

DAVID S. NOLAN
Professor and Chair
Department of Atmospheric Sciences
Rosenstiel School of Marine and Atmospheric Science
University of Miami

Contact:

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Education:

Harvard University, Graduate School of Arts and Sciences, Cambridge, Massachusetts.

Ph.D. in Earth and Planetary Sciences, completed October, 1996.

Advisor: Brian Farrell.

Thesis: *Axisymmetric and Asymmetric Vortex Dynamics in Convergent Flows.*

Harvard College, Cambridge, Massachusetts.

B.A., Physics, *cum laude* 1990.

Research and Teaching Experience:

- 06/14 - Present: *Professor and Chair, Department of Atmospheric Sciences, Rosenstiel School of Marine and Atmospheric Science.* Ongoing research on the inner-core dynamics of hurricanes and tornadoes; development of the Weather Research and Forecast (WRF) model for tropical cyclone research and forecasting; dynamics of convection in the inter-tropical convergence zone; undergraduate and graduate instruction in meteorology. Supervision and planning for a new university department of 11 faculty and over 50 undergraduate and graduate students.
- 06/13 - 05/14: *Professor, Division of Meteorology and Physical Oceanography, Rosenstiel School of Marine and Atmospheric Science.*
- 06/08 - 05/13: *Associate Professor, Division of Meteorology and Physical Oceanography, Rosenstiel School of Marine and Atmospheric Science.*
- 06/05 - 05/08: *Assistant Professor, Division of Meteorology and Physical Oceanography, Rosenstiel School of Marine and Atmospheric Science.*
- 7/02 - 5/05: *Research Assistant Professor, Division of Meteorology and Physical Oceanography, Rosenstiel School of Marine and Atmospheric Science.*
- 7/01 - 6/02: *Visiting Research Scientist, Princeton University Program in Atmospheric and Oceanic Sciences and Geophysical Fluid Dynamics Laboratory.*

- 11/98 - 6/01: *Postdoctoral Associate, Department of Atmospheric Science, Colorado State University.*
- 11/96 - 11/98: *Postdoctoral Fellow, Mathematics Department, Computing Sciences Directorate, Lawrence Berkeley National Laboratory.*
- 1990-1996: *Research Assistant, Department of Earth and Planetary Sciences, Harvard University.*
- 1992, Summer: *Research Assistant, Department of Mathematics, Lawrence Berkeley National Laboratory.*
- 1989, Summer: *Research Assistant, Department of Physics, Smith College, Northampton, MA.*

Awards:

American Meteorological Society, *Banner Miller Award*, 2016.

Service:

- 2018: *Topic Chair, International Workshop on Tropical Cyclones. Organized topic report for "Tropical Cyclone Structure Analysis and Change."*
- 2017-2018: *Drafting Committee for the American Meteorological Society Statement on Climate Change. Committee to evaluate and revise the AMS position on climate change and its effects.*
- 2016-2019: *Associate Editor, Journal of Advances in Modeling Earth Systems.*
- 2012-2016: *Scientific Review Committee for the Hurricane Forecasting Improvement Program. External committee to advise NOAA on the progress and future directions for HFIP.*
- 2009-2015: *International Committee for Dynamic Meteorology. A commission of the International Association of Meteorology and Atmospheric Sciences (IAMAS), with the goal of furthering the pursuit of and international cooperation in the science of dynamic meteorology, and the task of organizing biennial meetings at the IUGG and IAMAS conferences.*
- 2008-2013: *UCAR President's Advisory Committee on University Relations. University of Miami representative to the committee that advises the president of the University Corporation for Atmospheric Research.*

2007-2009: *Postdoctoral Programs Steering Committee*. Rosenstiel School representative to University-wide committee overseeing post-doctoral programs and regulations.

2004-2006: *Academic Chair, Division of Meteorology and Physical Oceanography, Rosenstiel School*. Oversight and administration of the graduate admissions process for the Division, comprehensive exams, and academic requirements for graduate students; also served on the School-wide Academic Committee.

Article reviews for: *Atmospheric Science Letters*.
Atmospheric Chemistry and Physics.
Australian Meteorological and Oceanographic Journal.
Boundary Layer Meteorology.
Climate Dynamics.
Dynamics of Atmospheres and Oceans.
E-Journal of Severe Storms Meteorology.
Geophysical Research Letters.
Journal of Advances in Modeling Earth Systems.
Journal of Climate.
Journal of the Atmospheric Sciences.
Journal of Wind Engineering and Industrial Aerodynamics.
Meteorology and Atmospheric Physics.
Monthly Weather Review.
Physics of Fluids.
Quarterly Journal of the Royal Meteorological Society.
Science.
Tellus.
Terrestrial, Atmospheric, and Oceanic Sciences.
Weather and Forecasting.

Panels: *Proposal review panel for NASA Hurricane Science Research Program*, August 2008, Washington DC.

Proposal review panel for University of Miami Provost Awards for Natural Sciences and Engineering. March 2010, Miami, FL.

Proposal review panel for NASA ROSES 16 Modeling, Analysis, and Prediction Program. November 2016, Arlington, VA.

Thesis and Dissertation Advising:

Jeremy Pennington, M.S. 2003, *committee member*,
“Environmental Moisture Effects on Atlantic Tropical Cyclogenesis.”

Peter Kozich, M.S. 2005, *committee member*,
“Inner Core Structure and Intensity Change in Hurricane Isabel (2003).”

Melicie DesFlots, Ph.D. 2008, *committee member*,
“Environmental and Internal Controls of Tropical Cyclone Intensity Change.”

Pallav Ray, Ph.D. 2008, *committee member*,
“The Initiation of the Madden-Julian Oscillation.”

Yumin Moon, M.S. 2008, *advisor and committee chair*,
“Dynamical Impacts of Rotating Convective Asymmetries on Tropical Cyclones.”

Munehiko Yamaguchi, M.S., 2010, *committee member*,
“Initial Condition Sensitivity and Dynamical Mechanisms of Perturbation Growth in Tropical Cyclones.”

Daniel Stern, Ph.D. 2010, *advisor and committee chair*,
“The Vertical Structure of Tangential Winds in Tropical Cyclones: Observations, Theory, and Numerical Simulations.”

Angela Colbert, M.S. 2010, *committee member*,
“Sensitivity of North Atlantic Tropical Cyclone Tracks to Climate Variability and Climate Change.”

Will Komaromi, M.S. 2010, *committee member*,
“Synoptic Sensitivity Analysis of Typhoon Sinlaku (2008) and Hurricane Ike (2008).”

Damianos Mantsis, Ph.D. 2011, *committee member*,
“Atmospheric Response to Orbital Forcing and 20th Century Sea Surface Temperatures.”

Christine Standohar, M.S. 2012, *committee member*,
“Impact of Upper Ocean Warming on Hurricane Intensity.”

Yumin Moon, Ph.D. 2012, *advisor and committee chair*,
“Dynamics and Evolution of Spiral Rainbands as Seen in Numerical Simulations of Tropical Cyclones.”

Michael McGauley, Ph.D. 2012, *advisor and committee chair*,
“Understanding Environmental Favorability for Tropical Cyclogenesis from Analysis of Threshold Parameters.”

Will Komaromi, Ph.D. 2014, *committee member*,
“Tropical Cyclogenesis: Observations and Predictability.”

Ting-Chi Wu, Ph.D. 2014, *committee member*,
“Understanding the Influence of Assimilating Satellite-Derived Observations on Mesoscale Analyses and Forecasts of Tropical Cyclone Track and Structure.”

David Yeomans, M.S. 2014, *committee member*,
“Using Dropsonde and Satellite Measurements to Evaluate Mid-Tropospheric Humidity and its Importance in Tropical Cyclogenesis.”

Joaquin Blanco, M.S. 2015, *advisor and committee chair*,
“Convectively Coupled Kelvin Waves: Structure and Variability Analysis with Different Model Configurations.”

Kieran Bhatia, Ph.D. 2015, *advisor and committee chair*,
“Tropical Cyclone Intensity Error Forecasts and Their Applications.”

Matthew Onderlinde, Ph.D. 2016, *advisor and committee chair*,
“The Tropical Cyclone Response to Structural and Temporal Variability in the Environmental Wind Profile.”

Peter J. Finocchio, Ph.D. 2017, *committee member*,
“The Structure of Vertical Wind Shear in Tropical Cyclone Environments: Implications for Forecasting and Predictability.”

Michael Rudko, Ph.D. 2017, *committee member*,
“Anomalous Structures of Ocean Transport: Dynamics, Energetics, Transport.”

Joaquin E. Blanco, Ph.D. 2018, *adviser and committee chair*,
“Modulation of Cloud Cluster Propagation by Super Cloud Clusters.”

Brian Matilla, M.S. 2018, *committee member*,
“A Quasi-Global Survey of Precipitation Extremes: Interpretations of their Dynamics and Thermodynamics.”

I-Kuan Hu, Ph.D. candidate, *committee member*.

Yi Dai, Ph.D. candidate, *committee member*.

Shun-nan Wu, Ph.D. candidate, *committee member*.

Lisa R. Bucci, Ph.D. candidate, *committee member*.

Luna Hiron, Ph.D. candidate, *committee member*.

Rebecca C. Evans, Ph.D. candidate, *advisor and committee chair*.

James A. Hlywiak, Ph.D. candidate, *advisor and committee chair*.

Joshua B. Wadler, Ph.D. candidate, *committee member*.

Postdoctoral Mentoring:

Dr. Daniel Hodyss, 2003 – 2005.

Dr. Eric Rappin, 2005 – 2008.

Dr. Nathan Dahl, 2014 – 2017.

Memberships:

1997-Present: *American Meteorological Society*.

2000-Present: *American Geophysical Union*.

Field Experience:

2005: Rainbands and Intensity Change Experiment (RAINEX). Co-PI; forecasting and decision-making for flights; one flight on the NOAA P3 into Hurricane Ophelia.

2014: Sensing Hazards with Operational Unmanned Technology (SHOUT): Mission scientist for two NASA Global Hawk missions over Tropical Storm Karl.

2018: Deployments with the University of Florida wind engineering team to place

Florida Coastal Monitoring Program towers into the paths of Hurricane Florence and Hurricane Michael.

Refereed Publications:

* = supervised student; # = supervised post-doc.

Dunion, J. P., C. D. Thorncroft, and D. S. Nolan, 2019: Tropical cyclone diurnal signals in a hurricane nature run. *Mon. Wea. Rev.*, **147**, 363-388.

Klotz, B. W., and D. S. Nolan, 2019: SFMR surface wind undersampling over the tropical cyclone lifecycle. *Mon. Wea. Rev.*, **147**, 247-268.

Miyamoto, Y., D. S. Nolan, and N. Sugimoto, 2018: A dynamical mechanism for secondary eyewall formation in tropical cyclones. *J. Atmos. Sci.*, **75**, 3965-3986.

#Dahl, N. A., and D. S. Nolan, 2018: Using high-resolution simulations to quantify errors in radar estimates of tornado intensity. *Mon. Wea. Rev.*, **146**, 2271-2295.

Miyamoto, Y., and D. S. Nolan, 2018: Structural changes preceding rapid intensification in tropical cyclones as shown in a large ensemble of idealized simulations. *J. Atmos. Sci.*, **75**, 555-569.

Stern, D. P., J. L. Vigh, D. S. Nolan, and F. Zhang, 2017: Reply to “Comments on ‘Revisiting the relationship between eyewall contraction and intensification.’” *J. Atmos. Sci.*, **74**, 4275-4286.

Cohen, Y., N. Harnik, E. Heifetz, D. S. Nolan, D.-D. Tao, and F. Zhang, 2018: On the violation of gradient wind balance at the top of tropical cyclones. *Geophys. Res. Lett.*, **44**, 8017-8026.

Nolan, D. S., and J. A. Zhang, 2017: Spiral gravity waves radiating from tropical cyclones. *Geophys. Res. Lett.*, **44**, 3924-3931, doi:10.1002/2017/GL073572.

*Bhatia, K. T., D. S. Nolan, A. B. Schumacher, and M. DeMaria, 2017: Improving tropical cyclone intensity forecasts with PRIME. *Wea. Forecasting*, **32**, 1353-1377.

*Onderlinde, M. J., and D. S. Nolan, 2017: The tropical cyclone response to changing wind shear using the method of time-varying point-downscaling. *J. Adv. Model. Earth Syst.*, **9**, doi:10.1002/2016MS000796.

- Dai, Y., S. J. Majumdar, and D. S. Nolan, 2017: Secondary eyewall formation in tropical cyclones by outflow-jet interaction. *J. Atmos. Sci.*, **74**, 1941-1958.
- #Dahl, N. A., D. S. Nolan, G. H. Bryan, and R. Rotunno, 2017: Using high-resolution simulations to quantify underestimates of tornado intensity from in situ observations. *Mon. Wea. Rev.*, **145**, 1963-1982.
- Nolan, D. S., N. A. Dahl, G. H. Bryan, and R. Rotunno, 2017: Tornado vortex structure, intensity, and surface wind gusts in large-eddy simulations with fully developed turbulence. *J. Atmos. Sci.*, **74**, 1573-1597.
- Bryan, G. H., N. A. Dahl, D. S. Nolan, and R. Rotunno, 2017: An eddy-injection method for large-eddy simulations of tornado-like vortices. *Mon. Wea. Rev.*, **145**, 1937-1961.
- Rudko, M. V., I. V. Kamenkovich, and D. S. Nolan, 2016: Stability of baroclinic vortices on the β -plane and implications for transport. *J. Phys. Oceanography*, **46**, 3245-3262.
- Rotunno, R., G. H. Bryan, D. S. Nolan, and N. A. Dahl, 2016: Axisymmetric tornado simulations at high Reynolds number. *J. Atmos. Sci.*, **73**, 3843-3854.
- Huang, C.-Y., C.-A. Chen, S.-H. Chen, and D. S. Nolan, 2016: On the upstream track deflection of tropical cyclones past a mountain ridge: Idealized experiments. *J. Atmos. Sci.*, **73**, 3157-3180.
- *Blanco, J. E., D. S. Nolan, and B. E. Mapes, 2016: Convectively coupled Kelvin waves in aquachannel simulations: 2. Life cycle and dynamical-convective coupling, *J. Geophys. Res. Atmos.*, **121**, 11,319–11,347.
- *Blanco, J. E., D. S. Nolan, and S. N. Tulich, 2016: Convectively coupled Kelvin waves in aquachannel simulations: 1. Propagation speeds, composite structures, and comparison with aquaplanets, *J. Geophys. Res. Atmos.*, **121**, 11,287–11,318.
- Finocchio, P. M., S. J. Majumdar, D. S. Nolan, and M. Iskandarani, 2016: Idealized tropical cyclone responses to height and depth of environmental wind shear. *Mon. Wea. Rev.*, **144**, 2155-2175.
- Nolan, D. S., S. N. Tulich, and J. E. Blanco, 2016: ITCZ structure as determined by parameterized versus explicit convection in aquachannel and aquapatch simulations. *J. Adv. Model. Earth. Syst.*, **8**, doi: 10.1002/2015MS000560.

- *Onderlinde, M. J., and D. S. Nolan, 2016: Tropical cyclone-relative environmental helicity and the pathways to intensification in shear. *J. Atmos. Sci.*, **73**, 869-890.
- *Bhatia, K. T., and D. S. Nolan, 2015: Prediction of intensity model error (PRIME) for Atlantic basin tropical cyclones. *Wea. Forecasting*, **30**, 1845-1865.
- Zhang, J. A., D. S. Nolan, R. F. Rogers, and V. Tallapragada, 2015: Evaluating the impact of improvements in the boundary layer parameterization on hurricane intensity and structure forecasts in HWRF. *Mon. Wea. Rev.*, **143**, 3136-3155.
- Stern, D. P., J. L. Vigh, D. S. Nolan, and F. Zhang, 2015: Revisiting the relationship between eyewall contraction and intensification. *J. Atmos. Sci.*, **72**, 1283-1306.
- *Moon, Y., and D. S. Nolan, 2015: Spiral rainbands in a numerical simulation of Hurricane Bill (2009). Part II: Propagation of inner rainbands. *J. Atmos. Sci.*, **72**, 191-215.
- *Moon, Y., and D. S. Nolan, 2015: Spiral rainbands in a numerical simulation of Hurricane Bill (2009). Part I: Structures and comparisons to observations. *J. Atmos. Sci.*, **72**, 164-190.
- Kepert, J. D., and D. S. Nolan, 2014: Reply. *J. Atmos. Sci.*, **71**, 4692-4704.
- *Onderlinde, M. J., and D. S. Nolan, 2014: Environmental helicity and its effects on development and intensification of tropical cyclones. *J. Atmos. Sci.*, **71**, 4308-4320.
- Nolan, D. S., J. A. Zhang, and E. W. Uhlhorn, 2014: On the limits of estimating the maximum wind speeds in hurricanes. *Mon. Wea. Rev.*, **142**, 2814-2837.
- Stern, D. P., J. R. Brisbois, and D. S. Nolan, 2014: An expanded data set of hurricane eyewall sizes and slopes. *J. Atmos. Sci.*, **71**, 2747-2762.
- Nolan, D. S., R. Atlas, K. T. Bhatia, and L. R. Bucci, 2013: Development and validation of a hurricane nature run using the Joint OSSE Nature Run and the WRF model. *J. Adv. Model. Earth Syst.*, **5**, 1-24.
- *Bhatia, K. T., D. S. Nolan, 2013: Relating the skill of tropical cyclone intensity forecasts to the synoptic environment. *Wea. Forecasting*, **28**, 961-980.
- Rappin, E. D., D. S. Nolan, S. J. Majumdar, 2013: A highly configurable vortex initialization method for tropical cyclones. *Mon. Wea. Rev.*, **141**, 3556-3575.

- Nolan, D. S., 2013: On the use of Doppler-radar derived winds to estimate the secondary circulations of tornados. *J. Atmos. Sci.*, **70**, 1160-1171.
- Nolan, D. S., 2012: Three-dimensional instabilities in tornado-like vortices with secondary circulations. *J. Fluid Mech.*, **711**, 61-100.
- Nolan, D. S., and M. G. McGauley, 2012: Tropical cyclogenesis in wind shear: Climatological relationships and physical processes. *Cyclones: Formation, Triggers, and Control*. Kazuyoshi Oouchi and Hironori Fudeyasu, eds., Nova Science Publishers, Happaage, New York, pp. 1-36.
- Rozoff, C. M., D. S. Nolan, J. P. Kossin, F. Zhang, and J. Fang, 2012: The roles of an expanding wind field and inertial stability in tropical cyclone secondary eyewall formation. *J. Atmos. Sci.*, **69**, 2621-2643.
- #Rappin, E. D., and D. S. Nolan, 2012: The effect of vertical shear orientation on tropical cyclogenesis. *Q. J. R. Meteorol. Soc.*, **138**, 1035-1054.
- Uhlhorn, E. W., and D. S. Nolan, 2012: Observational undersampling in tropical cyclones and its impact on estimated intensity. *Mon. Wea. Rev.*, **140**, 825-840.
- *Stern, D. P., and D. S. Nolan, 2012: On the height of the warm core in tropical cyclones. *J. Atmos. Sci.*, **69**, 1657-1680.
- Kelly, D. L., D. Letson, F. Nelson, D. S. Nolan, and D. Solis, 2012: Evolution of subjective hurricane risk perceptions: A Bayesian approach. *Journal of Economic Behavior and Organization*, **81**, 644-663.
- Braun, S. A., J. A. Sippel, and D. S. Nolan, 2012: The impact of dry mid-level air on hurricane intensity in idealized simulations with no mean flow. *J. Atmos. Sci.*, **69**, 236-257.
- *McGauley, M. G., and D. S. Nolan, 2011: Measuring environmental favorableness for tropical cyclogenesis by statistical analysis of threshold parameters. *J. Climate.*, **24**, 5968-5997.
- Zhang, J. A., R. F. Rogers, D. S. Nolan, and F. D. Marks, Jr., 2011: On the characteristic height scales of the hurricane boundary layer. *Mon. Wea. Rev.*, **139**, 2523-2535.
- *Stern, D. P., and D. S. Nolan, 2011: On the vertical decay rate of the maximum tangential winds in tropical cyclones. *J. Atmos. Sci.*, **68**, 2073-2094.

- Yamaguchi, M., D. S. Nolan, M. Iskandarani, S. J. Majumdar, M. S. Peng, and C. A. Reynolds, 2010: Singular vectors for tropical cyclone-like vortices in a nondivergent barotropic framework. *J. Atmos. Sci.*, **68**, 2273-2291.
- Nolan, D. S., 2011: Evaluating environmental favorableness for tropical cyclone development with the method of point downscaling. *J. Adv. Model. Earth Syst.*, 3, Art. M08001, 28 pp.
- Nolan, D. S., S. W. Powell, C. Zhang, and B. E. Mapes, 2010: Idealized simulations of the ITCZ and its multi-level flows. *J. Atmos. Sci.*, **67**, 4028-4053.
- #Rappin, E. D., D. S. Nolan, and K. A. Emanuel, 2010: Thermodynamic control of tropical cyclogenesis in environments of radiative-convective equilibrium with shear. *Quart. J. Roy. Meteorol. Soc.*, **136**, 1954-1971.
- *Moon, Y., D. S. Nolan, and M. Iskandarani, 2010: On the use of two-dimensional flow to study secondary eyewall formation in tropical cyclones. *J. Atmos. Sci.*, **67**, 3765-3773.
- *Moon, Y., and D. S. Nolan, 2010: The dynamic response of the hurricane wind field to spiral rainband heating. *J. Atmos. Sci.*, **67**, 1779-1805.
- Colette, A., N. Leith, V. Daniel, E. Bellone, and D. S. Nolan, 2010: Using mesoscale simulations to train statistical models of tropical cyclone intensity over land. *Mon. Wea. Rev.*, **138**, 2058-2073.
- *Moon, Y., and D. S. Nolan, 2010: Do gravity waves transport angular momentum away from hurricanes? *J. Atmos. Sci.*, **67**, 117-135.
- Nolan, D. S., J. A. Zhang, and D. P. Stern, 2009: Evaluation of planetary boundary layer parameterizations in tropical cyclones by comparison of in-situ data and high-resolution simulations of Hurricane Isabel (2003). Part I: Initialization, maximum winds, and the outer core boundary layer. *Mon. Wea. Rev.*, **137**, 3651-3674.
- Nolan, D. S., D. P. Stern, and J. A. Zhang, 2009: Evaluation of planetary boundary layer parameterizations in tropical cyclones by comparison of in-situ data and high-resolution simulations of Hurricane Isabel (2003). Part II: Inner-core boundary layer and eyewall structure. *Mon. Wea. Rev.*, **137**, 3675-3698.
- *Stern, D. P., and D. S. Nolan, 2009: Reexamining the vertical structure of tangential winds in tropical cyclones: Observations vs. theory. *J. Atmos. Sci.*, **66**, 3579-3600.

- Fierro, A. O., R. F. Rogers, F. D. Marks, and D. S. Nolan, 2009: The impact of horizontal grid spacing on the microphysical and kinematic structures of strong tropical cyclones simulated with the WRF-ARW model. *Mon. Wea. Rev.*, **137**, 3717-3743.
- #Hodyss, D., and D. S. Nolan, 2008: The Rossby-inertia-buoyancy instability in baroclinic vortices. *Phys. Fluids.*, **20**, 096602.
- Nolan, D. S., and E. D. Rappin, 2008: Increased sensitivity of tropical cyclogenesis to wind shear in higher SST environments. *Geophys. Res. Lett.*, **35**, L14805, doi:10.1029/2008GL034147.
- Zhang, C., D. S. Nolan, C. D. Thorncroft, and H. Nguyen, 2008: Shallow meridional circulations in the tropical atmosphere. *J. Climate*, **21**, 3453-3470.
- Nolan, D. S., 2007: What is the trigger for tropical cyclogenesis? *Aust. Meteorol. Mag.*, **56**, 241-266.
- Nolan, D. S., E. D. Rappin, and K. A. Emanuel, 2007: Tropical cyclogenesis sensitivity to environmental parameters in radiative-convective equilibrium. *Q. J. Roy. Meteorol. Soc.*, **133**, 2085-2107.
- Nolan, D. S., Y. Moon, and D. P. Stern, 2007: Tropical cyclone intensification from asymmetric convection: Energetics and efficiency. *J. Atmos. Sci.*, **64**, 3377-3405.
- #Hodyss, D., and D. S. Nolan, 2007: Linear anelastic equations for atmospheric vortices. *J. Atmos. Sci.*, **64**, 2947-2959.
- Nolan, D. S., C. Zhang, and S.-H. Chen, 2007: Dynamics of the shallow circulation around ITCZ regions. *J. Atmos. Sci.*, **64**, 2262-2285.
- Nolan, D. S., 2005: A new scaling for tornado-like vortices. *J. Atmos. Sci.*, **62**, 2639-2645.
- Nolan, D. S., 2005: Instabilities in hurricane-like boundary layers. *Dyn. Atmos. Oceans*, **40**, 209-236.
- Kniewicz, J. C., D. S. Nolan, and J. P. Kossin, 2004: An assessment of the balance in a meso-scale vortex within a midlatitude, continental mesoscale convective system. *J. Atmos. Sci.*, **61**, 1827-1832.

- Baidya Roy, S., C. P. Weaver, D. S. Nolan, and R. Avissar, 2003: A preferred scale for landscape forced mesoscale circulations? *J. Geophys. Res.*, **108**(D22), 8854, doi:10.1029/2002JD003097.
- Nolan, D. S., and L. D. Grasso, 2003: Nonhydrostatic, three-dimensional perturbations to balanced, hurricane-like vortices. Part II: Symmetric response and nonlinear simulations. *J. Atmos. Sci.*, **60**, 2717-2745.
- Nolan, D. S., and M. T. Montgomery, 2002: Nonhydrostatic, three-dimensional perturbations to balanced, hurricane-like vortices. Part I: Formulation, linearized evolution, and stability. *J. Atmos. Sci.*, **59**, 2989-3020.
- Nolan, D. S., M. T. Montgomery, and L. D. Grasso, 2001: The wavenumber one instability and trochoidal motion of hurricane-like vortices. *J. Atmos. Sci.*, **58**, 3243-3270.
- Nolan, D. S., 2001: The stabilizing effects of axial stretching on turbulent vortex dynamics. *Phys. Fluids.*, **13**, 1724-1738.
- Nolan, D. S., and M. T. Montgomery, 2000: The algebraic growth of wavenumber one disturbances in hurricane-like vortices. *J. Atmos. Sci.*, **57**, 3514-3538.
- Nolan, D. S., and B. F. Farrell, 1999: The intensification of two-dimensional swirling flows by stochastic asymmetric forcing. *J. Atmos. Sci.*, **56**, 3937-3962.
- Nolan, D. S., and B. F. Farrell, 1999: The structure and dynamics of tornado-like vortices. *J. Atmos. Sci.*, **56**, 2908-2936.
- Nolan, D. S., and B. F. Farrell, 1999: Generalized stability analyses of asymmetric disturbances in one- and two-celled vortices maintained by radial inflow. *J. Atmos. Sci.*, **56**, 1282-1307.

Non-refereed publications:

- Nolan, D. S., M. Yamaguchi, C. Sampson, D. P. Stern, R. McTaggart-Cowan, and C. Evans, 2019: Tropical Cyclone Structure Analysis and Change. Topic Report 4, 8th International Workshop on Tropical Cyclones, World Meteorological Organization.
- Nolan, D. S., and B. W. Klotz, 2017: Guidance for adjustments to in-situ observations of wind and pressure over the tropical cyclone life cycle. Delivered to the National Hurricane Center.

Kepert, J. D., M. Foley, J. Hawkins, D. S. Nolan, M. Peng, R. Smith, Y. Wang, and S. Westrelin, 2006: Tropical cyclone inner core dynamics. Topic reports, *Sixth International Workshop on Tropical Cyclones*, World Meteorological Organization, pp. 79-119.

Knutson, T. R., K. Emanuel, S. Emori, J. Evans, G. Holland, C. Landsea, K.-B. Liu, R. E. MacDonald, D. S. Nolan, M. Sugi, and Y. Wang, 2006: Possible relationships between climate change and tropical cyclone activity. Topic reports, *Sixth International Workshop on Tropical Cyclones*, World Meteorological Organization, pp. 464-492.

Nolan, D. S., A. S. Almgren, J. B. Bell, 2000: Studies of the relationship between environmental forcing and the structure and dynamics of tornado-like vortices. *Lawrence Berkeley National Laboratory Report no. LBNL-47554*.

Nolan, D. S., 1996: *Axisymmetric and Asymmetric Vortex Dynamics in Convergent Flows*. Ph.D. Thesis, Department of Earth and Planetary Sciences, Harvard University.

Selected Invited Talks:

November 2018: Invited seminar at the Nanjing University for Information Science and Technology.

November 2018: Invited seminar at Nanjing University.

November, 2018: Three invited seminars at the Shanghai Typhoon Institute, Shanghai, China.

March, 2017: Departmental seminar at the School of Meteorology, University of Oklahoma.

January, 2016: Weekly seminar at the National Center for Atmospheric Research, Boulder, Colorado.

March, 2015: Invited seminar at the Bureau of Meteorology, Melbourne, Australia.

October, 2014: Weekly seminar at the Department of Atmospheric Sciences, National Taiwan University.

November, 2013: Monthly seminar at the Department of Earth, Atmospheric, and Planetary Sciences, MIT.

October, 2013: Applied Mathematics Seminar, Department of Mathematics, UC Berkeley.

November 2012: Seminar at the Meteorological Research Institute in Tsukuba, Japan.

August 2012: HFIP Model Physics Workshop at the National Centers for Environmental Prediction, College Park, Maryland.

August 2012: Seminar at the National Hurricane Center, Miami, Florida.

March 2012: Invited talk at at the Workshop on Convection, Water Vapor, and Climate, Harvard University.

November, 2011: Seminar at the Department of Atmospheric Sciences at the University of Albany, New York.

August 2011: Seminar at the National Hurricane Center, Miami, Florida.

August 2011: Invited talk at the Hurricane Forecast Improvement Project (HFIP) Physics Workshop, Camp Springs, Maryland.

July 2011: Invited talk at the International Union of Geodesy and Geophysics, Melbourne, Australia.

February 2011: Seminar at the Mathematics Department, Lawrence Berkeley National Laboratory, Berkeley, California.

November, 2010: Seminar at the Department of Atmospheric Sciences, University of Illinois Urbana-Champaign.

September 2010: Invited talk at the First International Workshop on Nonhydrostatic Modeling, Kyoto, Japan.

September 2010: Seminar at the Department of Geophysics, Tohoku University, Sendai, Japan.

August 2009: Seminar at the National Hurricane Center, Miami, Florida.

March 2009: Invited talk for the conference “Sustainability: The Next Horizon,” at Florida Institute of Technology.

September 2008: Invited talk for the conference “Mesoprocesses in Meteorology and Air Pollution,” at Odessa State Environmental University, Odessa, Ukraine.

March 2008: Seminar at the Department of Earth and Planetary Sciences, Harvard University.

February 2008: Invited talk for the Institute for Mathematics Applied to Geosciences “Theme-of-the-Year” workshop, National Center for Atmospheric Research, Boulder, Colorado.

November 2007: Invited talk for the “Angular Momentum Transport in Laboratory and Nature” mini-conference at the Division of Plasma Physics meeting of the American Physical Society, Orlando, Florida.

September 2007: Seminar at the Department of Atmospheric Sciences, University of Washington.

April 2007: Seminar for the IGERT program, Columbia University.

Extended Abstracts and Preprints:

Hlywiak, J. A., and D. S. Nolan, 2018: Coupled 3D numerical simulations and the effects of ocean salinity on TC intensity. *Preprints, 33rd AMS Conference on Hurricanes and Tropical Meteorology*, Ponte Vedra, Florida.

Evans, R. C., and D. S. Nolan, 2018: The response of tropical cyclones to diurnal heating as seen in a linear dynamical model. *Preprints, 33rd AMS Conference on Hurricanes and Tropical Meteorology*, Ponte Vedra, Florida.

Wu, S.-N., B. J. Soden, D. S. Nolan, and Y. Miyamoto, 2018: Signature of Tropical Cyclone Intensification: An Assessment of Frozen Water Content in Numerical Simulations. *Preprints, 33rd AMS Conference on Hurricanes and Tropical Meteorology*, Ponte Vedra, Florida.

Blanco, J. E., and D. S. Nolan, 2016: Decoupling of convectively coupled Kelvin waves: Super cloud clusters versus moist Kelvin waves. *Preprints, 32nd AMS Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico.

Onderlinde, M. J., and D. S. Nolan, 2016: The tropical cyclone to smoothly changing wind shear using the method of time-varying point-downscaling. *Preprints, 32nd AMS Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico.

Onderlinde, M. J., and D. S. Nolan, 2016: Tropical cyclone-relative environmental helicity and the pathways to intensification in shear. *Preprints, 32nd AMS Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico.

Nolan, D. S., and C. A. Mattocks, 2014: Development and evaluation of the second hurricane nature run using the Joint OSSE nature run and the WRF model. *Preprints, 31st AMS Conference on Hurricanes and Tropical Meteorology*, San Diego, California.

- Kepert, J. D., and D. S. Nolan, 2014: Analysis of a simulated tropical cyclone eyewall replacement cycle. *Preprints, 31st AMS Conference on Hurricanes and Tropical Meteorology*, San Diego, California.
- Bhatia, K., and D. S. Nolan, 2014: Predicting tropical cyclone intensity error. *Preprints, 31st AMS Conference on Hurricanes and Tropical Meteorology*, San Diego, California.
- Blanco, J. E., D. S. Nolan, and S. N. Tulich, 2014: Sensitivity of a simulated convectively coupled Kelvin wave to physics schemes and resolution with an idealized tropical channel. *Preprints, 31st AMS Conference on Hurricanes and Tropical Meteorology*, San Diego, California.
- Finocchio, P. M., S. J. Majumdar, and D. S. Nolan, 2014: Sensitivity of developing tropical cyclones to initial vortex depth and the height of environmental dry air. *Preprints, 31st AMS Conference on Hurricanes and Tropical Meteorology*, San Diego, California.
- Onderlinde, M. J., and D. S. Nolan, 2014: Environmental helicity and its effect on development and intensification of tropical cyclones. *Preprints, 31st AMS Conference on Hurricanes and Tropical Meteorology*, San Diego, California.
- Moon, Y., and D. S. Nolan, 2012: Spiral rainband propagation: Vortex-Rossby waves vs. tropical squall lines. *Preprints, 30th AMS Conference on Hurricanes and Tropical Meteorology*, Ponte Vedra Beach, Florida.
- Bhatia, K., and D. S. Nolan, 2012: Predicting the performance of tropical cyclone intensity forecasts using environmental parameters. *Preprints, 30th AMS Conference on Hurricanes and Tropical Meteorology*, Ponte Vedra Beach, Florida.
- Onderlinde, M., and D. S. Nolan, 2012: Comparison of the intensity evolution during Tropical Storms Gabrielle (2001) and Edouard (2002) using the method of point downscaling in a high resolution model. *Preprints, 30th AMS Conference on Hurricanes and Tropical Meteorology*, Ponte Vedra Beach, Florida.
- Stern, D. P., David. S. Nolan, and S. D. Aberson, 2008: Simulations and observations of extreme low-level updrafts in Hurricane Isabel (2003). *Preprints, 28th AMS Conference on Hurricanes and Tropical Meteorology*, Orlando, Florida.

- Moon, Y., and D. S. Nolan, 2008: The dynamic response of the hurricane wind field to rain-band heating. Part II: Comparison to RAINEX observations and high-resolution simulations. *Preprints, 28th AMS Conference on Hurricanes and Tropical Meteorology*, Orlando, Florida.
- Moon, Y., and D. S. Nolan, 2007: Do gravity waves transport angular momentum away from hurricanes? *Preprints, 16th Conference on Atmospheric and Oceanic Fluid Dynamics*, American Meteorological Society, Santa Fe, NM.
- Stern, D. P., and D. S. Nolan, 2007: The vertical structure of tangential winds in tropical cyclones: Theory vs. observations. *Preprints, 12th AMS Conference on Mesoscale Processes*, Waterville Valley, NH.
- Moon, Y., and D. S. Nolan, 2006: The intensification of cyclones from asymmetric heating revisited: Energetics and weakly nonlinear effects. *Preprints, 27th AMS Conference on Hurricanes and Tropical Meteorology*, Monterey, CA, April, 2006.
- Stern, D. P., and D. S. Nolan, 2006: Kinetic energy efficiencies of idealized developing tropical cyclones. *Preprints, 27th AMS Conference on Hurricanes and Tropical Meteorology*, Monterey, CA, April, 2006.
- Nolan, D. S., E. D. Rappin, and K. A. Emanuel, 2006: Could hurricanes form from random convection in a warmer world? *Preprints, 27th AMS Conference on Hurricanes and Tropical Meteorology*, Monterey, CA, April, 2006.
- Nolan, D. S., 2004: Vortex sheets, vortex rings, and a mesocyclone. *Preprints, 22nd AMS Conference on Severe Local Storms*, Hyannis, MA, October 2004.
- Nolan, D. S., M. A. Bender, T. P. Marchok, S. T. Garner, and C. L. Kerr, 2004: Simulations of Hurricane Isabel (2003) in the WRF, GFDL, and ZETAC models. *Preprints, 5th Annual WRF User's Workshop*, Boulder, June, 2004.
- Emanuel, K. A., and D. S. Nolan, 2004: Tropical cyclone activity and the global climate system. *Preprints, 26th AMS Conference on Hurricanes and Tropical Meteorology*, Miami Beach, May, 2004.
- Nolan, D. S., 2004: Mechanics and efficiency of symmetric and asymmetric intensification processes. *Preprints, 26th AMS Conference on Hurricanes and Tropical Meteorology*, Miami Beach, May, 2004.

- Moore, C. W., D. S. Nolan, and D. S. Schaffer, 2004: Coupling atmosphere and ocean models for the study of hurricane-like vortex generation. *Eos Trans. AGU*, **84(52)**, Ocean Sci. Meet. Suppl., Abstract OS41D-09.
- Nolan, D. S., 2003: Instabilities in swirling boundary layers. *Preprints, 14th AMS Conference on Atmospheric and Oceanic Fluid Dynamics*, San Antonio, TX, June, 2003.
- Nolan, D. S., and M. T. Montgomery, 2002: Three-dimensional stability analyses of tornado-like vortices with secondary circulations. *Preprints, 21st AMS Conference on Severe Local Storms*, San Antonio, TX, August, 2002.
- Baidya Roy, S., C. P. Weaver, D. S. Nolan, and R. Avissar, 2002: A preferred dynamical scale for landscape-forced mesoscale circulations? *Preprints, AMS/GAPP Mississippi River Climate and Hydrology Conference*, New Orleans, LA, May 2002.
- Nolan, D. S., and R. E. Tuleya, 2002: Preliminary comparisons of tropical cyclone simulations in the GFDL and WRF Models. *Preprints, 25th Conference on Hurricanes and Tropical Meteorology*, San Diego, CA, May, 2002.
- Nolan, D. S., and M. T. Montgomery, 2002: From asymmetric heating to axisymmetric intensification. *Preprints, 25th Conference on Hurricanes and Tropical Meteorology*, San Diego, CA, May, 2002.
- Nolan, D. S., and M. T. Montgomery, 2000: Three-dimensional asymmetric eigenmodes of balanced, hurricane-like vortices. *Preprints, 24th AMS Conference on Hurricanes and Tropical Meteorology*, Fort Lauderdale, FL, May, 2000.
- Nolan, D. S., M. T. Montgomery, and P. D. Reasor, 2000: Studies of the wavenumber one instability in hurricane-like vortices. *Preprints, 24th AMS Conference on Hurricanes and Tropical Meteorology*, Fort Lauderdale, FL, May, 2000.
- Nolan, D. S., and M. T. Montgomery, 1999: The role of vortex-Rossby waves in the algebraic growth of wavenumber one disturbances in hurricane-like vortices. *Preprints, 12th AMS Conference on Atmospheric and Oceanic Fluid Dynamics*, June, 1999, New York City, NY.
- Nolan, D. S., 1999: Vortex stabilization in deformation fields. *Preprints, 12th AMS Conference on Atmospheric and Oceanic Fluid Dynamics*, June, 1999, New York City, NY.

Nolan, D. S., and B. F. Farrell, 1998: The Reynolds number dependence of the flow structure and maximum windspeeds in tornado-like vortices. *Preprints, 19th AMS Conference on Severe Local Storms, September, 1998, Minneapolis, MN.*

Nolan, D. S., and B. F. Farrell, 1998: The intensification of two-dimensional swirling flows by stochastic asymmetric forcing. *Preprints of the Rossby-100 Symposium, June 1998, Stockholm, Sweden.*