Michael S. Fischer

Curriculum Vitae

University of Miami
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Education:

Ph.D., Atmospheric Science 2018
University at Albany - State University of New York, Albany, NY
Thesis: *Tropical Cyclone Rapid Intensification in Environments of Upper- Tropospheric Troughs: Environmental Influences and Convective Characteristics*
Advisors: Drs. Brian Tang and Kristen Corbosiero

B.S., Geosciences (Atmospheric Science Track) – Magna Cum Laude 2013
Florida International University, Miami, FL

Research Experience:

Assistant Professor 2024–Present
University of Miami, Miami, FL

Associate Scientist 2023–2024
University of Miami/CIMAS, Miami, FL

Assistant Scientist 2020–2023
University of Miami/CIMAS, Miami, FL

National Research Council Postdoctoral Research Associate 2018–2020
NOAA AOML Hurricane Research Division, Miami, FL

Scientific Programmer 2018
Innovim/National Hurricane Center, Miami, FL

Teaching Experience:

Assistant Professor 2025–Present
University of Miami, Miami, FL
- RSM 780: Directed Readings in Tropical Weather and Climate
- ATM 102: Introduction to Weather and Climate

Guest Lecturer 2021–2025
University of Miami, Miami, FL
- Undergraduate courses: Meteorological Instrumentation and Observation
- Graduate courses: Introduction to Atmospheric Physics; Hurricanes

St. Cloud State University, St. Cloud, MN
- Undergraduate courses: Weather Discussion I

Teaching Assistant 2013–2016
University at Albany - State University of New York, Albany, NY

- Undergraduate courses: Dynamic Meteorology I, Dynamic Meteorology II, Tropical Meteorology, Natural Disasters, Understanding the Earth

Honors and Awards:

Journal of the Atmospheric Sciences Editor's Award	2024
Quarterly Journal Prize Reviewer's Certificate	2020
University at Albany's Distinguished Dissertation Award	2019
Narayan R. Gokhale Distinguished Research Scholarship Award	2018
Outstanding Student Oral Presentation Award, *33rd Conference on Hurricanes and Tropical Meteorology*	2018
Top graduate student forecaster for Green Bay, WI in national WxChallenge competition	2015

Mentoring:

Graduate Students

Kelly Neighbour
- Ph.D. student, University of Miami, 2025–Present.

Helena Tsigos
- Ph.D. student, University of Miami, 2025–Present.

Cameron Pine
- Ph.D. student, University of Miami, 2023–Present. Co-mentor with Drs. David Nolan and George Alvey

Shannon McCloskey
- M.P.S. student, University of Miami, 2024–Present.

Luis Hernandez
- NERTO intern, Ph.D. student at the University at Albany, 2024. Co-mentor with Dr. Ghassan Alaka

Amanda Keane
- M.P.S., University of Miami, 2022. Thesis: *Using NOAA Tail Doppler Radar Observations to Examine the Evolution of Vortex Tilt in Rapidly Intensifying Hurricane Ida (2021)*

Refereed Publications:

Nolan, D. S., M. S. Fischer, and M. E O'Neill, 2025: Reconsideration of the mass and condensate sources for the tropical cyclone outflow. *Bull. Amer. Meteor. Soc.*, **106**, E1342–E1359.

Fischer, M. S., P. D. Reasor, J. P. Dunion, and R. F. Rogers, 2025: Are rapidly intensifying tropical cyclones associated with unique vortex and convective characteristics? *Mon. Wea. Rev.*, **153**, 183–203.

Rios-Berrios, R., P. M. Finocchio, J. J. Alland, X. Chen, M. S. Fischer, S. Stevenson, and D. Tao, 2024: A review of the effects of vertical wind shear on tropical cyclone structure and intensity. *J. Atmos. Sci.*, **81**, 713–741.

Shimada, U., P. Reasor, R. Rogers, Fischer, M. S., F. Marks, J. Zawislak, and J. Zhang, 2024: Shear-relative asymmetric kinematic characteristics of intensifying hurricanes as observed by airborne Doppler radar. *Mon. Wea. Rev.*, **152**, 491–512.

Fischer, M. S., R. F. Rogers, P. D. Reasor, and J. P. Dunion, 2024: An observational analysis of the relationship

between tropical cyclone vortex tilt, precipitation structure, and intensity change. *Mon. Wea. Rev*., **152**, 203–225.

Wadler, J. B., J. J. Cione, R. F. Rogers, and M. S. Fischer, 2023: On the distribution of convective and stratiform precipitation in tropical cyclones from airborne Doppler radar and its relationship to intensity change and environmental wind shear direction. *Mon. Wea. Rev.*, **151**, 3209–3233.

Wadler, J. B., J. E. Rudzin, B. J. de la Cruz, J. Chen, M. S. Fischer, G. Chen, N. Qin, B. Tang, and Q. Li, 2023: A review of recent research progress on the external influences of tropical cyclone intensity change. *Tropical Cyclone Res. and Rev.*, https://doi.org/10.1016/j.tcrr.2023.09.001.

DesRosiers, A. J., M. M. Bell, P. J. Klotzbach, M. S. Fischer, and P. Reasor, 2023: Observed relationships between tropical cyclone vortex height, intensity, and intensification rate. *Geophys. Res. Lett.*, **50**, e2022GL101877.

Stone, Z., G. R. Alvey III, J. P. Dunion, Fischer, M. S., D. J. Raymond, R. F. Rogers, S. Sentic, and J. Zawislak, 2023: Thermodynamic contribution to vortex alignment and rapid intensification of Hurricane Sally (2020). *Mon. Wea. Rev*., **151**, 931–951.

Fischer, M. S., P. D. Reasor, B. H. Tang, K. L. Corbosiero, R. D. Torn, and X. Chen, 2023: A tale of two vortex evolutions: Using a high-resolution ensemble to assess the impacts of ventilation on a tropical cyclone rapid intensification event. *Mon. Wea. Rev*., **151**, 297–320.

Hazelton, A., G. J. Alaka, M. S. Fischer, R. D. Torn, and S. Gopalakrishnan, 2023: Factors influencing the track of Hurricane Dorian (2019) in the West Atlantic: Analysis of a HAFS ensemble. *Mon. Wea. Rev.*, **151**, 175–192.

Fischer, M. S., P. D., Reasor, R. F. Rogers, and J. F. Gamache, 2022: An analysis of tropical cyclone vortex and convective characteristics in relation to storm intensity using a novel airborne Doppler radar database. *Mon. Wea. Rev*., **150**, 2255–2278.

Alvey, G., M. S. Fischer, P. Reasor, J. Zawislak, and R. Rogers, 2022: Processes underlying the vortex repositioning during Dorian's (2019) Early Stages that increased its favorability for rapid intensification. *Mon. Wea. Rev*., **150**, 193–213.

Zawislak, J., R. Rogers, S. Aberson, G. Alaka, G. Alvey, A. Aksoy, L. Bucci, J. Cione, N. Dorst, J. Dunion, M. S. Fischer, J. Gamache, S. Gopalakrishnan, A. Hazelton, H. Holbach, J. Kaplan, H. Leighton, F. Marks, S. Murillo, P. Reasor, K. Ryan, K. Sellwood, J. Sippel, and J. Zhang, 2022: Accomplishments of NOAA's Airborne Hurricane Field Program and a broader future approach to forecast improvement. *Bull. Amer. Meteor. Soc*., **102**, 1–79.

Hazelton, A., G. J. Alaka, L. Cowan, M. S. Fischer, S. Gopalakrishnan, 2021: Understanding the processes causing the early intensification of Hurricane Dorian through an ensemble of the Hurricane Analysis and Forecast Systems (HAFS). *Atmos.*, **12**, 93.

Fischer, M. S., R. F. Rogers, and P. D. Reasor, 2020: The rapid intensification and eyewall replacement cycles of Hurricane Irma (2017). *Mon. Wea. Rev*., **148**, 981–1004.

Fischer, M. S., B. H. Tang, and K. L. Corbosiero, 2019: A climatological analysis of tropical cyclone rapid intensification in environments of upper-tropospheric troughs. *Mon. Wea. Rev*., **147**, 3693–3719.

Fischer, M. S., B. H. Tang, K. L. Corbosiero, and C. M. Rozoff, 2018: Normalized convective characteristics of tropical cyclone rapid intensification events in the North Atlantic and eastern North Pacific basins. *Mon. Wea. Rev*., **146**, 1133–1155.

Fischer, M. S., B. H. Tang, and K. L. Corbosiero, 2017: Assessing the influence of upper-tropospheric troughs on tropical cyclone intensification rates after genesis. *Mon. Wea. Rev*., **145**, 1295–1313.

Publications in Review/Preparation:

Fischer, M. S., G. R. Alvey III, D. Jariwala, and P. D. Reasor, 2026: To align or not to align? That is the question. *J. Geophys. Res. Atmos.*, in review.

Alvey III, G. R., J. Zhang, J. Dunion, B. Dahl, and M. S. Fischer, 2026: The Path to Alignment: Dual-Doppler and SAMURAI Observations of Tropical Cyclone Fiona (2022). *Mon. Wea. Rev.*, in prep.

Fischer, M. S., W. Bouza, D. Jariwala, and M. Reardon 2026: Estimating Tropical Cyclone Vortex Tilt from Geostationary Satellite Imagery using a Random Forest. *Wea. Forecasting*, in prep.

Book/Encyclopedia Chapters:

Sippel, J. A., and M. S. Fischer, 2026: Tropical cyclone intensity predictability. Reference Module in Earth Systems and Environmental Sciences, *Encyclopedia of Atmospheric Sciences*, Third Edition, Vol. 1, 446–459, https://doi.org/10.1016/B978-0-323-96026-7.00140-5.

Grant Funding:

Collaborative Research: Tropical Cyclones from 400 to 40 hPa. National Science Foundation, 2/2024–1/2027, $777,109. (Co-PI with Drs. David Nolan and Morgan O'Neill)

Application of Machine Learning Techniques to the Automated Quality Control of Airborne Doppler Radar Data Used in Operational Analysis of Hurricane Winds and Reflectivity. NOAA-OAR-WPO-2023-2007516, 8/2023–7/2025, $400,686. (PI with Co-PI Dr. Michael Bell)

A comprehensive observational examination of the physical processes that link tropical cyclone vortex alignment to future intensity change. National Science Foundation, 4/2023–3/2026, $539,622. (Co-PI with Drs. George Alvey and David Nolan)

Synergistic Activities:

TC-RADAR Developer 2019–Present

- Developer of a novel airborne Doppler radar database, Tropical Cyclone Radar Archive of Doppler Analyses with Recentering (TC-RADAR), which contains over 1,500 radar analyses from storms sampled by NOAA's WP-3D aircraft.

Hurricane Research Division Field Program Science Team Member 2018–Present

- PI of the Vortex Alignment Module

Rapid Intensification in Tropical Cyclones (TCRI) Science Team Member 2020–2024

Hurricane and Ocean Testbed Collaborator 2021–Present

Select Presentations (* indicates invited presentation):

*Fischer, M. S.: A machine learning approach to estimate the three-dimensional tropical cyclone kinetic structure. 2026 NSF IPAM Mathematics and Machine Learning for Earth System Simulation, Los Angeles, CA, February 2026.

*Fischer, M. S.: A machine learning approach to estimate the three-dimensional tropical cyclone wind field. 2025 American Geophysical Union Annual Meeting, New Orleans, LA, December 2025.

*Fischer, M. S.: Exploring tropical cyclone structural precursors to rapid intensification. 2025 Symposium for Tropical Cyclone Risk in a Changing Climate, Clearwater, FL, June 2025.

Fischer, M. S.: A machine learning approach to estimate tropical cyclone structure using geostationary satellite observations. Working Group on Tropical Meteorology Research (WGTMR) Annual Meeting, Virtual, May 2025.

Fischer, M. S.: Using machine learning to better understand tropical cyclone structure and intensity change. Seminar for University of Miami's Frost Institute for Data Science and Computing, Miami, FL, April 2025.

*Fischer, M. S.: Data-driven insights into tropical cyclone rapid intensification. Seminar for the University of Alabama in Huntsville, Huntsville, AL, March 2025.

Fischer, M. S., P. D. Reasor, J. P. Dunion, and R. F. Rogers: Are rapidly intensifying tropical cyclones associated with unique vortex characteristics? American Meteorological Society's 36th Conference on Hurricanes and Tropical Meteorology, Long Beach, CA, May 2024.

Fischer, M. S., R. F. Rogers, P. D. Reasor, and J. P. Dunion: The relationship between tropical cyclone vortex tilt, precipitation structure, and intensity change. American Meteorological Society's 100th Annual Meeting, Baltimore, MD, January 2024.

Fischer, M. S., P. D. Reasor, R. F. Rogers, and J. P. Dunion, B. H. Tang, K. L. Corbosiero, R. D. Torn, and X. Chen: Exploring the relationship between vortex misalignment and tropical cyclone intensity change. Hurricane Forecast Improvement Project seminar, April 2023.

Fischer, M. S., P. D. Reasor, R. F. Rogers, and J. F. Gamache: An analysis of tropical cyclone vortex and convective characteristics in relation to storm intensity using a novel airborne Doppler radar database. 35th Conference on Hurricanes and Tropical Meteorology, New Orleans, LA, May 2022.

Fischer, M. S., R. F. Rogers, P. D. Reasor, and J. P. Dunion: Relationships between vortex tilt, convective structure, and intensity change in early-stage tropical cyclones. 34th Conference on Hurricanes and Tropical Meteorology, May 2021.

Fischer, M. S., R. F. Rogers, P. D. Reasor, and J. P. Dunion How is tropical cyclone vortex tilt related to precipitation structure and intensity change? 14th International Conference on Mesoscale Convective Systems and High-Impact Weather in East Asia, April 2021.

Fischer, M. S., R. F. Rogers, and P. D. Reasor: An examination of local shear, vortex tilt, and tropical cyclone intensity change using airborne radar observations. American Meteorological Society's 100th Annual Meeting, Boston, MA, January 2020.

Fischer, M. S., R. F. Rogers, and P. D. Reasor: The rapid intensification and eyewall replacement cycles of Hurricane Irma (2017). 19th Cyclone Workshop, Seeon, Germany, October 2019.

Fischer, M. S., B. H. Tang, and K. L. Corbosiero: Characteristics of tropical cyclone rapid intensification in environments of upper-tropospheric troughs. 33rd Conference on Hurricanes and Tropical Meteorology, Ponte Vedre Beach, FL, April 2018.

Fischer, M. S., B. H. Tang, and K. L. Corbosiero: Convective characteristics of tropical cyclone rapid intensification in environments of upper-tropospheric troughs. 8th Northeast Tropical Meteorology Workshop, Rensselearville, NY, June 2017.

Fischer, M. S., B. H. Tang, and K. L. Corbosiero: The influence of an upper-tropospheric potential vorticity anomaly on rapid tropical cyclogenesis. 32nd Conference on Hurricanes and Tropical Meteorology, San Juan, Puerto Rico, April 2016.

Professional Service:

- Associate Editor for *Monthly Weather Review* (2020–Present)
- Reviewer for *Journal of the Atmospheric Sciences, Monthly Weather Review, Journal of Applied Meteorology and Climate, Quarterly Journal of the Royal Meteorological Society, Atmosphere, Journal of*

Geophysical Research – Atmospheres, Geophysical Research Letters, Dynamics of Atmospheres and Oceans, NPJ Climate and Atmospheric Science, Weather and Climate Dynamics (2017–Present)

- Proposal reviewer for the National Science Foundation (2023–Present)
- Session chair for *Tropical Cyclone Rapid Intensification* at the *35th Conference on Hurricanes and Tropical Meteorology* (2022)
- Working group member for *10th International Workshop on Tropical Cyclones* (2022)
- Max Eaton Award committee member at the *34th and 35th Conference on Hurricanes and Tropical Meteorology* (2021, 2022)
- Student poster award committee member at the *34th Conference on Hurricanes and Tropical Meteorology* (2022)
- Session co-chair for *Rapid Intensification of Tropical Cyclones* at the 101st American Meteorological Society Annual Meeting (2021)