

Jackson Wiles

M.S. & Ph.D. Candidate

ATMOSPHERIC SCIENTIST

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EXPERIENCE

Research Associate *NC A&T State University*

Community Research on Climate and Urban Science (CROCUS) funded by the Department of Energy under contract # DE-SC0023240

Summer 2025-Present

- Conducting WRF-ARW simulations of the July 15th, 2024, derecho and its effects on the Urban Heat Island of Chicago, Illinois

Improve the Prediction of TC Track and Intensity by Machine Learning Based Ensemble Techniques funded by the Office of Naval Research

Summer 2024-Fall 2025

- Collected and processed datasets (HURDAT2, ERA5 Reanalysis, ERA5 10-member Ensemble, and GDAS Data) for ML applications
- Applied statistical and machine learning techniques to prepare and format data through Convolutional Neural Networks and PyTorch for ML models

HBCU-RISE Center for Improving Understanding and Forecasting of Orographic Effects on Extreme Weather (EWC) funded by the National Science Foundation

Fall 2020-Spring 2025

- Conducted multiscale numerical simulations using WRF-ARW on the precursor environment of landfalling TC Hilary (2023)
 - Identified/diagnosed ageostrophic inertial advective wind as dominant source in mid-level jetogenesis and subsequent Mesoscale Convective System formation
 - Manuscript published in MDPI Atmosphere presented at various AMS conferences (see below)
- Designed and conducted diurnal and complex topography sensitivity experiments on the Tubbs Wildfire (2018)
 - Identified diurnal cycle sensitivities which led to decreased downslope wind intensity
 - Diagnosed complex terrain induced Hydraulic Jumps
 - Findings presented at an AMS conference (see below)

Looking Forward Environment, Climate & Environmental Justice. Improving Prediction of Flooding Associated with Tropical Cyclones in Eastern North Carolina funded by NC A&T / UNC Chapel Hill
Spring 2023 – Summer 2024

- Designed and Conducted WRF-ARW simulations of Hurricane Florence (2018) along NC coast
- Modified thermodynamics and moisture variables through a pseudo-global warming approach
 - Past climate observations – 1968 and 1998
 - Future climate scenarios – CESM RCP6.0 and RCP 8.5 for 2038 and 2068

HBCU-Excellence in Research: Dynamics of Orographic Effects on Major Wildfires that Occurred in the Southwest United States under Diverse Mesoscale Environments funded by the National Science

Foundation

Fall 2020-Spring 2023

- Conducted WRF-ARW Simulations of the precursor environment of the Tubbs Fire (2018)
 - Diagnosed Bore Genesis and Hydraulic Jumps to be conducive to adiabatic air parcel compression
 - Findings presented at AMS conferences and published in MAAAP (see below)
- Performed data analysis and visualization for various meteorological fields for the Yarnell Hill Fire simulations
 - Two manuscripts published: Fire and Climate (see below)

Graduate Teaching and Teaching Assistant *NC A&T State University*

General Physics Instructor

Fall 2020 – Fall 2024 (12 sections)

- Taught General Physics II Labs covering electricity and magnetism to undergraduate students
 - Preparing, giving lectures, grading homework and projects

Atmospheric Science TA

Spring 2025, Spring 2024: Numerical Weather Prediction (Grad)

Spring 2025: Atmospheric Modeling

Fall 2024: Orographic Precipitating Systems (Grad)

Fall 2024, Spring 2024, Spring 2023, Spring 2022: Weather Research and Forecasting Model Tutorial

Spring 2024, Spring 2022, Spring 2021: Atmospheric Thermodynamics

Fall 2023: Dynamic Meteorology (Grad)

Fall 2023: Atmospheric Dynamics I

Spring 2023: Atmospheric Dynamics II

- Provided in-class weekly or biweekly tutorials, proctored exams, graded homework and exams

Internship *Department of Homeland Security, NC A&T, UNC Chapel Hill*

Summer 2020

Combined Atmospheric-Storm Surge Modeling of Hurricane Florence (2018) via the Weather Research and Forecasting Model.

Volunteering *American Meteorological Society*

Student Volunteer AMS 21st Conference on Mesoscale Processes

Boise, Idaho, 23-26 June 2025

Student Volunteer AMS 21st Conference on Mountain Meteorology

Boise, Idaho, 22-26 July 2024

Mentorship & Student Research Supervision *NC A&T State University*

Pilson, E.B., Wiles, J.T., Lin, YL. Modeling Study of the CROCUS IOP2 Light Precip. Event July 2024 (Fall 2025)

Smalls, T.J., Wiles, J.T., Lin, YL. Numerical Simulation and Literature Review of Hurricane Ida (2021) with a Focus on its Re-intensification after Landfall” (Fall 2023 - Spring 2024)

The role of African Easterly Waves on tropical storm or hurricane development over the eastern Atlantic Ocean. Undergraduate Research Class (PHYS 494). Daina Wilson (Fall 2023)

Hurricane Ida and the Brown Ocean Effect Literature Review. (ASME 496). Davion Huggins (Spring 2023)

EDUCATION

Doctor of Philosophy NC A&T State University
Atmospheric Science

Expected Graduation: Summer 2027

GPA: 3.96/4.0

Master of Science NC A&T State University
Physics: Concentration in Atmospheric Science

Graduation: May 2022

GPA: 3.94/4.0

Bachelor of Science NC A&T State University
Atmospheric Science and Meteorology

Graduation: May 2020

GPA: 3.79/4.0

Institutional Honors: Summa Cum Laude

Associate of Arts Surry Community College
Graduation: May 2017

GPA: 3.647/4.0

PUBLICATIONS

Wiles, J. T., Lin, Y.-L., & Liu, L. (2026). Numerical Weather Prediction of Hurricane Florence (2018) and Potential Climate Impacts Through Thermodynamic and Moisture Modification. *Atmosphere*, 17(5), 438. <https://doi.org/10.3390/atmos17050438>

Wiles, J. T., Kaplan, M. L., & Lin, Y.-L. (2026). Multiscale Dynamics Organizing Heavy Precipitation During Tropical Cyclone Hilary's (2023) Remnant Passage over the Southwestern U.S. *Atmosphere*, 17(1), 82. <https://doi.org/10.3390/atmos17010082>

Wiles, J.T., Lin, Y.L. & Kaplan, M.L. Multi-scale numerical simulations of the synoptic environment, Diablo windstorm, and wildfire formation mechanisms for the Tubbs Fire (2017). *Meteorol Atmos Phys* 136, 5 (2024). <https://doi.org/10.1007/s00703-023-01001-z>

Kaplan, M.L.; Karim, S.M.S.; Wiles, J.T.; James, C.N.; Lin, Y.-L.; Riley, J. Convective Density Current Circulations That Modulated Meso- γ Surface Winds near the Yarnell Hill Fire. *Fire* 2023, 6, 130. <https://doi.org/10.3390/fire6040130>

(Master's Thesis) Wiles, J. T.; Lin, Y.-L.; Kaplan, M.L. (2022). Synoptics, Dynamics, and Numerical Weather Prediction of the Tubbs Fire Environment Conducive to Wildfire Formation (Order No. 29068837). Available from ProQuest One Academic. (2702160864). Retrieved from <http://ncat.idm.oclc.org/login?url=https://www.proquest.com/dissertations-theses/synoptics-dynamics-numerical-weather-prediction/docview/2702160864/se-2>

Kaplan, M.L.; James, C.N.; Ising, J.; Sinclair, M.R.; Lin, Y.-L.; Taylor, A.; Riley, J.; Karim, S.M.S.; Wiles, J. The Multi-Scale Dynamics Organizing a Favorable Environment for Convective Density Currents That Redirected the Yarnell Hill Fire. *Climate* 2021, 9, 170. <https://doi.org/10.3390/cli9120170>

CONFERENCE PRESENTATIONS

Wiles, Jackson Tyler (Presenter); Kaplan, Michael L., Lin, Yuh-Lang, "Numerical Simulations of the Multi-scale Processes Causing Heavy Precipitation during Hurricane Hilary's (2023) Passage over Complex Terrain in the Southwestern U.S." (2024). The 21st AMS Conf. on Mesoscale Processes, Boise, ID

23-26 June 2025 <https://ams.confex.com/ams/52BC21Meso/meetingapp.cgi/Session/71075>

Wiles, Jackson Tyler (Presenter); Lin, Yuh-Lang; Liu, Liping, "Numerical Weather Prediction of Hurricane Florence (2018) and Potential Climate Impacts through Thermodynamic Modification". 2025 Dr. Ronald E McNair Symposium and Grad Fair. 24-26 January 2025. NC A&T Campus

Wiles, Jackson Tyler (Presenter); Kaplan, Michael L., Lin, Yuh-Lang, "Numerical Weather Prediction of the Synoptic to Mesoscale Processes Leading to Heavy Precipitation during Hurricane Hilary's (2023) Passage over Complex Terrain in the Southwestern U.S." (2024). The 21st AMS Conf. on Mountain Meteorology, Boise, ID 22-26 July 2024

<https://ams.confex.com/ams/21MOUNTAIN/meetingapp.cgi/Session/69146>

Wiles, Jackson Tyler (Presenter); Lin, Yuh-Lang; Liu, Liping, "Numerical Weather Prediction of Hurricane Florence (2018) and Potential Climate Impacts through Thermodynamic Modification: Synoptic and Mesoscale Dynamics" (2024). 36th AMS Conf. on Hurricanes and Tropical Meteorology, Long Beach, CA. 6-10 May 2024

<https://ams.confex.com/ams/36Hurricanes/meetingapp.cgi/Paper/442150>

Wiles, Jackson Tyler (Presenter); Kaplan, Michael L.; Lin, Yuh-Lang, "Dynamics of Orographic and Thermal Forcing on the Environment Conducive to the Formation of the Tubbs Fire (2017)" (2023). 20th AMS Conf. on Mesoscale Processes, Madison, WI., 17-21 July 2023

<https://ams.confex.com/ams/WAFNWPMS/meetingapp.cgi/Paper/425056>

Karim, S.M.S., Wiles, J. T., and Lin, Y.-L., 2023: Investigate the Forcing Mechanisms Leading to the Formation of the African Easterly Waves Preceding the Genesis of Hurricanes in the Atlantic Ocean. 20th AMS Conf. on Mesoscale Processes, Madison, WI., 17-21 July 2023

Kaplan, M. L., S. M. S. Karim, J. T. Wiles, C. N. James, Y.-L. Lin, and J. Riley, 2023: Convective Density Current Circulations that Modulated Meso- γ Surface Winds Near the Yarnell Hill Fire. 14th AMS Conf. on Forest and Fire Meteorology, Minneapolis, MN., 1-4 May 2023.

Wiles, Jackson (Presenter); Lin, Yuh-Lang; Kaplan, Michael, "Multi-scale Analyses of the Mountain Wave Dynamics Conducive to Intensification and Propagation of the Tubbs Fire (2017)" (2022). 20th Conference on Mountain Meteorology, American Meteorological Society,

<https://ams.confex.com/ams/20MOUNTAIN/meetingapp.cgi/Paper/402957>

Wiles, Jackson (Presenter); Kaplan, Michael; James, Curtis; Ising, Jan; Karim, Shak M. S.; Lin, Yuh-Lang; Riley, Justin, "Complex Interactions Among Convective Density Currents, Terrain Heating, Channeling, and Blocking Leading to Erratic Wildfire Motions During the Yarnell Hill Fire" (2022). 20th Conference on Mountain Meteorology, American Meteorological Society,

<https://ams.confex.com/ams/20MOUNTAIN/meetingapp.cgi/Paper/402881>

Wiles, Jackson (Presenter); Johnson, Tiana; Liu, Liping; Luettich, Rick, "Atmospheric Modeling of Hurricane Florence (2018)" (May 2021) U.S. Department of Homeland Security Centers of Excellence Summit.

SKILLS

Professional: Communication, Public Speaking, Critical Thinking, Teamwork, Networking, Microsoft Office Suite.

Technical: Research, WRF-ARW, Data Analysis, NCL, Python, Linux/Unix