

## ROBERT X. BLACK

### Associate Professor

*School of Earth and Atmospheric Sciences  
Georgia Institute of Technology, Atlanta, GA 30332-0340  
phone: (404) 894-1756  
fax: (404) 894-5638  
rob.black@eas.gatech.edu*

#### I. EARNED DEGREES

Ph.D. Meteorology	1990	Massachusetts Institute of Technology
B.S. Meteorology	1984	McGill University

#### II. EMPLOYMENT HISTORY

Associate Professor	Georgia Tech	2002-present
Senior Research Scientist	Georgia Tech	1999-2002
“Adjunct Star” EAS Faculty Appointment	Georgia Tech	1994-2002
Research Scientist II	Georgia Tech	1993-1999
Senior Research Associate	AER, Inc.	1991-1993
Postdoctoral Research Associate	MIT	1990-1991
Graduate Research Assistant	MIT	1984-1990

#### III. HONORS, AWARDS AND RECOGNITIONS

2016 National Champion, WxChallenge Collegiate Weather Forecasting Competition.  
2013 6<sup>th</sup> Place (Overall), 2<sup>nd</sup> Place among faculty, WxChallenge Competition.  
2012 7<sup>th</sup> Place (Overall), 3<sup>rd</sup> Place among faculty, WxChallenge Competition.  
2008 National Champion, WxChallenge Collegiate Weather Forecasting Competition.  
2002 Top Ten journal article of American Meteorological Society  
1998 Sigma Xi Young Faculty Award, Georgia Institute of Technology.  
1987 Victor P. Starr Prize, Massachusetts Institute of Technology.  
1984 Howard H. Hanks Jr. Scholarship, American Meteorological Society.  
1984 University Scholar with Great Distinction, McGill University.  
1983 GISS/Lamont-Doherty Summer Fellowship.

#### IV. RESEARCH, SCHOLARSHIP AND CREATIVE ACTIVITIES

##### A. REFEREED PUBLICATIONS AND SUBMISSIONS (STUDENTS/POSTDOCS IN **BOLD**)

- \***Zhao, S.**, Y. Deng, and R. X. Black, 2018: Observed and Simulated Spring and Summer Dryness in the United States: The Impact of the Pacific Sea Surface Temperature and Beyond. *J. Geophys. Res. Atmos.*, (in press) doi:10.1002/2017JD027279.
- \***Xie, Z.**, R. X. Black, and Y. Deng, 2017: Daily-Scale Planetary Wave Patterns and the Modulation of Cold Season Weather in the Northern Extratropics, *J. Geophys. Res. Atmos.*, **122**, 8383–8398, doi:10.1002/2017JD026768.

- \***Xie Z.**, R. X. Black, and Y. Deng, 2017: The Structure and Large-Scale Organization of Extreme Cold Waves over the Conterminous United States. *Clim. Dyn.* **49**, 4075–4088, doi:10.1007/s00382-017-3564-6.
- \***Zhao, S.**, Y. Deng; and R. X. Black, 2017: A Dynamical and Statistical Characterization of United States Extreme Precipitation Events and their Associated Large-Scale Meteorological Patterns. *J. Climate*, **30**, 1307-1326.
- \***He, J.** and R. X. Black, 2016: Heat Budget Analysis of Northern Hemisphere High-latitude Spring Onset Events. *J. Geophys. Res.* **121**, 10,113–10,137.
- \***Zhao, S.**, Y. Deng, and R. X. Black, 2016: Warm Season Dry Spells in the Central and Eastern United States: Diverging Skill in Climate Model Representation. *J. Climate*, **29**, 5617-5624.
- \*R. Grotjahn, R.X. Black, R. Leung, M.F. Wehner, M. Barlow, M. Bosilovich, A. Gershunov, W.J. Gutowski Jr., J.R. Gyakum, R.W. Katz, Y-Y. Lee, Y.-K. Lim, Prabhat, 2016: North American Extreme Temperature Events and Related Large Scale Meteorological Patterns: A Review of Statistical Methods, Dynamics, Modeling, and Trends. *Clim. Dyn.*, **46**, 1151-1184.
- \***Westby, R.**, and R.X. Black, 2015: Development of Anomalous Temperature Regimes over the Southeastern United States: Synoptic Behavior and Role of Low-Frequency Modes. *Wea. Forecasting*, **30**, 553–570. <http://dx.doi.org/10.1175/WAF-D-14-00093.1>
- \***He, J.**, and R.X. Black, 2015: Characterizing Arctic spring onset. *J. Climate*, **28**, 4471–4489. <http://dx.doi.org/10.1175/JCLI-D-14-00593.1>
- \***Lee, Y-Y.**, and R.X. Black, 2015: The Structure and Dynamics of the Stratospheric Northern Annular Mode in CMIP5 Simulations. *J. Climate*, **28**, 86-107.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/lee\\_black\\_2015.pdf](http://rxb.eas.gatech.edu/papers/lee_black_2015.pdf))
- \*Manzini, E., A.Y. Karpechko, J. Anstey, M.P. Baldwin, R.X. Black, C. Cagnazzo, N. Calvo, A. Charlton-Perez, B. Christiansen, P. Davini, E. Gerber, M. Giorgetta, L. Gray, S.C. Hardiman, **Y.-Y. Lee**, D.R. Marsh, B.A. McDaniel, A. Purich, A.A. Scaife, D. Shindell, S.-W. Son, S. Watanabe and G. Zappa, 2014: Role of the stratosphere in Northern winter climate change as simulated by the CMIP5 models. *J. Geophys. Res.*, **119**, 7979–7998.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/manzini\\_etal\\_2014.pdf](http://rxb.eas.gatech.edu/papers/manzini_etal_2014.pdf))
- \*Hegyi, B., Y. Deng, R. Black, and R. Zhou, 2014: Initial and transient response of the winter polar stratospheric vortex to idealized equatorial Pacific sea surface temperature forcing in the NCAR WACCM model. *J. Climate*, **27**, 2699–2713.
- \***Lee, Y-Y.**, and R.X. Black, 2013: Boreal Low Frequency Variability in CMIP5 models. *J. Geophys. Res.*, **118**, 6891-6904, doi: 10.1002/jgrd.50493.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/lee\\_black\\_2013.pdf](http://rxb.eas.gatech.edu/papers/lee_black_2013.pdf))
- \***Westby, R.M., Y-Y. Lee** and R.X. Black, 2013: Anomalous Temperature Regimes during the Cool Season: Long-term Trends, Low Frequency Mode Modulation and Representation in CMIP5 Simulations. *J. Climate*, **26**, 9061–9076.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/westby\\_lee\\_black\\_2013.pdf](http://rxb.eas.gatech.edu/papers/westby_lee_black_2013.pdf))

- \*Charlton-Perez, A.J. M.P. Baldwin, T. Birner, R.X. Black, A.H. Butler, N. Calvo, N.A. Davis, E.P. Gerber, N. Gillett, S. Hardiman, J. Kim, K. Kruger, **Y.-Y. Lee**, E. Manzini, B.A. McDaniel, L. Polvani, T. Reichler, T.A. Shaw, M. Sigmond, S.-W. Son, M. Toohey, L. Wilcox, S. Yoden, B. Christiansen, F. Lott, D. Shindell, S. Yukimoto, and S. Watanabe, 2013: On the lack of stratospheric dynamical variability in low-top versions of CMIP5 models. *J. Geophys. Res.*, **118**, 2494-2505, doi: 10.1002/jgrd.50125.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/charlton-perez\\_etal\\_2013.pdf](http://rxb.eas.gatech.edu/papers/charlton-perez_etal_2013.pdf))
- \*Black, R.X., B.A. McDaniel, and **Y.-Y. Lee**, 2012: The structure, dynamics and tropospheric signature of the Polar Annular Mode. *J. Geophys. Res.*, **117**, D19115, doi:10.1029/2012JD017900.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/black\\_mcdaniel\\_lee\\_2012.pdf](http://rxb.eas.gatech.edu/papers/black_mcdaniel_lee_2012.pdf))
- \*Black, R.X., and B.A. McDaniel, 2009: Sub-monthly polar vortex variability and stratosphere-troposphere coupling in the Arctic. *J. Climate*, **22**, 5886-5901.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/black\\_mcdaniel\\_2009.pdf](http://rxb.eas.gatech.edu/papers/black_mcdaniel_2009.pdf))
- \*Black, R.X., and **B.A. McDaniel**, 2007: The dynamics of Northern Hemisphere stratospheric warming events. *J. Atmos. Sci.*, **64**, 2932-2946.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/black\\_mcdaniel\\_2006b.pdf](http://rxb.eas.gatech.edu/papers/black_mcdaniel_2006b.pdf))
- \*Black, R.X., and **B.A. McDaniel**, 2007: Interannual variability in the Southern Hemisphere circulation organized by stratospheric final warming events. *J. Atmos. Sci.*, **64**, 2968-2975.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/black\\_mcdaniel\\_2006a.pdf](http://rxb.eas.gatech.edu/papers/black_mcdaniel_2006a.pdf))
- \*Black, R.X., **B.A. McDaniel**, and W.A. Robinson, 2006: Stratosphere-Troposphere coupling during spring onset. *J. Climate*, **19**, 4891-4901.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/black\\_mcdaniel\\_robinson.pdf](http://rxb.eas.gatech.edu/papers/black_mcdaniel_robinson.pdf))
- \***Robinson, D.P.**, R.X. Black, and **B.A. McDaniel**, 2006: A Siberian precursor to midwinter intraseasonal variability in the North Pacific storm track. *Geophys. Res. Lett.*, **33**, L15811, doi:10.1029/2006GL026458.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/robinson\\_black\\_mcdaniel.pdf](http://rxb.eas.gatech.edu/papers/robinson_black_mcdaniel.pdf))
- \***Robinson, D.P.**, and R.X. Black, 2006: Baroclinic development in observations and General Circulation Models. *Mon. Wea. Rev.*, **134**, 1161-1173.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/robinson\\_black\\_mwr2005.pdf](http://rxb.eas.gatech.edu/papers/robinson_black_mwr2005.pdf))
- \***McDaniel, B.A.**, and R.X. Black, 2005: Intraseasonal dynamical evolution of the Northern Annular Mode. *J. Climate*, **18**, 3820-3839.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/mcdaniel\\_black\\_2005.pdf](http://rxb.eas.gatech.edu/papers/mcdaniel_black_2005.pdf))
- \***Robinson, D.P.**, and R.X. Black, 2005: The statistics and structure of subseasonal variability in NASA/GSFC GCMs. *J. Climate*, **18**, 3294-3316.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/robinson\\_black\\_2005.pdf](http://rxb.eas.gatech.edu/papers/robinson_black_2005.pdf))
- \*Black, R.X., and **B.A. McDaniel**, 2004: Diagnostic case studies of the Northern Annular Mode. *J. Climate*, **17**, 3990-4004.  
(Manuscript: [http://rxb.eas.gatech.edu/papers/black\\_mcdaniel\\_2004.pdf](http://rxb.eas.gatech.edu/papers/black_mcdaniel_2004.pdf))
- \***Evans, K.J.** and R.X. Black, 2003: Piecewise tendency diagnosis of weather regime transitions. *J. Atmos. Sci.*, **60**, 1941-1959.

(Manuscript: [http://rxb.eas.gatech.edu/papers/evans\\_black\\_2003.pdf](http://rxb.eas.gatech.edu/papers/evans_black_2003.pdf))

- \*Black, R.X., 2002: Stratospheric forcing of surface climate in the Arctic Oscillation. *J. Climate*, **15**, 268-277.
- \*Black, R.X., and R.M. Dole, 2000: Storm tracks and barotropic deformation in climate models. *J. Climate*, **13**, 2712-2728.
- \*Black, R.X., 1998: The maintenance of extratropical intraseasonal transient eddy activity in the GEOS-1 assimilated dataset. *J. Atmos. Sci.*, **55**, 3159-3175.
- \*Black, R.X., and **K.J. Evans**, 1998: The statistics and horizontal structure of anomalous weather regimes in the Community Climate Model. *Mon. Wea. Rev.*, **126**, 841-859.
- \*Hartley, D.E., J. Villarin, R.X. Black, and C.A. Davis, 1998: A new perspective on the dynamical link between the stratosphere and troposphere. *Nature*, **391**, 471-474.
- \*Black, R.X., 1997: Deducing anomalous wave source regions during the life cycles of persistent flow anomalies. *J. Atmos. Sci.*, **54**, 895-907.
- \*Black, R.X., D.A. Salstein, and R.D. Rosen, 1996: Interannual modes of variability in atmospheric angular momentum. *J. Climate*, **9**, 2834-2849.
- \*Hartley, D.E., and R.X. Black, 1995: Mechanistic analysis of interhemispheric transport. *Geophys. Res. Lett.*, **22**, 2945-2948.
- Black, R.X., and R.M. Dole, 1993: The dynamics of large-scale cyclogenesis over the North Pacific Ocean. *J. Atmos. Sci.*, **50**, 421-442.
- Dole, R.M., and R.X. Black, 1990: Life cycles of persistent anomalies. Part II: The development of persistent negative height anomalies over the North Pacific Ocean. *Mon. Wea. Review*, **118**, 824-846.

## **B. OTHER PUBLICATIONS AND CREATIVE PRODUCTS (not refereed)**

- Grotjahn, R., M. Barlow, R. Black, T. Cavazos, W. Gutowski, J. Gyakum, R. Katz, A. Kumar, L-Y. Leung, R. Schumacher, M. Wehner, 2014: US CLIVAR workshop on analyses, dynamics, and modeling of large-scale meteorological patterns associated with extreme temperature and precipitation events. US CLIVAR Report 2014-2, US CLIVAR Project Office, Washington, DC, 42 pp.  
([https://usclivar.org/sites/default/files/documents/2014/2013\\_Extremes\\_Workshop\\_Report.pdf](https://usclivar.org/sites/default/files/documents/2014/2013_Extremes_Workshop_Report.pdf))
- Black, R.X., R.M. Westby and Y.-Y. Lee 2014: The Low Frequency Modulation of Anomalous Temperature Regimes during Winter. *U.S. CLIVAR Variations*, **Vol. 12**, No. 1, 13-16. (Paper at: <http://www.usclivar.org/sites/default/files/documents/2014/Variations-winter-2014-v3.pdf>)
- Black, R.X., and B.A. McDaniel, 2003: Stratosphere-troposphere interactions: Case studies of the NAM. *Bull. Amer. Meteor. Soc.*, **84**, 900.
- Black, R.X., D.P. Robinson, and B.A. McDaniel, 2002: Assessment of midlatitude subseasonal variability in NASA/GSFC General Circulation Models, *Workshop Proceedings, Workshop on Prospects for Improved Forecasts of Weather and Short-term Climate Variability on Subseasonal (2 Week to 2 Month) Time Scales*. NASA/Goddard Space Flight Center, 159-162.

- Black, R.X., and D.P. Robinson, 2002: Diagnostic analyses of short-term climate variability in NASA/GSFC general circulation models, *Preprint Volume, 13<sup>th</sup> Symposium on Global Change and Climate Variations*, 222.
- Black, R.X., 2002: A stratospheric influence on Northern Hemisphere climate. *Bull. Amer. Meteor. Soc.*, **83**, 174.
- McDaniel, B.A, and R.X. Black, 2001: Stratosphere-Troposphere Coupling During Intraseasonal Variations in the Arctic Oscillation, *Preprint Volume, 13<sup>th</sup> Conference on Atmospheric and Ocean Fluid Dynamics*, 256-257.
- Black, R.X., 2001: Stratospheric-Troposphere Interactions During Intraseasonal Variations in the Arctic Oscillation, *Proceedings of the 25th Climate Diagnostics and Prediction Workshop*. US Dept. of Commerce/NOAA, 27-30.
- Black, R.X., 2000: Stratospheric forcing of tropospheric climate: Potential vorticity inversions of the Arctic Oscillation, *Proceedings of the 24th Climate Diagnostics and Prediction Workshop*. US Dept. of Commerce/NOAA, 252-255.
- Black, R.X., and M.P. Baldwin, 1999: Potential vorticity inversions of the Arctic Oscillation: Stratospheric forcing of tropospheric climate?. *EOS Transactions, AGU*, **80**, F241.
- Evans, K.J., and R.X. Black, 1999: Piecewise tendency diagnosis of weather regime transitions, *Preprint Volume, 12<sup>th</sup> Conference on Atmospheric and Ocean Fluid Dynamics*, 268-272.
- Black, R.X., 1999: Storm track dynamics in atmospheric models: The impact of barotropic deformation, *Preprint Volume, 12<sup>th</sup> Conference on Atmospheric and Ocean Fluid Dynamics*, 143-147.
- Black, R.X., 1998: Potential vorticity-based diagnoses of the general circulation from reanalysis datasets. *Proceedings of the First World Climate Research Program International Conference on Reanalyses*. NOAA/NASA/NSF/WMO, 25-28.
- Black, R.X., 1997: Potential enstrophy budgets in assimilated datasets: Uncertainties in the sources of synoptic eddy activity. *Proceedings of the 21st Climate Diagnostics and Prediction Workshop*. US Dept. of Commerce/NOAA, 199-202.
- Black, R.X., and K.J. Evans 1997: Piecewise tendency diagnosis: Quantifying the sources for regime transition. *Preprint Volume, 11th Conference on Atmospheric and Oceanic Fluid Dynamics*. American Meteorological Society, 282-284.
- Black, R.X., 1997: Potential enstrophy analyses of synoptic-scale eddies. *Preprint Volume, 11th Conference on Atmospheric and Oceanic Fluid Dynamics*. American Meteorological Society, 150-152.
- Black, R.X., 1996: Tropical-extratropical interaction during regime transition in GCM simulations. *Preprint Volume, Conference on the Global Ocean-Atmosphere-Land System*. American Meteorological Society, 341.
- Black, R.X., 1996: The maintenance of intraseasonal transient eddy activity in the GEOS-1 assimilated data set. *Proceedings of the 20th Annual Climate Diagnostics Workshop*. U.S. Dept. of Commerce/NOAA, 176-179.
- Hartley, D.E., and R.X. Black, 1995: Preferred longitudinal regions of tropical/ midlatitude mixing in the troposphere and lower stratosphere, *EOS Transactions, AGU*, **76**, F128.
- Black, R.X., R.M. Dole, and J.S. Whitaker, 1995: Potential vorticity-based diagnoses of seasonal and intraseasonal variability in an assimilated dataset. *Workshop Proceedings, Workshop on Results from the GEOS-1 Five-Year Assimilation*. NASA/Goddard Space Flight Center, 85-87.
- Black, R.X., 1995: Weather regime transitions in the CCM2. Part I: Model validation. *Preprint*

- Volume, Tenth Conference on Atmospheric and Oceanic Waves and Stability.* American Meteorological Society, 162-163.
- Hartley, D.E., and R.X. Black, 1994: Interhemispheric transport: A new perspective on the dynamical mechanisms. *EOS Transactions*, AGU, **75**, F136.
- Black, R.X., 1994: Large-scale cyclogenesis in a general circulation model. *Preprint Volume, International Symposium on the Life Cycles of Extratropical Cyclones.* American Meteorological Society, NOAA, ONR, and NSF, 128-133.
- Black, R.X., 1993: Diagnosing the seasonal climate of NASA/Goddard's GEOS GCM. *Proceedings of the 18th Annual Climate Diagnostics Workshop.* U.S. Dept. of Commerce/ NOAA, 236-241.
- Black, R.X., 1993: Deducing the source regions for persistent flow anomalies. *Workshop Proceedings, Workshop on Numerical Extended Range Weather Prediction.* NSF and U.S. Dept. of Commerce/NOAA, 32-37.
- Black, R.X., 1993: Deducing the source regions for persistent flow anomalies. *Preprint Volume, Ninth Conference on Atmospheric and Oceanic Waves and Stability.* American Meteorological Society, 440-443.
- Salstein, D.A., R.X. Black and R.D. Rosen, 1993: Interannual variations in angular momentum from a rawinsonde-based climate data set. *Preprint Volume, Fourth Symposium on Global Change.* American Meteorological Society, 339-344.
- Black, R.X., 1992: Validating seasonal and intraseasonal wave activity in GLA GCM's and data assimilations. *Proceedings of the 17th Annual Climate Diagnostics Workshop.* University of Oklahoma, U.S. Dept. of Commerce/ NOAA, 236-241.
- Black, R.X., and R.M. Dole, 1991: Diagnosing the sources for persistent flow anomaly development. *Preprint Volume, Ninth Conference on Numerical Weather Prediction.* American Meteorological Society, 520-523.
- Black, R.X., and R.M. Dole, 1991: Large-scale cyclogenesis over the North Pacific Ocean. *Preprint Volume, First International Winter Storm Symposium.* American Meteorological Society, 34-39.
- Dole, R.M., and R.X. Black, 1988: Persistent large-scale flow anomalies: Characteristics of developments. *Annales Geophysicae*, **6**, 101-102.
- Dole, R.M., and R.X. Black, 1988: Large-scale cyclogenesis. *Palmen Memorial Symposium on Extratropical Cyclones and Their Role in the General Circulation of the Atmosphere.* American Meteorological Society, 140-143.

### C. CONFERENCE ABSTRACTS

- Zhao, S., Y. Deng, and R. X. Black, A Dynamical and Statistical Characterization of United States Hydrological Extremes and their Associated Large-Scale Meteorological Patterns. 2016 AGU Fall Meeting, San Francisco.  
(Abstract at: <https://agu.confex.com/agu/fm16/meetingapp.cgi/Paper/143749>)
- Xie Z., R. X. Black, and Y. Deng, The Structure and Large-Scale Organization of Extreme Cold Waves over the Conterminous United States. 2016 AGU Fall Meeting, San Francisco.  
(Abstract at: <https://agu.confex.com/agu/fm16/meetingapp.cgi/Paper/141765>)
- Xie Z., R. X. Black, and Y. Deng, Daily Planetary Wave Patterns and Their Weather Impact during the Boreal Cool Season. 2016 Regional and Global Climate Modeling (RGCM) PI Meeting, Washington DC.

- Black, R.X. and R. Westby 2016: The Self-Regulated Induction of United States Cold Air Outbreaks by the North Atlantic Oscillation. 28th Conference on Climate Variability and Change, American Meteorological Society.  
(Abstract at: <https://ams.confex.com/ams/96Annual/webprogram/Paper282962.html>)
- Black, R.X. and R. Westby 2015: The Self-Regulated Induction of United States Cold Air Outbreaks by the North Atlantic Oscillation. 47<sup>th</sup> Annual Fall Meeting, American Geophysical Union.  
(Abstract at: <https://agu.confex.com/agu/fm15/meetingapp.cgi/Paper/78873> )
- Black, R.X, T-W. Park, and Y. Deng 2015: Characterizing the Structure and Behavior of Extreme Weather Events over the United States. Joint Assembly, AGU-GAC.  
(Abstract at: <https://agu.confex.com/agu/ja2015/meetingapp.cgi/Paper/35885> )
- Black, R.X., Y. Deng, K. Evans, Y.-Y. Lee, T.-W. Park and R.M. Westby 2014: The Weather-Climate Nexus: Large-Scale Organization of Extreme Events. Department of Energy Climate and Earth System Modeling Principal Investigator's Meeting.  
(Abstract at: <http://climatemodeling.science.energy.gov/presentations/weather-climate-nexus-large-scale-organization-extreme-events>)
- He, J., and R.X. Black 2014: Characteristics of Arctic Spring Onset. 47<sup>th</sup> Annual Fall Meeting, American Geophysical Union.  
(Abstract at: <https://agu.confex.com/agu/fm14/meetingapp.cgi#Paper/27658>)
- He, J., and R.X. Black 2014: A Synoptic Analysis of Rapid Surface Warming during Arctic Spring Onset. 26<sup>th</sup> Conference on Climate Variability and Change, American Meteorological Society.  
(Abstract at: <https://ams.confex.com/ams/94Annual/webprogram/Paper234382.html>)
- Westby, R.M. and R.X. Black 2014: Anomalous Temperature Regimes during the Cool Season: Triggers and Physical Connections to Low Frequency Modes. 26<sup>th</sup> Conference on Climate Variability and Change, American Meteorological Society.  
(Abstract at: <https://ams.confex.com/ams/94Annual/webprogram/Paper232945.html>)
- He, J. and R.X. Black 2013: A Study of the Extratropical Baroclinic Eddy Activity during Arctic Spring Onset. 46<sup>th</sup> Annual Fall Meeting, American Geophysical Union. (Abstract at: <http://abstractsearch.agu.org/meetings/2013/FM/sections/A/sessions/A43C/abstracts/A43C-0267.html>)
- Black, R.X., R.M. Westby and Y.-Y. Lee 2013: Boreal Cool Season Anomalous Temperature Regimes: Recent Trends and Low Frequency Mode Modulation. Workshop on Analyses, Dynamics and Modeling of Large-Scale Meteorological Patterns Associated with Extreme Temperature and Precipitation Events, US CLIVAR. (Abstract at: [http://usclivar.org/sites/default/files/meetings/black\\_robert\\_extremes2013.pdf](http://usclivar.org/sites/default/files/meetings/black_robert_extremes2013.pdf))
- Lee, Y.-Y., and R.X. Black 2013: Boreal low frequency variability in CMIP5 models. 19<sup>th</sup> Conference on Atmospheric and Oceanic Fluid Dynamics, American Meteorological Society. (Abstract at: <https://ams.confex.com/ams/19Fluid17Middle/webprogram/Paper227215.html>)
- Black, R.X., Y.-Y. Lee and B.A. McDaniel 2013: Stratospheric annular modes and stratosphere-troposphere coupling in CMIP5 models. 17<sup>th</sup> Conference on Middle Atmosphere/19<sup>th</sup> Conference on Atmospheric and Oceanic Fluid Dynamics, American Meteorological Society. (Abstract at: <https://ams.confex.com/ams/19Fluid17Middle/webprogram/Paper227206.html>)
- Black, R.X., and Y.-Y Lee 2013: Boreal low frequency variability, annular modes and

- stratosphere-troposphere coupling in CMIP5 models. Third SPARC DynVar workshop/ First SPARC SNAP workshop, World Climate Research Program. (Abstract at: [http://www.met.reading.ac.uk/~pn904784/DynVar\\_SNAP\\_Workshop/abstract/black.pdf](http://www.met.reading.ac.uk/~pn904784/DynVar_SNAP_Workshop/abstract/black.pdf))
- Westby, R.M., Y.-Y. Lee, and R.X. Black 2013: Extreme Temperature Regimes in the United States: Long-term Trends and Low Frequency Mode Modulation in Observations and CMIP5 Models. 25<sup>th</sup> Conference on Climate Variability and Change, American Meteorological Society.  
(Abstract at: <https://ams.confex.com/ams/93Annual/webprogram/Paper220229.html>)
- Lee, Y-Y., and R.X. Black, 2012: Boreal Low Frequency Variability in CMIP5 models. 45<sup>th</sup> Annual Fall Meeting, American Geophysical Union.  
(Abstract at: <http://fallmeeting.agu.org/2012/eposters/eposter/a531-0320/>)
- Black, R.X., R.M. Westby, and Y-Y. Lee, 2012: Extreme Temperature Regimes during the Cool Season: Low Frequency Modulation and Representation in CMIP5 Models. Asia Oceania Geosciences Society – AGU (WPGM) Joint Assembly.  
(Abstract at: <http://www.asiaoceania.org/aogs2012/mars2/pubViewAbs.asp?sMode=oral&sectionIdO=4&dayRank=2&submit=Browse+Abstracts>)
- Black, R.X., Y-Y. Lee, and B.A. McDaniel, 2012: Structural Evolution, Dynamics and Tropospheric Impact of the Polar Annular Mode. Asia Oceania Geosciences Society – AGU (WPGM) Joint Assembly.  
(Abstract at: <http://www.asiaoceania.org/aogs2012/mars2/pubViewAbs.asp?sMode=oral&sectionIdO=4&dayRank=1&submit=Browse+Abstracts>)
- Black, R.X., R.M. Westby, and Y.-Y. Lee, 2012: Extreme Temperature Regimes During the Cool Season Part II: Simulated Behavior in CMIP5 Simulations. 24<sup>th</sup> Conference on Climate Variability and Change, American Meteorological Society.  
(Abstract at: <http://ams.confex.com/ams/92Annual/webprogram/Paper194941.html>)
- Westby, R.M. and R.X. Black, 2012: Extreme Temperature Regimes During the Cool Season Part I: Recent Observed Behavior and Low Frequency Modulation. 24<sup>th</sup> Conference on Climate Variability and Change, American Meteorological Society.  
(Abstract at: <http://ams.confex.com/ams/92Annual/webprogram/Paper194940.html>)
- Black, R.X., R.M. Westby and Y.-Y. Lee, 2011: Extreme Temperature Regimes during the Cool Season: Recent Observed Behavior and Low Frequency Modulation. Department of Energy Climate and Earth System Modeling Meeting.
- Black, R.X., B.A. McDaniel and Y.-Y. Lee, 2011: Stratosphere-troposphere coupling: The stratospheric seasonal cycle in CMIP5 models. WCRP Open Science Meeting.  
([http://conference2011.wcrp-climate.org/abstracts/C34/Black\\_C34\\_W176A.pdf](http://conference2011.wcrp-climate.org/abstracts/C34/Black_C34_W176A.pdf))
- Black, R.X., and R. Westby, 2011: Extreme temperature regimes during the cool season, 23<sup>rd</sup> Conference on Climate Variability and Change, American Meteorological Society.  
(Abstract at: <http://ams.confex.com/ams/91Annual/webprogram/Paper180666.html>)
- Black, R.X., and K. Hornberger, 2010: Anomalous temperature regimes during the cool season, 22<sup>nd</sup> Conference on Climate Variability and change, American Meteorological Society.  
(Abstract at: [http://ams.confex.com/ams/90annual/techprogram/paper\\_161517.htm](http://ams.confex.com/ams/90annual/techprogram/paper_161517.htm))
- Black, R.X., and B.A. McDaniel, 2007: Sub-Monthly Polar Vortex Variability and Stratosphere-Troposphere Coupling in the Arctic, 14<sup>th</sup> Conference on Middle Atmosphere, American Meteorological Society.



- (Abstract at: [http://ams.confex.com/ams/15isa14m/techprogram/paper\\_125393.htm](http://ams.confex.com/ams/15isa14m/techprogram/paper_125393.htm))
- Black, R.X., and B.A. McDaniel, 2007: Sub-Monthly Polar Vortex Variability and Stratosphere-Troposphere Coupling in the Arctic, Chapman Conference on The Role of the Stratosphere in Climate and Climate Change, American Geophysical Union.  
(Abstract at: <http://www.atm.amtp.cam.ac.uk/shuckburgh/AGU/main.html#programme>)
- Black, R.X., B.A. McDaniel, and W.A. Robinson, 2006: Stratosphere-troposphere coupling during polar vortex breakdown, *The James Holton Symposium*, American Meteorological Society.  
(Abstract: [http://ams.confex.com/ams/Annual2006/techprogram/paper\\_100323.htm](http://ams.confex.com/ams/Annual2006/techprogram/paper_100323.htm))
- Black, R.X., B.A. McDaniel, and W.A. Robinson, 2005: Spring onset in the Northern Hemisphere: A role for the stratosphere?, *17th Conference on Climate Variability and Change*, American Meteorological Society.  
(Abstract: [http://ams.confex.com/ams/Cambridge/techprogram/paper\\_92721.htm](http://ams.confex.com/ams/Cambridge/techprogram/paper_92721.htm))
- Robinson, D.P., and R.X. Black, 2005: Storm tracks and synoptic eddy dynamics in NASA model simulations, *15th Conference on Atmospheric and Oceanic Fluid Dynamics*, American Meteorological Society.  
(Abstract: [http://ams.confex.com/ams/Cambridge/techprogram/paper\\_92726.htm](http://ams.confex.com/ams/Cambridge/techprogram/paper_92726.htm))
- McDaniel, B.A., and R.X. Black, 2005: Intraseasonal dynamical evolution of the Northern Annular Mode, *13th Conference on Middle Atmosphere*. American Meteorological Soc.  
(Abstract: [http://ams.confex.com/ams/Cambridge/techprogram/paper\\_92702.htm](http://ams.confex.com/ams/Cambridge/techprogram/paper_92702.htm))
- Black, R.X., and B.W. Whitesides, 2005: Interannual Variability in the Troposphere-Stratosphere Climate System and the Solar Cycle, *16th Conference on Climate Variability and Change*, American Meteorological Society.  
(Abstract: [http://ams.confex.com/ams/Annual2005/techprogram/paper\\_85889.htm](http://ams.confex.com/ams/Annual2005/techprogram/paper_85889.htm))
- Black, R.X., B.A. McDaniel, and W.A. Robinson, 2005: Stratosphere-Troposphere Coupling During Spring Onset, *16th Conference on Climate Variability and Change*, American Meteorological Society.  
(Abstract: [http://ams.confex.com/ams/Annual2005/techprogram/paper\\_85860.htm](http://ams.confex.com/ams/Annual2005/techprogram/paper_85860.htm))
- Black, R.X., and B.W. Whitesides, 2004: Stratosphere-Troposphere Coupling and the Solar Cycle, *35<sup>th</sup> COSPAR Scientific Assembly*, Committee on Space Research.  
(Abstract: <http://www.cosis.net/abstracts/COSPAR04/02048/COSPAR04-A-02048.pdf>)
- Black, R.X., B.A. McDaniel, and W.A. Robinson, 2004: Spring Onset in the Northern Hemisphere: a role for the stratosphere?, *29<sup>th</sup> Climate Diagnostics and Prediction Workshop*, US Dept. of Commerce/NOAA. (Powerpoint presentation at: [http://www.cpc.ncep.noaa.gov/products/outreach/proceedings/cdw29\\_proceedings/black.ppt](http://www.cpc.ncep.noaa.gov/products/outreach/proceedings/cdw29_proceedings/black.ppt))
- Black, R.X., and B.A. McDaniel, 2004: Mechanisms for Intraseasonal Variability in the Northern Annular Mode, *Fifteenth Symposium on Global Change and Climate Variations*. American Meteorological Society.  
(Abstract: [http://ams.confex.com/ams/84Annual/techprogram/paper\\_70921.htm](http://ams.confex.com/ams/84Annual/techprogram/paper_70921.htm))
- Black, R.X., and B.A. McDaniel, 2003: Stratosphere-Troposphere Interactions: Case Studies of the NAM, *Fourteenth Conference on Atmospheric and Ocean Fluid Dynamics*. American Meteorological Society.  
(Abstract: <http://ams.confex.com/ams/14Fluid/14Fluid/abstracts/62061.htm>)
- McDaniel, B.A., and R.X. Black, 2003: Stratosphere-Troposphere Interactions: Intraseasonal Variations in the NAM, *Fourteenth Conference on Atmospheric and Ocean Fluid*

*Dynamics*. American Meteorological Society.  
(Abstract: <http://ams.confex.com/ams/14Fluid/14Fluid/abstracts/62062.htm>)  
Robinson, D.P., and R.X. Black, 2003: Dynamical Assessment of Midlatitude Subseasonal Variability in NASA/GSFC GCMs, *Fourteenth Conference on Atmospheric and Oceanic Fluid Dynamics*. American Meteorological Society.  
(Abstract: <http://ams.confex.com/ams/14Fluid/14Fluid/abstracts/62063.htm>)

#### **D. SYMPOSIA AND INVITED SEMINARS**

US CLIVAR - Workshop on Analyses, Dynamics and Modeling of Large-Scale Meteorological Patterns Associated with Extreme Temperature and Precipitation Events, August 2013 (**Invited Speaker**).

AMS - 17th Conference on Middle Atmosphere/19th Conference on Atmospheric and Oceanic Fluid Dynamics, June 2013.

WCRP - Third SPARC DynVar workshop/First SPARC SNAP workshop, April 2013.

MIT - Cool Season Temperature Regimes: Low Frequency Modulation and Representation in CMIP5 Models, November 2012 (**Invited Seminar**).

National Taiwan University - Extreme Temperature Regimes during the Cool Season: Low Frequency Modulation and Representation in CMIP5 Models, August 2012 (**Invited Seminar**).

AOGS - AGU (WPGM) Joint Assembly, August 2012 (**Invited Speaker**).

NCAR - Advance Study Program Summer Colloquium. The Weather-Climate Intersection: Advances and Challenges, June 2012 (**Invited Speaker**).

AMS - 24<sup>th</sup> Conference on Climate Variability and Change, January 2012.

University of Georgia – Extreme Temperature Regimes during the Cool Season: Recent Observed Behavior and Low Frequency Modulation, November 2011 (**Invited Seminar**).

WCRP - Open Science Meeting, October, 2011.

North Carolina State University – Extreme Temperature Regimes during the Cool Season, April 2011 (**Invited Seminar**).

AMS – 23<sup>rd</sup> Conference on Climate Variability and Change, January 2011.

AMS - 22<sup>th</sup> Conference on Climate Variability and Change, January 2010.

AGU - Chapman Conference on The Role of the Stratosphere in Climate and Climate Change, September 2007.

AMS - 14<sup>th</sup> Conference on Middle Atmosphere, August 2007.

SUNY/Stony Brook - Stratospheric Polar Vortex Breakdown, Stratosphere-Troposphere Coupling and Spring Onset, April 2007 (**Invited Seminar**).

University of Wisconsin - The David Houghton Symposium, March 2006 (**Invited Speaker**).

AMS - The James Holton Symposium, January 2006.

AGU - Chapman Conference on Jets and Annular Structures in Geophysical Fluids, January 2006 (**Invited Speaker**).

AMS - 15<sup>th</sup> Conference on Atmospheric and Oceanic Fluid Dynamics/13<sup>th</sup> Conference on Middle Atmosphere/17<sup>th</sup> Conference on Climate Variability and Change, June 2005.

AMS - 16<sup>th</sup> Conference on Climate Variability and Change, January 2005.

NOAA/CPC - 29<sup>th</sup> Climate Diagnostics and Prediction Workshop, October 2004.

USWRP - Workshop on the Implementation of THORPEX, August 2004.

Committee on Space Research - 35<sup>th</sup> COSPAR Scientific Assembly, July 2004.

University of Wisconsin-Madison - Weather Regime Dynamics, March 2004 (**Invited Speaker**).

AMS - 15<sup>th</sup> Symposium on Global Change and Climate Variations, January 2004.

AMS - 14<sup>th</sup> Conference on Atmospheric and Oceanic Fluid Dynamics, June 2003.

Whistler, British Columbia - Workshop: The Role of the Stratosphere in Tropospheric Climate, April 2003 (**Invited Speaker**).

North Carolina State University - The Role of the Stratosphere in Recent Climate Variability, April 2002 (**Invited Seminar**).

NASA - Workshop on Prospects for Improved Forecasts of Weather and Short-Term Climate Variability on Subseasonal (2 week to 2 month) Time Scales, April 2002.

AMS - 13<sup>th</sup> Symposium on Global Change and Climate Variations, January 2002.

AMS - 13<sup>th</sup> Conference on Atmospheric and Oceanic Fluid Dynamics, June 2001.

NOAA/CPC - 25<sup>th</sup> Climate Diagnostics and Predictions Workshop, October 2000.

AMS - 11<sup>th</sup> Conference on the Middle Atmosphere, January, 2000.

AGU - The Arctic Oscillation, December, 1999.

NOAA/CPC - 24<sup>th</sup> Climate Diagnostics and Predictions Workshop, November 1999.

AMS - 12<sup>th</sup> Conference on Atmospheric and Oceanic Fluid Dynamics, June, 1999.

University of Washington - Stratospheric Forcing of Tropospheric Climate: Potential Vorticity Inversions of the Arctic Oscillation, June 1999 (**Invited Seminar**).

NOAA/CPC - 23<sup>rd</sup> Climate Diagnostics and Predictions Workshop, October 1998.

Georgia Tech - A New Perspective on the Dynamical Interaction Between the Stratosphere and Troposphere, January, 1998 (**Invited Seminar**).

NOAA/NASA/NSF - First World Climate Research Programme International Conference on Reanalyses, October, 1997.

IUGG - Assembly of the International Association of Meteorology and Atmospheric Sciences, July, 1997.

NOAA Climate Diagnostics Center - Potential Vorticity-Based Diagnoses of the Northern Hemisphere Wintertime Circulation using Modern Reanalysis Datasets, May, 1997 (**Invited Seminar**).

NASA/Goddard Space Flight Center - Potential Vorticity-Based Diagnoses of the Northern Hemisphere Wintertime Circulation using the GEOS-1 Assimilated Dataset, April, 1997 (**Invited Seminar**).

NOAA/CPC - 21st Climate Diagnostics and Prediction Workshop, October, 1996. NCAR - Evaluating the Statistics and Structure of Anomalous Weather Regimes in the CCM, April, 1996 (**Invited Seminar**).

AMS - Conference on the Global Ocean-Atmosphere-Land System, February, 1996.

Georgia Tech - Persistent Abnormal Weather Patterns during Northern Hemisphere Winter, February, 1996 (**Invited Seminar**).

AGU - Tropical/Midlatitude Interaction and Transport, December, 1995.

AMS - Tenth Conference on Atmospheric and Oceanic Waves and Stability, June, 1995.

NOAA/CAC - 20th Climate Diagnostics Workshop, October, 1995.

University of South Alabama - Weather Regimes in the Northern Hemisphere Wintertime Circulation, April, 1995 (**Invited Seminar**).

NASA - Workshop on Results from the GEOS-1 Five-Year Assimilation, March, 1995.

NOAA/ONR/NSF - International Symposium on the Life Cycles of Extratropical Cyclones, June, 1994.

AMS - Sixth Conference on Climate Variations, January, 1994.

NOAA/CAC - 18th Climate Diagnostics Workshop, November, 1993.  
NOAA/NSF - Workshop on Numerical Extended Range Weather Prediction, June, 1993.  
AMS - Ninth Conference on Atmospheric and Oceanic Waves and Stability, May, 1993.  
NOAA/NASA - Errors in Atmospheric Model Climate, March, 1993.  
NOAA/CAC - 17th Climate Diagnostics Workshop, October, 1992.  
McGill University - The Dynamics of Large-Scale Cyclogenesis over the North Pacific Ocean,  
February, 1992 (Invited Seminar).  
AMS - Ninth Conference on Numerical Weather Prediction, October, 1991.  
IUGG/IAMAP - Large-Scale Atmospheric Flow and Variability, August, 1991.  
AMS - First International Symposium on Winter Storms, May, 1991.  
NCAR - Workshop on Numerical Long-Range Prediction, June, 1990.

## **E1. RESEARCH GRANTS AND CONTRACTS (AS PI)**

Collaborative Research: Large-Scale Organization and Scale-Interaction: A Dynamical Pathway toward Understanding, Modeling and Predicting Energy and Water Cycle Extremes (PI; Yi Deng is Co-PI):

DOE 08/14-08/18 (~75%)

Collaborative Research: The Arctic Springtime Transition: Dynamics, Impacts, and Future Changes (PI):

NSF 09/11-08/15 (100%)

Low Frequency Modulation of Extreme Temperature Regimes in a Changing Climate (PI; Yi Deng is Co-PI):

DOE 09/10-08/14 (~85%)

An Observational and Modeling Study of Spring Onset in the Northern Hemisphere Circulation (PI):

NSF 04/05-03/09 (100%)

Stratospheric Modulation of Terrestrial Climate during the Solar Cycle (PI):

NASA 06/03-05/07 (100%)

Diagnostic Studies of Short-Term Climate Variability in NASA/GSFC General Circulation Models (PI):

NASA 04/01-03/05 (100%)

A Diagnostic and Modeling Study of Stratosphere-Troposphere Coupling in the Arctic Oscillation (PI):

NSF 06/00-05/04 (100%)

Potential Vorticity Diagnoses of the Life Cycles of Extratropical Intraseasonal Transient Eddies (PI):

NASA 04/98-03/01 (100%)

Mechanistic Analyses of Weather Regime Transitions in the Community Climate Model (PI):

NSF 11/96-10/00 (100%)

Potential Vorticity Diagnoses of Seasonal and Intraseasonal Variability in an Assimilated Dataset (PI):

NASA 04/95-03/98 (100%)

The Dynamics of Weather Regime Transitions (PI):

NSF 09/94-08/96 (100%)

Observational and Modeling Studies of Low Frequency Variability (PI):

NOAA 02/94-09/94 (100%)

## **E2. RESEARCH GRANTS AND CONTRACTS (AS CO-I)**

Investigating the Dynamical Control of the Pacific Storm Track on Occurrence of Extreme Hydrological Events in the Western United States Using NASA Observations and Models (Co-I; PI is Yi Deng):

NASA 10/08-09/11 (~10%)

Characteristics and Predictability of the Extratropical Atmospheric Response to ENSO (Co-I; PI is Hui Wang):

NOAA 12/01-11/04 (~10%)

## **F1. PH.D. STUDENTS**

Jia He - PhD (2017)  
Rebecca Westby - PhD (2015)  
Dennis Robinson - PhD (2006)  
Brent McDaniel - PhD (2005)  
Katherine Evans - PhD (2000)

## **F2. M.S. STUDENTS**

Robert Haynes - MS (2017)  
Mary Mays - MS (2012)  
Rebecca Westby - MS (2011)  
Kelli Hornberger - MS (2010)  
Brandon Miller - MS (2008)  
Benton Whitesides - MS (2006)  
John Kelly - MS (1997)

## **F3. UNDERGRADUATE STUDENTS SUPERVISED**

David D'Onofrio (EAS, BS 2004)  
Kelly Huard (EAS, BS 2004)  
Jonathan Edwards-Opperman (EAS, BS 2014)

## **F4. SERVICE ON THESIS COMMITTEES**

Yufei Zou (PhD)  
Yi Lu (PhD)  
Xiaoyu Long (PhD; NC State)  
Emily Christ (PhD)  
Mark Simpson (PhD [ME])  
Brad Hegyi (PhD)  
Tianyu Jiang (PhD)  
Fernando Hirata (PhD)  
Yisen Zhong (PhD)  
Marilee Roell (PhD)  
James Belanger (PhD)  
Chia-Jeng Chen (Phd [CEE])  
Alisa Holley (PhD)  
Jason Furtado (PhD)  
Matthew Widlansky (Phd)  
Wei Liao (PhD)  
Angela Fritz (MS)  
Katia Fernandes (PhD)  
Manuel Zuluaga (PhD)  
Paola Arias (PhD)  
Violeta Toma (PhD)  
Jun Jian (PhD)

Qing Yang (PhD)  
Yunsoo Choi (PhD)  
Wei Liao (PhD)  
Oleksandr Karabanov (PhD)  
Carlos Hoyos (PhD)  
Jun Jian (MS)  
Dana Long (MS)  
Violeta Toma (MS)  
Tao Zeng (PhD)

**F5. POSTDOCTORAL FELLOWS SUPERVISED**

Dennis Robinson - (2006/7)  
Brent McDaniel - (2005/7)  
Yun-Young Lee – (2011-13)  
Zuowei Xie – (2015-2017)

## V. SERVICE

### A. PROFESSIONAL CONTRIBUTIONS

Adjunct Associate Professor - Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University (2014-present)

External Reviewer - Faculty Search, Department of Atmospheric Sciences, National Taiwan University (2011, 2013, 2014)

Member - US CLIVAR Working Group: Large Scale Circulation Patterns Associated with Extremes (2012-present)

Member – Scientific Organizing Committee for the US CLIVAR Workshop on Analyses, Dynamics and Modeling of Large-Scale Meteorological Patterns Associated with Extreme Temperature and Precipitation Events (2013)

Contributor - Modeling the Dynamics and Variability of the Stratosphere-Troposphere System (DynVar); part of the WCRP's core project Stratospheric Process and their Role in Climate Project (2012-2013)

Editorial Board - *Journal of Climate* (2008-2010)

Member - University Corporation for Atmospheric Research Membership Committee (2006-2009)

Member - NASA/GSFC Modern Era Reanalysis for Research and Applications (MERRA) External Users Group Committee (2005-2007)

Associate Editor - *Journal of Climate* (2000-2007)

Ex-Officio - AMS Committee on Atmospheric and Oceanic Fluid Dynamics (2004-2005)

Chair - AMS Committee on Atmospheric and Oceanic Fluid Dynamics (2001-2004)

Chair - American Meteorological Society (AMS) Nomination Panel for the Bernhard Haurwitz Memorial Lecturer (2003)

Member - AMS Committee on Atmospheric and Oceanic Fluid Dynamics (1999-2001).

Member - Program Committee for the 14<sup>th</sup> AMS Conference on Atmospheric and Oceanic Fluid Dynamics (2003).

Chair - Program Committee for the 13<sup>th</sup> AMS Conference on Atmospheric and Oceanic Fluid Dynamics (2001).

US EPA Fellowship Peer Review Committee: Geography/Atmospheric Science (1998-99)

Reviewer for *Monthly Weather Review*, *Journal of the Atmospheric Sciences*, *Journal of Climate*, *Bulletin of the American Meteorological Society*, *Geophysical Research Letters*, *Atmospheric Science Letters*, *Climate Dynamics*, *Journal of Geophysical Research*, *International Journal of Climatology*, *Journal of Geoscience Education*, *Journal of Atmospheric and Solar-Terrestrial Physics*.

Reviewer of proposals for *NSF*, *NASA*, *NOAA*, *NERC (UK)* and *NSERC (Canada)*

### B. INSTITUTE CONTRIBUTIONS

EAS Strategic Planning Committee (2015/16)

Institute Advisory Committee on Responsible Conduct in Research (2011-2014)

Institute Academic Senate (2011-14)

Sigma Xi Faculty Best Paper Award Committee (2012)

EAS Web and Social Computing Committee (2011/12)

EAS Graduate Coordinator (2007-present)

College of Science EAS Chair Review Committee (2007/08)



Chair, Faculty Search Committee (2006/07)  
Chair, Graduate Studies Committee (2004/05; 2005/06)  
Chair, Graduate Admissions Committee (1999-2004, 2008/09, 2009-12 [co-chair])  
Institute Advisory Committee on Promotion of Research Faculty (2002, 2003)  
School Advisory Committee (1996/97; 1998/99; 2000-2002)  
Graduate Studies Committee (2000-2002; 2015/2016)  
Faculty Search Committee (1998/99; 2000/01; 2008/09; 2010/11)  
Graduate Admissions Committee (1997-1999; 2012-2016)  
Awards Committee (1996-1998)  
Comprehensive Exam Revision Committee (ad hoc - 1997/98)  
Facilities Committee (1995/96)  
Undergraduate Studies Committee (1994/95)