linearly and discretely stratified fluids. *Direct and Large-Eddy Simulation IV*, B. J. Geurts et al., Eds., Kluwer, 435-442.
- Fedorovich, E., and R. Conzemius, 2002: Evolution of turbulent convective entrainment in heterogeneously versus linearly stratified fluids. *Advances in Turbulence IX*, I. Castro et al., Eds., CIMNE Publication, Barcelona, Spain, 457-460.
- Fedorovich, E., and R. Conzemius, 2002: Effects of initial temperature and velocity perturbations on the development of convection in the atmospheric boundary layer.

Proc. 15th AMS Symp. on Boundary Layers and Turbulence, 15-19 July 2002, Wageningen, the Netherlands, 39-42.

Fedorovich, E., and R. Conzemius, 2004: Numerical evaluation of wind-shear effects on turbulence regime and entrainment dynamics in the atmospheric convective boundary layer. *Geophysical Research Abstracts*, **6**, 05370, 2004.

Fedorovich, E., R. Conzemius, I. Esau, F. Katopodes Chow, D. Lewellen, C.-H. Moeng, D. Pino, P. Sullivan, and J. Vilà-Guerau de Arellano, 2004: Entrainment into sheared convective boundary layers as predicted by different large eddy simulation codes. Preprints, *16th Symp. on Boundary Layers and Turbulence*, Amer. Meteor. Soc., 9-13 August, Portland, Maine, USA, CD-ROM, P4.7.

Fedorovich, E., R. Conzemius, and A. Shapiro, 2004: Nonstationarity of convective boundary layer growth in a heterogeneously stratified, shear-free atmosphere. Preprints, *16th Symp. On Boundary Layers and Turbulence*, Amer. Meteor. Soc., 9-13 August, Portland, Maine, USA, CD-ROM, 7.9.

Fedorovich, E., and R. Conzemius, 2005: Velocity scales associated with different entrainment-contributing mechanisms in the sheared atmospheric convective boundary layer. *Geophysical Research Abstracts*, **7**, 09821, 2005.

Fedorovich, E., and R. Conzemius, 2008: Numerical simulation and parameterization of entrainment into sheared convective boundary layers. *Abstr. Inaugural International Conference of the Engineering Mechanics Institute (EM08)*, May 18-21, 2008, University of Minnesota, Minneapolis, USA, p. 242.

PRESENTATIONS GIVEN

Conference presentations:

December 5-8, 2001: Third International Symposium on Environmental Hydraulics (ISEH2001), Tempe, Arizona, USA. Title: "Entrainment dynamics of shear-free convective boundary layers growing in linearly and discretely stratified fluids" (w. E. Fedorovich).

July 2-5, 2002 Ninth European Turbulence Conference (ETC9), Southampton, U.K. Title: "Evolution of turbulent convective entrainment in heterogeneously versus linearly stratified fluids" (w. E. Fedorovich).

July 15-19, 2002: 15th AMS Symposium on Boundary Layers and Turbulence (BLT15), Wageningen, the Netherlands. Title: "Dynamics of convective entrainment in a heterogeneously stratified atmosphere with wind shear" (w. E. Fedorovich).

- June 2-5, 2003:** 11th International Conference on Wind Engineering (ICWE11), Lubbock, Texas, USA. Title: “Evolution of mean wind and turbulence fields in a quasi-baroclinic convective boundary layer with strong wind shears” (w. E. Fedorovich).
- June 30-July 11, 2003:** 23rd General Assembly of the International Union of Geodesy and Geophysics (IUGG2003), Sapporo, Japan. Title: “Wind Shear Enhancement of Convective Boundary Layer Growth” (w. E. Fedorovich).
- August 9-13, 2004:** 16th AMS Symposium on Boundary Layers and Turbulence (BLT16), Portland, Maine, USA. Title: “Numerical models of entrainment into sheared convective boundary layers evaluated through large eddy simulations” (w. E. Fedorovich).
- April 24-29, 2005:** European Geosciences Union (EGU), Vienna, Austria. Title: “Velocity scales associated with different entrainment-contributing mechanisms in the sheared atmospheric convective boundary layer.” (w. E. Fedorovich).
- May 22-26, 2006:** 17th AMS Symposium on Boundary Layers and Turbulence (BLT17), San Diego, California, USA. Title: “Tests of transilient versus flux-gradient turbulence parameterizations for the prediction of surface layer wind profiles”.
- May 7-10, 2007:** 2007 European Wind Energy Conference, Milan, Italy (EWEC 2007). Title: “Recent Improvements to the Boundary Layer Parameterization in the MM5 Mesoscale Model”.
- May 3-6, 2007:** 2007 American Wind Energy Association Conference, Los Angeles, California, USA (Windpower 2007). Title: “Tuning Numerical Weather Prediction Models to Predict Hub Height Wind Speeds”.
- May 18-21, 2008:** *Inaugural International Conference of the Engineering Mechanics Institute (EM08)*. Title: “Simulations versus observations of a sheared convective boundary layer”. (w. E. Fedorovich).
- June 9-13, 2008:** 18th AMS Symposium on Boundary Layers and Turbulence (BLT18), Stockholm, Sweden. Title: “Tests of RANS-based PBL Schemes Against LES, RUC, and Tall Tower Data”. (w. D. Moon); and “Simulations versus observations of a sheared convective boundary layer.” (w. E. Fedorovich).

Seminars:

- October 2001:** School of Meteorology, University of Oklahoma, Norman, Oklahoma, USA. Title: "Large Eddy Simulation of Convective Entrainment in Linearly and Discretely Stratified Fluids" (with E. Fedorovich).
- March 2003:** National Center for Atmospheric Research, Boulder, Colorado, USA. Title: "Wind Shear Enhancement of Convective Boundary Layer Entrainment" (with E. Fedorovich).
- April 2003:** School of Meteorology, University of Oklahoma, Norman, Oklahoma, USA. Title: "Wind Shear Enhancement of Convective Boundary Layer Entrainment" (with E. Fedorovich).
- March 2004:** School of Meteorology, University of Oklahoma, Norman, Oklahoma, USA. Title: "Dynamics of Sheared Convective Boundary Layer Entrainment as Reproduced with Various Numerical Models".
- January 2005:** Department of Atmospheric Science, Colorado State University, Fort Collins, Colorado, USA. Title: "The Dynamics of Sheared Convective Boundary Layer Entrainment as Reproduced by Large Eddy Simulations".
- August 2005:** Department of Atmospheric Science, University of Northern Colorado, Greeley, Colorado, USA. Title: "Formation of mesoscale convective vortices in shear".
- November 2007:** Department of Civil Engineering, University of Minnesota, Minneapolis, Minnesota, USA. Title: "Using Large Eddy Simulations to Improve Wind Energy Resource Assessments and Forecasts".

SCIENTIFIC PROJECTS

Project "Dynamics of convective entrainment in heterogeneously stratified atmosphere with wind shears". Funding agency: National Science Foundation, USA. Grant ATM-0124068. Location: University of Oklahoma, USA. Function: assistant investigator. Duration: from January 2002 to December 2004. Budget: US\$ 270K.

Project "A Theoretical and Observational Study of Midlatitude Mesoscale Convective Vortices (MCVs) in Vertical Shear". Funding agency: National Science Foundation, USA. Grant ATM-0305412. Location: Colorado State University, USA. Function: assistant investigator. Duration: from December 2004 to present. Budget: US\$ 429K.

FIELD EXPERIMENTS

2002, May-June. International H₂O Project (IHOP). Extensive field experiment to study boundary layer heterogeneity, convection initiation, and quantitative precipitation estimation in the central and southern plains of the U.S. Responsibilities: ground systems coordinator, nowcasting.

2001,2003 May-June. Radar Observations of Tornadoes and Thunderstorms Experiment (ROTATE). Responsibilities: scout vehicle navigator, driver, forecasting, nowcasting.

2004 September. Hurricanes at Landfall (HAL) 2004. Experiment designed to study the boundary layer wind structures in land-falling hurricanes. Responsibilities: forecaster, driver.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

1993-1996: Air and Waste Management Association (AWMA)

1989-present: American Meteorological Society (AMS). President of Twin Cities (Minnesota) Chapter from 1995-1997.

LANGUAGES

English: native language; **German:** basic skills.

SERVICE

Geosciences Technical Advisory Committee: Graduate Student Representative in Meteorology (2002-2004)

Bel-Aire Addition Association (homeowner's association): Secretary/Treasurer (2001-2004)

TEACHING

1999-2000: St. Cloud State University, St. Cloud, Minnesota, USA

Undergraduate courses taught:

Introduction to Meteorology (for majors), Fall 1999, Spring and Summer 2000;

Introduction to Forecasting, Fall 1999;

Introduction to Earth Sciences (for non-majors), Fall 1999;

Broadcast Meteorology, Spring 2000;

Micrometeorology, Spring 2000.

SCHOLARSHIPS AND AWARDS

Presidential International Travel Award Fellowship, Summer 2003

Douglas Lilly Award for best Ph.D. dissertation publication, April 2005