

Gary M. Lackmann, Ph.D.

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Curriculum Vitae
August 2024

EDUCATION

- 1995 **University at Albany**, Albany, New York
Ph.D., Atmospheric Science (*Life Cycles of Mobile Upper Troughs and Maritime Cyclones during ERICA*, D. Keyser and L. Bosart)
- 1989 **University of Washington**, Seattle, Washington
M.S., Atmospheric Science (*Atmospheric Structure and Momentum Balance during a Gap-Wind Event in Shelikof Strait, Alaska*, J. Overland)
- 1986 **B.S.**, Atmospheric Science

PROFESSIONAL APPOINTMENTS

- 2024– *Department Head*, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University
- 2023–2024 *Interim Department Head*, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University
- 2021– *Alumni Association Distinguished Undergraduate Professor*, North Carolina State University, Raleigh, NC
- 2009– *Professor*, North Carolina State University, Raleigh, NC
- 2011–2016 *Director of Graduate Programs*, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University, Raleigh, NC (Co-Director 2015–2016)
- 2004–2009 *Associate Professor*, North Carolina State University, Raleigh, NC
- 1999–2004 *Assistant Professor*, North Carolina State University, Raleigh, NC
- 1996–1999 *Assistant Professor*, State University of New York, College at Brockport, NY
- 1995–1996 *Postdoctoral Scientist*, McGill University, Montreal, Quebec, Canada
- 1988–1989 *Physical Scientist*, Naval Postgraduate School, Monterey, CA
- 1985–1988 *Physical Scientist*, NOAA/Pacific Marine Environmental Lab., Seattle, WA

LEADERSHIP (SELECTED)

Department Head, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University (August 2023 – present)

- Worked with faculty to develop and implement buy-out and teaching load policies
- Emphasis on alumni relations and fundraising, via alumni receptions and social media

Editor-in-Chief, *Weather and Forecasting*, Publications Commission member (2017–2023)

- Proposed and led task force for design and implementation of *significance statements* for all AMS journals
- Updated journal Terms of Reference, expanded scope

Councilor, American Meteorological Society (2018–2020, elected, vote of Society)

- Advanced development and update of the [AMS Code of Conduct](#)
- Co-chaired task force to confront harassment, discrimination, and bullying (with M. Burt)

Director of Graduate Programs, Dept. of Marine, Earth, and Atmospheric Science (2011–2016)

- Designed & implemented 1st Year Graduate Seminar, an orientation for incoming students

HONORS AND AWARDS (SELECTED)

2021 Alumni Association Distinguished Undergraduate Professor, North Carolina State University
 2019 Fellow, American Meteorological Society (elected)
 2015 T. Theodore Fujita Research Achievement Award, National Weather Association¹
 2014 Edward N. Lorenz Teaching Excellence Award, American Meteorological Society
 2013 Alumni Association Outstanding Teacher Award, North Carolina State University
 2012 – 2013 Outstanding Teacher Award, North Carolina State University
 2011 – present: Member, Academy of Outstanding Teachers, North Carolina State University
 2012 Gold Excel Award, Association Media & Publishing (technical book category) for
Midlatitude Synoptic Meteorology: Dynamics, Analysis, & Forecasting (AMS/U. Chicago)
 2004 LeRoy and Elva Martin Award for Teaching Excellence, North Carolina State University
 2003 National Weather Service Award for Collaborative Research, NOAA
 2003 Editor's Award, *Monthly Weather Review*, American Meteorological Society

TEXTS

Lackmann, G. M., 2011: *Midlatitude Synoptic Meteorology: Dynamics, Analysis, and Forecasting* (2011, *Amer. Meteor. Soc./U. Chicago Press*), 345 pp.
 Lackmann, G. M., B. E. Mapes, and K. Tyle, 2017: *Synoptic-Dynamic Meteorology Lab Manual: Visual Exercises to Complement Midlatitude Synoptic Meteorology*. (2017, *Amer. Meteor. Soc./U. Chicago Press*), 120 pp.

REFEREED PUBLICATIONS

[Google scholar profile](#)

Lead author underlined if current or former student advisee of Lackmann

- (77) Keaveney, C. W., G. M. Lackmann, and T. E. Dowling, 2024: Effect of transient vortex interactions on the size and strength of Jupiter's Great Red Spot. *Icarus*, **420**, 116196, ISSN 0019-1035, <https://doi.org/10.1016/j.icarus.2024.116196>.
- (76) Campbell, T. A., G. M. Lackmann, M. J. Molina, and M. D. Parker, 2024: Severe convective storms in limited instability organized by pattern and distribution. *Wea. Forecasting*, **39**, 217–240.
- (75) Radford, J. T., G. M. Lackmann, J. Goodwin, J. Correia, Jr., and K. Harnos, 2023: An iterative approach towards development of ensemble visualization techniques for high-impact winter weather hazards. Part 2: Product evaluation. *Bull. Amer. Met. Soc.*, **104**, E1649–E1669.
- (74) Radford, J. T., G. M. Lackmann, J. Goodwin, J. Correia, Jr., and K. Harnos, 2023: An iterative approach towards development of ensemble visualization techniques for high-impact winter weather hazards. Part 1: Product development. *Bull. Amer. Met. Soc.*, **104**, E1630–E1648.
- (73) Radford, J. T., and G. M. Lackmann, 2023: Assessing variations in the predictive skill of ensemble snowband forecasts with object-oriented verification and self-organizing maps. *Wea. Forecasting*, **38**, 1673–1693.
- (72) Radford, J. T., and G. M. Lackmann, 2023: Improving high-resolution ensemble forecast (HREF) system mesoscale snowband forecasts with random forests. *Wea. Forecasting*, **38**, 1695–1706.
- (71) Chase, R. J., D. R. Harrison, G. M. Lackmann, and A. McGovern, 2023: A machine learning

¹Group award to NCSU faculty and NOAA CSTAR partners for “15 years of collaborative operations-to-research and research-to-operations contributions”.

- tutorial for operational meteorology, part II: Neural networks and deep learning. *Wea. Forecasting*, **38**, 1271–1293. <https://doi.org/10.1175/WAF-D-22-0187.1>
- (70) Jung, C. and G. M. Lackmann, 2023: Changes in tropical cyclones undergoing extratropical transition in a warming climate: Quasi-idealized numerical experiments of North Atlantic landfalling events. *Geophys. Res. Lett.*, **50**, e2022GL101963. <https://doi.org/10.1029/2022GL101963>
- (69) Turnau, R., W. A. Robinson, G. M. Lackmann, and A. Michaelis, 2022: Model projections of increased severity of heat waves in Eastern Europe. *Geophys. Res. Lett.*, **49**(22), e2022GL100183, DOI: 10.1029/2022GL100183
- (68) Chase, R. J., D. R. Harrison, A. Burke, G. M. Lackmann, and A. McGovern, 2022: A machine learning tutorial for operational meteorology, part 1: Traditional machine learning. *Wea. Forecasting*, **37**, 1509–1539.
- (67) Zick, S., C. Matyas, G. M. Lackmann, J. Tang, and B. Bennett, 2022: Illustration of an object-based approach to identify structural differences in tropical cyclone wind fields. *Quart. J. Roy. Meteor. Soc.*, **148**, 2587–2606.
- (66) Stuart, N. A., G. Hartfield, D. M. Schultz, K. Wilson, G. West, R. Hoffman, G. M. Lackmann, H. Brooks, P. Roebber, T. Bals-Elsholz, H. Obermeier, F. Judt, P. Market, D. Nietfeld, B. Telfeyan, D. Depodwin, J. Fries, E. Abrams, J. Shields, 2022: The Evolving Role of Humans in Weather Prediction and Communication. *Bull. Amer. Meteor. Soc.*, **103**, E1720–E1746. <https://doi.org/10.1175/BAMS-D-20-0326.1>
- (65) Done, J. M., G. M. Lackmann, and A. F. Prein, 2022: The response of tropical cyclone intensity to changes in environmental temperature. *Wea. Clim. Dyn.*, **3**, 693–711.
- (64) Lackmann, G. M., R. L. Miller, A. C. Michaelis, and W. A. Robinson, 2021: Persistent anomaly changes in high-resolution climate simulations. *J. Climate*, **34**, 5425–5442.
- (63) Green Jr, T. A., D. Leins, G. M. Lackmann, J. Morrow, and J. Blaes, 2021: The National Weather Service-North Carolina State University internship course: Impacts and success over a generation. *Bull. Amer. Met. Soc.*, **102**, E2079–E2085.
- (62) Tierney, G. T., W. A. Robinson, and G. M. Lackmann, 2021: The sensitivity of persistent geopotential anomalies to the climate of a moist channel model. *J. Climate*, **34**, 5093–5108.
- (61) Michaelis, A. C., and G. M. Lackmann, 2021: Storm-scale dynamical changes of extratropical transition events in present-day and future high-resolution global simulations. *J. Climate*, **34**, 5037–5062.
- (60) Jung, C., and G. M. Lackmann, 2021: The response of extratropical transition of tropical cyclones to climate change: Quasi-idealized numerical experiments. *J. Climate*, **34**, 4361–4381.
- (59) Kunkel, K. E., D. R. Easterling, A. Ballinger, S. Bililign, S. M. Champion, D. R. Corbett, K. D. Dello, J. Dissen, G. M. Lackmann, R. A. Luettich, Jr., L. B. Perry, W. A. Robinson, L. E. Stevens, B. C. Stewart, and A. J. Terando, 2020: *North Carolina Climate Science Report*. North Carolina Institute for Climate Studies, 233 pp. <https://ncics.org/nccsr>
- (58) Miller, R. L., G. M. Lackmann, and W. A. Robinson, 2020: A new variable-threshold persistent anomaly index: Northern Hemisphere anomalies in the ERA-Interim reanalysis. *Mon. Wea. Rev.*, **147**, 43–62.
- (57) Michaelis, A. C., and G. M. Lackmann, 2019: Climatological changes in the extratropical transition of tropical cyclones in high-resolution global simulations. *J. Climate*, **32**, 8733–8753.
- (56) Michaelis, A. C., G. M. Lackmann, and W. A. Robinson, 2019: Evaluation of a unique approach to high-resolution climate modeling using the Model for Prediction Across Scales – Atmosphere (MPAS-A) version 5.1, *Geosci. Model Dev.*, **12**, 3725–3743.
- (55) Lackmann, G. M. and G. Thompson, 2019: Hydrometeor lofting and mesoscale snowbands. *Mon. Wea. Rev.*, **147**, 3879–3899.

- (54) Radford, J. T., G. M. Lackmann, and M. A. Baxter, 2019: An evaluation of snowband predictability in the High-Resolution Rapid Refresh. *Wea. Forecasting*, **34**, 1477–1494.
- (53) Jung, C., and G. M. Lackmann, 2019: Extratropical transition of Hurricane Irene (2011) in a changing climate. *J. Climate*, **32**, 4847–4871.
- (52) Wanik, D. W., E. N. Anagnostou, M. Astitha, B. M. Hartman, J. Yang, D. Cerrai, J. He, and M. E. B. Frediani, 2018: A case study on power outage impacts from future Hurricane Sandy scenarios. *J. Appl. Meteor. Climatol.*, **57**, 51–79. doi:10.1175/JAMC-D-16-0408.1.
- (51) Marciano, C. G., and G. M. Lackmann, 2017: The South Carolina Flood of October 2015: Moisture transport analysis and the role of Hurricane Joaquin. *J. Hydrometeorol.*, **18**, 2973–2990.
- (50) Michaelis, A., J. A. Willison, G. M. Lackmann, and W. A. Robinson, 2017: Changes in winter North Atlantic extratropical cyclones in high-resolution regional pseudo-global warming simulations. *J. Climate*, **30**, 6905–6925.
- (49) King, J., M. Parker, K. Sherburn, and G. Lackmann, 2017: Rapid evolution of cool season, low CAPE severe thunderstorm environments. *Wea. Forecasting*, **32**, 763–779. doi:10.1175/WAF-D-16-0141.1
- (48) Sherburn, K. D., M. D. Parker, J. R. King, and G. M. Lackmann, 2016: Composite environments of severe and non-severe high-shear, low-CAPE convective events. *Wea. Forecasting*, **31**, 1899–1927. doi:10.1175/WAF-D-16-0086.1.
- (47) Lackmann, G. M., 2015: Hurricane Sandy before 1900, and after 2100. *Bull. Amer. Meteor. Soc.*, **96**, 547–560.
- (46) Willison, J., W. Robinson, and G. M. Lackmann, 2015: North Atlantic stormtrack sensitivity to warming increase with model resolution. *J. Climate*, **28**, 468–484.
- (45) Marciano, C. G., G. M. Lackmann, and W. A. Robinson, 2015: Changes in U.S East Coast cyclone dynamics with climate change. *J. Climate*, **28**, 468–484.
- (44) Baxter, M. A., G. M. Lackmann, K. M. Mahoney, T. E. Workoff, and T. M. Hamill, 2014: Verification of quantitative precipitation reforecasts over the Southeast United States. *Wea. Forecasting*, 1199–1207.
- (43) Michaelis, A., and G. M. Lackmann, 2013: Numerical modeling of a historic storm: Simulating the Blizzard of 1888. *Geophys. Res. Lett.*, 4092–4097. doi:10.1002/grl.50750.
- (42) Mallard, M. S., G. M. Lackmann, and A. Ayyer, 2013: Atlantic hurricanes and climate change. Part II: Role of thermodynamic changes in decreased hurricane frequency. *J. Climate*, **26**, 8513–8528.
- (41) Mallard, M. S., G. M. Lackmann, A. Ayyer, and K. A. Hill, 2013: Atlantic hurricanes and climate change. Part I: Experimental design and isolation of thermodynamic effects. *J. Climate*, **26**, 4876–4893.
- (40) Lackmann, G. M., 2013: The South-Central US flood of May 2010: Present and future. *J. Climate*, **26**, 4688–4709.
- (39) Willison, J., W. Robinson, and G. Lackmann, 2013: The importance of resolving mesoscale latent heating in the North Atlantic stormtrack. *J. Atmos. Sci.*, **70**, 2234–2250.
- (38) Tang, Q., L. Xie, G. Lackmann, and B. Liu, 2013: Modeling the impacts of the large-scale atmospheric environment on inland flooding during the landfall of Hurricane Floyd (1999). *Adv. Meteor.*, Article ID 294956, 16 pages. doi:10.1155/2013/294956.
- (37) Hill, K. A., and G. M. Lackmann, 2011: The impact of future climate change on TC intensity and structure: A downscaling approach. *J. Climate*, **24**, 4644–4661.
- (36) Mahoney, K. M., and G. M. Lackmann, 2011: The impact of environmental moisture on momentum transport in simulations of a mesoscale convective system. *Mon. Wea. Rev.*, **139**, 1352–1369.
- (35) Etherton, B. A., S. C. Arms, L. D. Oolman, G. M. Lackmann, and M. Ramamurthy, 2011: Using operational and experimental observations in geoscience education (The 2009 Unidata Triennial Users Workshop). *Bull. Amer. Meteor. Soc.*, **92**, 477–480.
- (34) Gentry M. S., and G. M. Lackmann, 2010: Sensitivity of simulated tropical cyclone structure and intensity to horizontal resolution. *Mon. Wea. Rev.*, **138**, 688–704.

- (33) Mahoney, K. M., G. M. Lackmann, and M. D. Parker, 2009: The role of convective momentum transport in the motion of a quasi-idealized mesoscale convective system. *Mon. Wea. Rev.*, **137**, 3316–3338.
- (32) Hill, K. A., and G. M. Lackmann, 2009a: Influence of environmental humidity on tropical cyclone size. *Mon. Wea. Rev.*, **137**, 3294–3315.
- (31) Hill, K. A., and G. M. Lackmann, 2009b: Analysis of idealized tropical cyclone simulations using the Weather Research and Forecasting Model: Sensitivity to turbulence parameterization and grid spacing. *Mon. Wea. Rev.*, **137**, 745–765.
- (30) Keighton, S., L. Lee, B. Holloway, D. Hotz, S. Zubrick, J. Hovis, G. Votaw, L. B. Perry, G. Lackmann, S. Yuter, C. Konrad, D. Miller, B. Etherton, 2009: A Collaborative Approach to Study Northwest Flow Snow in the Southern Appalachians. *Bull. Amer. Meteor. Soc.*, **90**, 979–991.
- (29) Jacobs, N. A., S. Raman, G. M. Lackmann, and P. P. Childs Jr., 2008: The influence of Gulf Stream induced SST gradients on the US East Coast winter storm of 24-25 January 2000. *Inter. J. Remote Sensing*, **29**:21, 6145–6174.
- (28) Brennan, M. J., G. M. Lackmann, and K. M. Mahoney, 2008: Potential vorticity (PV) thinking in operations: The utility of non-conservation. *Wea. Forecasting*, **23**, 168–182.
- (27) Mahoney, K. M., and G. M. Lackmann, 2007: The Effect of Upstream Convection on Downstream Precipitation. *Wea. Forecasting*, **22**, 255–277.
- (26) Palmieri, R., L. Tredway, D. Niyogi, and G. M. Lackmann, 2006: Development and evaluation of a forecasting system for fungal disease in turfgrass. *Met. Applications*, **13**, 405–416.
- (25) Brennan, M. J., and G. M. Lackmann, 2006: Observational diagnosis and model forecast evaluation of unforecasted incipient precipitation during the 24–25 January 2000 East Coast cyclone. *Mon. Wea. Rev.*, **134**, 2033–2054.
- (24) Stuart, N. A., P. S. Market, B. Telfeyan, G. M. Lackmann, K. Carey, H. E. Brooks, D. Nietfeld, B. C. Motta, and K. Reeves, 2006: The future of humans in an increasingly automated forecast process. *Bull. Amer. Meteor. Soc.*, **87**, 1497–1502.
- (23) Mahoney, K. M., and G. M. Lackmann, 2006: The Sensitivity of Numerical Forecasts to Convective Parameterization: A Case Study of the 17 February 2004 East Coast Cyclone. *Wea. Forecasting*, **21**, 465–488.
- (22) Fuentes, M., L. Chen, J. Davis, and G. M. Lackmann, 2005: A new class of nonseparable and nonstationary covariance models for wind fields. *Environmetrics*, **16**, 449–464.
- (21) Jacobs, N. A., G. M. Lackmann, and S. Raman, 2005: The combined effects of Gulf Stream-induced baroclinicity and upper-level vorticity on U.S. East Coast extratropical cyclogenesis. *Mon. Wea. Rev.*, **133**, 2494–2501.
- (20) Brennan, M. J., and G. M. Lackmann, 2005: The influence of incipient latent heat release on the precipitation distribution of the 24–25 January 2000 U.S. East Coast cyclone. *Mon. Wea. Rev.*, **133**, 1913–1937.
- (19) Reeves, H. D., and G. M. Lackmann, 2004: An Investigation of the Influence of Latent Heat Release on Cold-Frontal Motion. *Mon. Wea. Rev.*, **132**, 2864–2881.
- (18) Lackmann, G. M., and R. M. Yablonsky, 2004: On the role of the precipitation mass sink in tropical cyclogenesis. *J. Atmos. Sci.*, **61**, 1674–1692.
- (17) Brennan, M. J., G. M. Lackmann, and S. E. Koch, 2003: An analysis of the impact of a split-front rainband on Appalachian cold-air damming. *Wea. Forecasting*, **18**, 712–731.
- (16) Bailey, C. M., G. Hartfield, G. M. Lackmann, K. Keeter, and S. Sharp, 2003: An objective climatology, classification scheme, and assessment of sensible weather impacts for Appalachian cold-air damming. *Wea. Forecasting*, **18**, 641–661.
- (15) Lackmann, G. M., K. Keeter, L. G. Lee, and M. B. Ek, 2002: Model representation of freezing and melting precipitation: Implications for winter weather forecasting. *Wea. Forecasting*, **17**, 1016–1033.
- (14) Lackmann, G. M. 2002: Potential vorticity redistribution, the low-level jet, and moisture transport in

- extratropical cyclones. *Mon. Wea. Rev.*, **130**, 59–74.
- (13) Lackmann, G. M., 2001: Analysis of a surprise western New York snowstorm. *Wea. Forecasting*, **16**, 99–116.
- (12) Lackmann, G. M., D. Keyser, and L. F. Bosart, 1999: Energetics of an intensifying midtropospheric jet streak during the Experiment on Rapidly Intensifying Cyclones over the Atlantic (ERICA). *Mon. Wea. Rev.*, **127**, 2777–2795.
- (11) Lackmann, G. M., and J. R. Gyakum, 1999: Heavy cold-season precipitation in the Northwestern United States: Synoptic climatology and an analysis of the flood of 17–18 January 1986. *Wea. Forecasting*, **14**, 687–700.
- (10) Henderson, J., G. M. Lackmann, and J. R. Gyakum, 1998: Analysis of hurricane Opal's forecast track using quasigeostrophic potential vorticity inversion. *Mon. Wea. Rev.*, **127**, 292–307.
- (9) Lackmann, G. M., J. R. Gyakum, and R. Benoit, 1998: Moisture transport diagnosis of a wintertime precipitation event in the Mackenzie River Basin. *Mon. Wea. Rev.*, **126**, 668–691.
- (8) Lackmann, G. M., D. Keyser, and L. F. Bosart, 1997: A characteristic evolution of upper-tropospheric cyclogenetic precursors during the Experiment on Rapidly Intensifying Cyclones over the Atlantic (ERICA). *Mon. Wea. Rev.*, **125**, 2529–2556.
- (7) Lackmann, G. M., and J. R. Gyakum, 1996: The synoptic- and planetary-scale signatures of precipitating systems over the Mackenzie River Basin. *Atmos.–Ocean*, **34**, 647–674.
- (6) Lackmann, G. M., L. F. Bosart, and D. Keyser, 1996: The synoptic- and planetary-scale environment for explosive wintertime cyclogenesis over the western North Atlantic Ocean. *Mon. Wea. Rev.*, **124**, 2672–2702.
- (5) Bosart, L. F., and G. M. Lackmann, 1995: Postlandfall tropical cyclone reintensification in a weakly baroclinic environment: A case study of hurricane David (September 1979). *Mon. Wea. Rev.*, **123**, 3268–3291.
- (4) Evans, M. S., D. Keyser, L. F. Bosart, and G. M. Lackmann, 1994: A satellite-derived classification scheme for rapid maritime cyclogenesis. *Mon. Wea. Rev.*, **122**, 1381–1416.
- (3) Ferber, G. K., C. F. Mass, G. M. Lackmann, and M. W. Patnoe, 1993: Snowstorms over the Puget Sound Lowlands. *Wea. Forecasting*, **8**, 481–504.
- (2) Lackmann, G. M., and J. Overland, 1989: Atmospheric structure and momentum balance during a gap-wind event in Shelikof Strait, Alaska. *Mon. Wea. Rev.*, **117**, 1817–1833.
- (1) Macklin, S. A., G. M. Lackmann, and J. Gray, 1988: Offshore-directed winds in the vicinity of Prince William Sound, Alaska. *Mon. Wea. Rev.*, **116**, 1289–1301.

THESES

Lackmann, G. M., 1995: Life Cycles of Mobile Upper Troughs and Maritime Cyclones during ERICA. Ph.D. Dissertation, Department of Earth and Atmospheric Sciences, University at Albany, State University of New York, 318 pp.

Lackmann, G. M., 1989: Atmospheric Structure and Momentum Balance during a Gap-Wind Event in Shelikof Strait, Alaska. M.S. Thesis, Department of Atmospheric Science, University of Washington, 65 pp.

OTHER PUBLICATIONS

Hollinger Beatty, K. E., G. M. Lackmann, and J. H. Bowden, 2024: How Will Precipitation Characteristics Associated with Tropical Cyclones in Diverse Synoptic Environments Respond to Climate Change? *EarthArXiv* (2024), <https://doi.org/10.31223/X52X23>

Bunkers, M., G. M. Lackmann, and co-authors, 2023: Advantages to Writing Shorter Articles. *Wea. Forecasting*, **38**, 389–390, <https://doi.org/10.1175/WAF-D-23-0022.1>

- Lackmann, G. M., 2020: Broadening the scope and impact of Weather and Forecasting. *Wea. Forecasting*, **35**, 3, <https://doi.org/10.1175/WAF-D-19-0246.1>.
- Lackmann, G. M., B. Ancell, M. Bunkers, B. Kirtman, K. Kosiba, A. McGovern, L. McMurdie, Z. Pu, E. Ritchie, and H. P. Huntington, 2020: Data availability principles and practice. *Wea. Forecasting*, **35**, 6.
- Huntington, H. P., and G. M. Lackmann, 2020: Stating the significance of our work. *Wea. Climate Soc.*, <https://doi.org/10.1175/WCAS-D-20-0066.1>.
- Orf, L., G. M. Lackmann, C. Herbster, A. Krueger, E. Cutrim, T. Whitaker, J. Steenburgh, and M. Voss, 2007: Models as educational tools. *Bull. Amer. Meteor. Soc.*, **88**, 1101–1104
- Brennan, M. J., K. Keeter, A. J. Riordan, and G. M. Lackmann, 2005: Expanding educational horizons with a National Weather Service-North Carolina State University internship course. *Bull. Amer. Meteor. Soc.*, **85**, 1407-1409.
- Lackmann, G. M. 2002: NWP Biases in freezing rain forecasts, *Bull. Amer. Meteor. Soc.* **83**, 1274–1275.
- Guth, M. A. S., G. M. Lackmann, S. E. Kennedy, and K. W. Appel, 2002: Weather Research for Trading Profits. *The Risk Desk* **2**, No. 3, May 2002.

SCIENTIFIC DATASETS WITH DIGITAL IDENTIFIERS

- Keaveney, C. W., Lackmann, G. M., & Dowling, T. E. (2024). Archive: Effect of transient vortex interactions on the size and strength of Jupiter's Great Red Spot. In Icarus. Zenodo. <https://doi.org/10.5281/zenodo.12374539>
- Michaelis, Allison; Turnau, Roger; Lackmann, Gary; Robinson, Walter (2022), High-resolution climate simulations using the Model for Prediction Across Scales - Atmosphere (MPAS-A; version 5.1), Dryad, Dataset, <https://doi.org/10.5061/dryad.8cz8w9gtp>.
- Jung, Chunyong; Lackmann, Gary (2023), High-resolution quasi-idealized experiments for future and present-day based upon composites from a decades-long set of recurving landfalling (RCL) North Atlantic ET cases, Dryad, Dataset, <https://doi.org/10.5061/dryad.7sqv9s4x5>

GRANT PROPOSALS

[48 funded; > \$10M; 16 declined; 0 pending]

EDITORIAL BOARDS AND PROFESSIONAL COMMITTEES

Editor-in-Chief, *Weather and Forecasting* (August 2017 to 2023)
 Subject Area Editor: *Bulletin of the AMS* (2006 to 2013)
 Associate Editor: *Monthly Weather Review* (January 1999 to 2004)
 Reviewer, National Science Foundation (NSF)
 Reviewer, U.S. Department of Energy (DOE)
 Reviewer, U.S. National Oceanographic and Atmospheric Administration (NOAA)
 Reviewer, U.S. National Atmospheric and Space Administration (NASA)
 Reviewer, *Bulletin of the AMS*
 Reviewer, *Journal of the Atmospheric Sciences*
 Reviewer, *Nature*
 Reviewer, *Nature, Climate Change*
 Reviewer, *Weather and Forecasting*
 Reviewer, *Journal of Applied Meteorology*
 Reviewer, *Proceedings of the National Academy of Sciences (PNAS)*
 Reviewer, *Quarterly Journal of the Royal Meteorological Society* (United Kingdom)

Reviewer, *Atmosphere–Ocean* (Canada)
 Reviewer, *Tellus* (Sweden)
 Reviewer, *Monthly Weather Review*
 Reviewer, *Meteorology and Atmospheric Physics* (Europe)
 Reviewer, *Journal of Hydrometeorology*
 Reviewer, *International Journal of Climatology* (United Kingdom)
 Reviewer, *Journal of Climate*
 Reviewer, *Climate Dynamics*
 Reviewer, *Journal of Applied Meteorology and Climatology*
 Reviewer, *Meteorology and Atmospheric Sciences*
 Reviewer, *Atmospheric Research*
 Reviewer, *Journal of Geophysical Research*
 Reviewer, *Central European Journal of Geosciences*
 Reviewer, *Proceedings A, Royal Society* (Physics, United Kingdom)
 Reviewer, *Atmospheric Chemistry and Physics*
 Reviewer, *Geophysical Research Letters*
 Reviewer, *Atmospheric Science Letters*
 Reviewer, *Public Library of Science (PLOS ONE)*
 Reviewer, *Natural Hazards*
 Reviewer, *Weather and Climate Dynamics* (Europe)

Councilor (elected), American Meteorological Society (2018 to 2020)
 Member, AMS Committee on Ethics (2020 to present)
 Member, AMS Board of Continuing Professional Development, (2013 to 2018)
 Co-Chair, UCAR UCACN NOAA National Centers Advisory Committee (2015 to 2018)
 Member, UCAR UCACN NOAA National Centers Advisory Committee (2009 to 2015)
 Member, UCAR Development Testbed Center Science Advisory Board (2013 to 2016)
 Member: AMS Committee on Weather Analysis and Forecasting, (2001 to 2004).
 Member: AMS Committee on Broadcast Meteorologist Certification, (2003 to 2005)
 Member: AMS Central Carolina Chapter
 Member: National Weather Association
 Chair, Unidata Users Committee (2006 to 2009)
 Member, Unidata Users Committee (2004 to 2006)
 Member, Unidata Policy Committee (2006 to 2012)
 Member: Sigma Xi
 Member, Oklahoma University WxChallenge advisory board (2010 to 2023)
 Program Review, Millersville University (Fall 2012)
 Program Review, NC State Biological and Agricultural Engineering (Spring 2015)

NORTH CAROLINA STATE UNIVERSITY SERVICE

Departmental Educational Technology Fee Committee (current until DH appointment)
 Departmental Diversity Committee (current until DH appointment)
 Departmental Teaching Evaluation Committee (current until DH appointment)
 College of Sciences Professors of Distinction Committee (current until DH appointment)
 NC State University Promotion and Tenure Committee (2018–2019)
 College of Sciences Promotion and Tenure Committee (2017–2019; chair 2017, member 2018)
 Departmental Director of Graduate Programs (2011–2016)
 Graduate Faculty Member (1999–present)
 University Grievance Committee (past)
 Faculty Advisor: NCSU AMS Student Chapter, (2000–2019)
 Faculty Advisor: NCSU MEAS Graduate Student Association, (2010–2015)
 Faculty Advisor: NCSU MEAS Research Forecasting & Discussion club, (2015–2021)
 Building Future Faculty Advisory Committee, 2015
 Graduate Faculty Mentoring Award Selection Committee, 2015
 HHMI Faculty Mentor, 2002
 Park Program Faculty Mentor, 2001–2003, 2010–2012

Preparing the Professoriate Faculty mentor, 2006–2007, 2011–2012
 Physical and Mathematical Sciences Open House Volunteer
 Departmental Undergraduate Curriculum Committee (past)
 Departmental Computing Committee (past)
 Departmental Awards Committee (past)
 Departmental Space Committee (past)
 Departmental Info and Brochure Committee (past)
 Departmental WWW Committee (past)
 Chair, 3 Departmental search committees
 Member, 6 Departmental search committees

INVITED PRESENTATIONS (SELECTED, LAST ~15 YEARS)

- “*NASEM Probable Maximum Precipitation Study: Past, Present & Future Extremes*”, Invitation to public panel of National Academies study, 10 April 2023.
- “*Amplification of Chinook Heatwaves in a warming climate*”, Department of Atmospheric and Oceanic Sciences, McGill University, Montreal, Quebec, Canada. Monday 27 March 2023 (in person)
- “*Future Weather Extremes*”, Keenan Institute Climate Leaders Symposium, 10 October 2022.
- “*Meteorological Modeling of Jupiter’s Great Red Spot*”, North Carolina State University Coffee and Viz seminar series. 16 September 2022.
- “*Inland Impacts of Weakening Tropical Cyclones*”. Gary M. Lackmann, with M. Bell and K. Hollinger. Upstate South Carolina AMS, 21 June 2022.
- “*Extratropical Persistent Anomalies: Trends & Responses to Environmental Change*”. Stony Brook University School of Marine and Atmospheric Sciences. 6 April 2022.
- “*Potential Vorticity and Atmospheric River Predictability*”, Center for Western Weather and Water Extremes (CW3E), Scripps Institution of Oceanography, UC San Diego, 23 April 2021.
- “*Extreme Weather and Climate Change*”, United Nations Association, Wake County Chapter, 20 May 2021.
- “*Detecting (and Predicting) Extratropical Persistent Anomalies*”, Commodity Weather Group, Educational Webinar Series, 10 August 2021.
- “*The Extratropical Transition of Tropical Cyclones in a Warming Climate*”. Seoul National University, South Korea, 21 October 2020.
- “*Extratropical Persistent Anomalies: Current Trends and Future Projections*”. National Center for Atmospheric Research, Boulder, CO, 23 April 2020. Link to talk [here](#).
- “*Winter Weather NWP: Interpretations, Diagnostics, and HRRR Verification for Mesoscale Snowbands*”, National Weather Service, Weather Prediction Center Winter Weather Experiment, 14 February 2020.
- “*The Extratropical Transition of Tropical Cyclones in a Changing Climate*”. Central Carolina Chapter, American Meteorological Society, 23 January 2020.
- “*The Extratropical Transition of Tropical Cyclones in a Changing Climate*”. University of North Carolina, Chapel Hill, Department of Marine Sciences, 6 November 2019.
- “*Low-Level Jets, Potential Vorticity, and Atmospheric Rivers*”. CW3E/UCSD/Scripps Institution of Oceanography. 19 June 2019.
- “*Extratropical Transition of Tropical Cyclones in a Changing Climate*”. National Center for Atmospheric Research (NCAR) Distinguished Lecturer Series, 14 March 2019
- “*Snow Lofting in Mesoscale Bands, and Operational Utility in Non-Traditional NWP Output Fields*”. Weather Prediction Center Residence Series, 15 March 2019
- “*Expanding NWP Output for Analysis and Forecasting of Winter Storms*” Northern Plains Weather Workshop, 5 November 2018, Keynote speaker.

- "Science Café: A Better Way to Think About Forecasts?"*, with Greg Fishel (WRAL TV), NC Museum of Natural Sciences, 8/30/2018 <https://www.facebook.com/naturalsciences/videos/greg-fishel-of-wral-and-gary-lackmann-professor-of-meteorology-at-nc-state-are-h/1036911763179687/>
- "Challenges in the Numerical Simulation of Tropical Cyclones"*, NC State Department of Nuclear Engineering, CASL Summer Institute, 13 August 2018, Keynote dinner speaker.
- "Why is the numerical modeling of tropical cyclones so challenging?"* NC State Research Computing Series, 14 March 2018, DH Hill Library
- "Water vapor phase changes and the mesoscale dynamics of heavy precipitation."* American Meteorological Society Annual Meeting, Austin, Texas, January 2018. Special Session: The Role of Water in Shaping Features of the Climate System
- "The role of water in mesoscale atmospheric dynamics"* Southeastern Coastal and Atmospheric Processes Symposium (SeCAPS), Mobile, Alabama. 17 February 2018. Keynote talk
- "Hurricane Joaquin's role in the South Carolina Flood of October 2015"* National Weather Center Colloquium, 17 October 2017: (Norman, Oklahoma)
- "Winter Weather NWP, and Automated Detection of Mesoscale Snowbands"*. (Lackmann and Radford), Webinar to National Weather Service offices, 13 December 2017
- "Desktop Clouds"*. College of Sciences, State of the Sciences event, NC State Hunt Library, 4/21/2017.
- "Science Café: Critical Thinking"*, with Greg Fishel, NC Museum of Natural Sciences, 4/20/2017 <http://naturalsciences.org/calendar/event/science-cafe-critical-thinking/>
- "The South Carolina Flood of October, 2015."* AMS Annual Meeting, 16th Annual Student Conference. Seattle, Washington. Saturday 21 January 2017.
- "Climate Modeling Challenges for Tropical Cyclones"*. GEWEX Convection Permitting Climate Modeling Workshop, 8 September 2016.
- "Hurricane Joaquin and the South Carolina Flood of October 2015"*. National Center for Atmospheric Research, Boulder, CO, 27 June 2016.
- "Hurricane Joaquin's Role in the South Carolina Flood of October 2015"*. Palmetto Chapter of the AMS, Allen Weber Mini-Tech conference, 4 March 2016. Keynote.
- "Collaboration, Visualization, and Communication Within and Beyond the Geosciences"*. Keynote presentation, AMS Summer Meeting, 4 August 2015.
- "Hurricane Katrina: Before, During, and Ten Years After"*. Invited presentation, NC State University, Coffee and Viz series, 20 March 2015.
- "Mathematics and Weather Forecasting"*. Invited presentation, North Carolina School of Science and Math, Delivered via Google owing to ice event, 6 March 2015.
- "Student Research, Climate Change, and Extreme Weather"*. Invited presentation, Raleigh Charter High School, Science Methods class, Raleigh, NC, 13 February 2015.
- "Climate Change and Hurricane Sandy"*. Invited presentation, University of Connecticut, Department of Civil & Environmental Engineering, Storrs, CT, 30 January 2015.
- "Balancing Change with Tradition in the Synoptic Lab"*. Invited presentation, 24th Symposium on Education, 95th AMS Annual Meeting, Phoenix, AZ, January 2015.
- "Some Conference 'Best Practices' for Student Attendees (and a few 'worst practices)"*. Invited presentation, 14th Annual Student Conference, 95th AMS Annual Meeting, Phoenix, AZ, January 2015.
- "Climate Change and Hurricane Sandy"*. Invited presentation, National Center for Atmospheric Research, Developmental Testbed Center, Boulder, CO, 11 August 2014. http://www.dtcenter.org/events/seminar/g_lackmann.mp4
- "Research at the Weather-Climate Interface"*. Invited presentation, EPA Climate Modeling Consortium Workshop, Chapel Hill, NC, 12 May 2014.
- "Weather Extremes and Climate Change"*. University at Albany Departmental Seminar, Albany, NY 17

January 2014.

“*Extreme weather and climate change*”. Departmental colloquium, University of Wisconsin, Madison, 21 October 2013.

“*Climate change: Mesoscale and synoptic-scale precipitation events*”. CLIVAR workshop on Large-Scale Meteorological Processes, University of California, Berkeley, 21 August 2013 (remote)

“*Weather Extremes and Climate Change*”. Central North Carolina Chapter, American Meteorological Society, 21 March 2013

“*Hurricanes: Short-term prediction, and response to climate change*”. ENCORE class, McKimmon Center, NCSU, 4 October 2012.

“*Tropical cyclones, low-level jets, and thermodynamic climate change*”. Canadian Meteorological and Oceanographic Society (CMOS), 2012 Congress joint with AMS Weather Analysis and Forecasting/Numerical Weather Prediction, Plenary presentation, 30 May 2012, Montreal, Quebec, Canada.

“*Weather and educational inspiration: Getting weather into the classroom*”. Lance Bosart Symposium, University at Albany, April 2012, Albany, NY.

“*Cyclones and climate change*”. Southeastern Coastal and Atmospheric Processes Symposium (SeCAPS), University of South Alabama. Keynote presentation, 24 March 2012, Mobile, AL.

“*Environmental influences on tropical cyclones*”. 50th Anniversary Celebration of Atmospheric Sciences at the University at Albany, 4 October 2010, Albany, New York.

“*The structure of cyclonic systems in changing thermodynamic environments*”. 50th Anniversary Scientific Program, Department of Atmospheric and Oceanic Sciences, McGill University, 24 September 2010, Montreal, Quebec, Canada.

“*Replicating the Atlantic Hurricane Season of 2005, Ninety Years in the Future*”. University of Hawaii, School of Ocean and Earth Science and Technology, 24 February 2010.

“*The Unidata Difference: Within and Outside the Classroom*”. Unidata 25th Anniversary Symposium, 15 October 2009, Boulder, CO.

“*Meteorology, Storms, and Weather*”. Presentation at Apex Middle School, 2 October 2009 [7th grade (~300 students)].

“*Will Global Warming Bring Us More Powerful Hurricanes?*” Sunday Lecture Series, North Carolina State University, 27 September 2009.

MEDIA APPEARANCES AND INTERVIEWS

(Selected recent, incomplete)

WRAL TV, Raleigh, NC: [Hurricane Ian and climate change](#); Aired 30 September 2022

WBTV TV, Charlotte, NC: 28 September 2022 (live interview); Hurricane Ian

[AXIOS Raleigh](#), 27 July 2022 on increased extreme rain events due to climate warming.

Associated Press, 1 July 2022, interview concerning recent Yellowstone National Park flooding, weather prediction, and climate change.

Raleigh News and Observer, 13 December 2021, interview concerning Kentucky tornado outbreak. (Josh Shaffer)

Audubon Magazine, 9 September 2021: Interview about climate change, storms, and seabirds of the North Atlantic. (Lauren Leffler)

New York Times, 23 August 2021: Interview about climate change and Tennessee flooding event. (Winston Choi-Schagrin) – article featured on front page of NYT

CBS 17 News: Story on NC transportation infrastructure and flooding. April 20 2021 (Laura Smith)

(<https://www.cbs17.com/news/local-news/nc-state-hurricane-experts-studying-how-future-storms-will->

[impact-nc-roads-infrastructure/](#))

Washington Post, 9 January 2021, regarding AMS DEI initiatives:

(<https://www.washingtonpost.com/weather/2021/01/09/women-minorities-harassment-weather-climate/>)

Washington Post, 2 April 2020, regarding Earth Prediction Innovation Center:

(<https://www.washingtonpost.com/weather/2020/04/02/noaa-epic-rfp/>)

Spectrum News, 20 January 2020: The 20th anniversary of the NC snowstorm

CNN New Day, 12 September 2018: On Hurricane Florence

Chesterfield Observer, VA, 2018: Hurricane Florence

Richmond Times-Dispatch, 2018: Hurricane Florence

NPR State of Things, September 2018: Hurricane Florence

NBC Universal: <https://www.nbcnews.com/mach/video/tracking-florence-as-it-makes-landfall-1320039491878>

WRAL-TV, Raleigh, Joaquin, 6 October 2015

Charlotte News and Observer, Hurricane prediction, September 2015

WUNC-TV, Lightning, 16 September 2015

Arise News, regarding Hurricane Arthur, 2 July 2014

News and Observer (Raleigh and Charlotte) May 2014

NBC17, Raleigh, European vs. US Forecast Models, May 2013

Virginian-Pilot Newspaper, Norfolk, VA, 3 January 2013

PBS/NOVA, Interview regarding Hurricane Sandy, 7 March 2013, 20 August 2013

WRAL-TV, Raleigh, Hurricane Sandy, 11 November 2012

NBC17, Raleigh, Hurricane Sandy, October 2012

WRAL-TV, Raleigh, Greg Fishel 30-year Congratulations, 18 May 2011

National Public Radio WUNC, The State of Things, 28 April 2011

http://wunc.org/tsot/archive/Hurricane_Prediction.mp3/view

POST-DOCTORAL SCHOLARS SUPERVISED

2018-20 Greg Tierney (U. Michigan, co-supervised with Walt Robinson)

2010-13 Juhui (Jessie) Ma (AirDat/ Panasonic)

GRADUATE THESES SUPERVISED

Student (last known employment or first employment following graduation)

Ph.D. Dissertations Supervised/Chair (8)

Michael Brennan (NOAA National Hurricane Center, now Director)

Kevin Hill (A.I.R. Inc., Boston, MA, now Berkshire Hathaway)

Neil Jacobs (co-advised with Sethu Raman; AirDat, Inc, Panasonic, NOAA Deputy Dir., EPIC)

Chunyong Jung (University of Illinois, Urbana-Champaign, now Argonne National Laboratory)

Kelly Mahoney (NOAA/Earth Systems Research Laboratory)

Megan Mallard (formerly Gentry; US Environmental Protection Agency)

Allison Michaelis (UC San Diego/Scripps/CW3E, now Northern Illinois University)

Jacob Radford (CSU/CIRA)

Master of Science Theses Supervised/Chair (28)

Chris Bailey (NOAA Hydrometeorological Prediction Center)
 Adam Baker (NOAA/NWS, Indianapolis, IN)
 Lindsay Blank (Developmental Testbed Center, NCAR, Boulder, CO)
 Matt Borkowski (Meso, Inc. Albany NY)
 Michael Brennan (Continued for PhD)
 Jason Caldwell (NOAA/NWS Lower Mississippi RFC)
 Trevor Campbell (Mott McDonald)
 Jason Cerjak (U.S. Air Force)
 Jordan Dale (Energetics, Washington DC)
 Nathanael Farrington (US Air Force)
 Tiffany Gardner (Trinity Consulting, Dallas, TX)
 Megan Gentry (Continued for PhD, now Mallard)
 Briana Gordon (Sonoma Technology, San Francisco, CA)
 Chase Graham (NWS – Louisville, KY)
 Nicole Haglund (Oklahoma Climate Survey, now Guiliano)
 Kevin Hill (Continued for PhD)
 Blair Holloway, M.S. (NWS, Greer, SC)
 Kelly Mahoney (Continued for PhD)
 Chris Marciano (ARA, Washington, DC)
 Allison Michaelis (Continued for PhD)
 Rebecca Miller (US EPA via ORAU)
 Jacob Radford (Continued for PhD)
 Heather Reeves (Continued for PhD, NOAA National Severe Storms Lab)
 Wendy Sellers (NWS, Charleston SC)
 Morgan Silverman (NASA Langley)
 Jennifer Tate (NOAA Weather Prediction Center, College Park, MD)
 Ana Torres-Vazquez (US EPA via ORAU)
 Richard Yablonsky (University of Rhode Island, now A.I.R.)

Non-Thesis M.S. Graduate Advisees (5)

Michael Graves (Arizona Department of Environmental Quality)
 Eric Santilli (May 2013)
 Bradley McLamb (NC DENR)
 Whitney Rushing (NOAA/NWS, Columbia, SC)
 Yaosheng Chen (Penn State University)

EXTERNAL GRADUATE COMMITTEES

School of Marine and Atmospheric Sciences, Stony Brook University
School of Engineering, Duke University
Department of Marine Science, UNC Chapel Hill

TEACHING EXPERIENCE

	Dept. of Marine, Earth, & Atmospheric Sciences, North Carolina State University
1999	Introduction to Atmospheric Science I (MEA 213)
1999-09	Introduction to Atmospheric Science II (MEA 214, 10 times)
2000-22	Synoptic Weather Analysis and Forecasting (MEA443, 22 times)
2001-23	Applied Numerical Weather Prediction (MEA 716, 11 times)
2002-22	Advanced Weather Analysis (Synoptic-Dynamic Meteorology) (MEA 717, 10 times)
2015	MEAS third-year seminar (MEA495, co-instructor)
2018	Atmospheric dynamics II (MEA422)
2016-18	First-year Graduate Seminar (MEA 611, 612, 613, coordinator)

Dept. of Earth Science, SUNY College at Brockport

1996-99 Physical Meteorology (ESC 416)
 1996-99 Atmospheric Thermodynamics
 1996-99 Boundary Layer Meteorology
 1996-99 Introduction to Meteorology
 1996-99 Instrumentation
 1996-99 Synoptic Meteorology
 1996-99 Weather Forecasting

FIELD PROJECTS

Integrated Precipitation and Hydrology Experiment (IPHEX), 2014.

Stormscale Operational and Research Meteorology-Fronts Experiment Systems Test (STORM-FEST) 1992.

Coordinated Eastern Arctic Experiment (CEAREX) 1988–1989

List of Acronyms

AMS American Meteorological Society
 COMET Cooperative Program for Operational Meteorology, Education and Training
 COS College of Sciences
 CSTAR Collaborative Science, Technology, and Applied Research
 MEAS Department of Marine, Earth, and Atmospheric Sciences
 NAS National Academy of Sciences
 NCAR National Center for Atmospheric Research
 NCSU North Carolina State University
 NOAA National Oceanographic and Atmospheric Administration
 NRC National Research Council
 NSF National Science Foundation
 NWA National Weather Association
 NWS National Weather Service
 PAMS College of Physical and Mathematical Sciences (became College of Sciences)
 PI principal investigator