Curriculum Vitae
Jacob D. Carstens

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General Information

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Twitter:	@JakeCarstens
Website:	https://carstensweather.com (In construction)

Professional Preparation

Currently Enrolled	Doctor of Philosophy, Florida State University, Meteorology. Advised by Dr. Allison Wing. Expected Graduation: July 2022
2019	Master of Science, Florida State University, Meteorology
2017	Bachelor of Science, Florida State University, Meteorology

Additional Research Training

2015-2017	Undergraduate Research Assistant, Center for Ocean-Atmospheric Prediction Studies (COAPS), Tallahassee, Florida. Responsible for quality control testing of research vessel sea surface temperature data, and analysis of monthly FSU Indian Ocean wind stress product

Awards

Member of the Year - North Florida Chapter of the American Meteorological Society/National Weather Association (2016)

Orville Family Endowed Scholarship - American Meteorological Society (AMS, 2016)

Local Chapter of the Year – AMS (2020, as North Florida Chapter President)

Best Lightning Talk – 4th Midwest Student Conference on Atmospheric Research (2020)

Student Travel Award – Grant awarded for research to be presented at the 34th Conference on Hurricanes and Tropical Meteorology, May 2021 (postponed from May 2020 due to COVID-19)

Current Membership in Professional Organizations

American Geophysical Union – Student member

American Meteorological Society – National student member, 2016-2017 Vice President and 2019-2020 President of North Florida Local Chapter

National Weather Association – 2016-2017 Vice President and 2019-2020 President of North Florida Local Chapter

Publications

Refereed Journal Articles

Carstens, J. D., & A. A. Wing (2020). Tropical cyclogenesis from self-aggregated convection in numerical simulations of rotating radiative-convective equilibrium. *J. Adv. Model. Earth Syst.*, **12**, e2019MS002020, doi:10.1029/2019MS002020.

Carstens, J. D., & A. A. Wing (2021). A spectrum for convective self-aggregation based on background rotation. In prep.

Carstens, J. D., C. K. Uejio, & A. A. Wing (2021). Climate change influences on tropical cyclones, and their relevance for risk in Florida. In planning.

Carstens, J. D., & A. A. Wing (2022). Spontaneous convective self-aggregation and tropical cyclones from radiative-convective equilibrium on the beta-plane. Research in progress.

Carstens, J. D., A. A. Wing, D. R. Chavas, J. P. Dunion, M. E. O'Neill, & M. V. Kopelman (2022). Using dropsondes to estimate tropical cyclone moist static energy variability: Modeling and observational perspectives. Research in progress.

Theses

Carstens, J. D. (2017). North Atlantic and Northeast Pacific tropical cyclone intensity comparison using integrated kinetic energy. Florida State University. Accessible at http://diginole.lib.fsu.edu/islandora/object/fsu%3A407369.

Carstens, J. D. (2019). Tropical cyclogenesis from self-aggregated convection in numerical simulations of rotating radiative-convective equilibrium. Florida State University. Accessible at http://diginole.lib.fsu.edu.

Presentations

Nonrefereed Presentations at Conferences

Carstens, J. D., S. R. Smith, M. A. Bourassa, & J. J. Rolph (2016). Examination of SAMOS sea temperature biases. Poster presentation at the Fourth International Workshop on the Advances in the Use of Historical Marine Climate Data (MARCDAT-IV), National Oceanography Centre, Southampton, UK.

Carstens, J. D., & V. Misra (2017). North Atlantic and East Pacific tropical cyclone intensity comparison with integrated kinetic energy. Poster presentation at the 97th American Meteorological Society Annual Meeting, Seattle, Washington.

Carstens, J. D., & A. A. Wing (2019). Tropical cyclogenesis from self-aggregated convection in idealized numerical simulations: Sensitivity to planetary vorticity. Poster presentation at the 99th American Meteorological Society Annual Meeting, Phoenix, Arizona.

Carstens, J. D., & A. A. Wing (2020). Pathways to tropical cyclogenesis in rotating radiative-convective equilibrium simulations. Poster presentation at the 100th American Meteorological Society Annual Meeting, Boston, Massachusetts.

Carstens, J. D., & A. A. Wing (2020). A spectrum for convective self-aggregation based on background rotation. Oral presentation at the 4th Midwest Student Conference on Atmospheric Research, Urbana, Illinois (***Award Winner***).

Carstens, J. D., & A. A. Wing (2021). Tropical cyclogenesis mechanisms in radiative-convective equilibrium simulations of varying rotation. Abstract submitted for the American Meteorological Society 34th Conference on Hurricanes and Tropical Meteorology, New Orleans, Louisiana.

Carstens, J. D., M. V. Kopelman, & A. A. Wing (2021). Estimating moist static energy and surface enthalpy flux variance in a mature hurricane: Modeling and an observational case study. Abstract submitted for the American Meteorological Society 34th Conference on Hurricanes and Tropical Meteorology, New Orleans, Louisiana.

Other Presentations

Carstens, J. D. A spectrum for convective self-aggregation based on background rotation. Florida State University Meteorology Seminar, 21 January 2021, Tallahassee, Florida.

Carstens, J. D. On the 2020 hurricane season… And enduring it as a TC-focused grad student. West Central Florida AMS Chapter Meeting, 21 January 2021, Tampa, Florida.

Carstens, J. D. Tips for the atmospheric science graduate school experience. Northeastern Storm Conference, 24 April 2021, Lyndonville, Vermont.

Carstens, J. D. What goes into a hurricane forecast? City of Tallahassee Hurricane PREP Workshop, 8 June 2021, Tallahassee, Florida.

Teaching

Teaching Assistant

MET 4301 – Atmospheric Dynamics I (Fall 2020). **Course description**: Atmospheric dynamics is the study of motion in the atmosphere. Understanding the basic nature of atmospheric flow is critical to understanding the origin and evolution of all weather and climate phenomena. In this course, students learn how to apply fundamental principles of mechanics and thermodynamics (e.g., conservation of momentum, mass, and energy) to derive a set of equations governing atmospheric flow. Students learn how use these governing equations in order to gain insight into the basic nature of atmospheric flow, including the dynamics of vorticity and circulation.

Primary Instructor

MET 2507 – Weather Analysis and Forecasting (Spring 2021). **Course description**: This course is an introduction to meteorological observations, data, codes, and scalar analysis practices. Weather applications software systems and computing environments for meteorological analysis and weather forecasting techniques are examined.

Service

FSU Department Service

Vice President – North Florida Chapter of the American Meteorological Society/National Weather Association ("AMS/NWA", 2016-2017)

Wednesday Producer – "FSU Weather" broadcast meteorology television show (2016-2017)

President – Chi Epsilon Pi Meteorology Honor Society (2017-2019)

President – North Florida Chapter of the AMS/NWA (2019-2020)

FSU University Service

Mathematics and Physics Tutor – FSU Libraries (2015)

Mathematics, Physics, Environmental Science, and Meteorology Tutor – FSU Student-Athlete Academic Services (2017-2019)

Outside Service

Member – AMS Student Conference Planning Committee (2021-2022)

Features in News Articles

Florida State University News – "Hurricanes from scratch: FSU researchers find even small disturbances can trigger catastrophic storms". 13 May 2020. https://news.fsu.edu/news/science-technology/2020/05/13/hurricanes-from-scratch-fsu-researchers-find-even-small-disturbances-can-trigger-catastrophic-storms/

National Science Foundation Research News – "Even small disturbances can trigger catastrophic hurricanes, researchers find". 19 May 2020. https://nsf.gov/discoveries/disc_summ.jsp?cntn_id=300610&org=GEO&from=news

WCTV Tallahassee – "Federal meteorologists unable to attend annual meeting due to shutdown". 11 January 2019. https://www.wctv.tv/content/news/The-government-shutdown-had-a-ripple-effect-Federal-meteorologists-missed-out-on-large-annual-meeting-504239331.html

"FSU grad student attempting to solve the mystery of hurricane formation". 22 May 2020. https://www.wctv.tv/content/news/FSU-grad-student-attempting-to-solve-the-mystery-of-hurricane-formation-570700901.html

Forbes – "2 tropical storms aren't going to merge into a megastorm – here's why". 22 August 2020. https://www.forbes.com/sites/marshallshepherd/2020/08/22/2-tropical-storms-arent-going-to-merge-into-a-megastormheres-why/?sh=50f5cc74744d

American Geophysical Union Eos – "Storms interact but rarely merge into bigger tempests". 26 August 2020. https://eos.org/articles/storms-interact-but-rarely-merge-into-bigger-tempests

CNN – "This relentless Atlantic hurricane season has put nearly every mile of coastline from Texas to Maine on alert". 13 November 2020. https://www.cnn.com/2020/11/13/weather/2020-hurricane-season-records-texas-to-maine/index.html

CBS – "The record-shattering 2020 hurricane season, explained". 20 November 2020. https://www.cbsnews.com/news/atlantic-hurricane-season-2020-record-breaking/

The Houston Chronicle – "Watch 2020's record-breaking hurricane season unfold in 76 seconds". 23 November 2020. https://www.chron.com/weather/article/Houston-hurricane-maps-forecast-2020-15748011.php

The Weather Channel – "Watch: The 2020 hurricane season summed up in 76 seconds". 24 November 2020. https://weather.com/storms/hurricane/video/the-2020-hurricane-season-summed-up-in-76-seconds