FALKO JUDT

fjudt@ucar.edu | (303) · 497 · 8246
National Center for Atmospheric Research
P.O. Box 3000 | Boulder, Colorado 80307

RESEARCH INTERESTS

predictability and dynamics of high impact weather, tropical meteorology, tropical cyclones, numerical weather prediction, ensemble forecasting, air-sea interaction, stochastic modeling

PROFESSIONAL EXPERIENCE

Scientist I, Mesoscale and Microscale Meteorology Laboratory *2018–present*
National Center for Atmospheric Research (NCAR)

Postdoctoral Fellow, Advanced Study Program *2016–2017*
NCAR

Postdoctoral Associate *2015*
Department of Ocean Sciences, University of Miami

Research Assistant *2007–2014*
Division of Meteorology and Physical Oceanography, University of Miami

EDUCATION

Rosenstiel School of Marine and Atmospheric Science
University of Miami, Miami, Florida
Ph.D. in Meteorology & Physical Oceanography *2014*
Advisor: Shuyi S. Chen, Ph.D.

M.S. in Meteorology & Physical Oceanography *2009*
Advisor: Shuyi S. Chen, Ph.D.

Exchange Student at the University of Miami *2006–2007*

University of Leipzig, Leipzig, Germany
Vordiplom **(intermediate exam) in Physics & Meteorology** *2005*

AWARDS AND HONORS

Early Career Scientist Best Poster Award, **5th WGNE Workshop** *2017*
on Systematic Errors in Weather and Climate Models

NCAR Strategic Capability Computing Support (3,000,000 Yellowstone core-hours) *2016*
Project Title: A Global High-Resolution Predictability Experiment with MPAS

NCAR Advanced Study Program Postdoctoral Fellowship *2015*

NOAA Climate and Global Change Postdoctoral Fellowship *2015 (declined)*

Best Student Seminar in Meteorology and Physical Oceanography, **Rosenstiel School** *2014*
of Marine and Atmospheric Science

Outstanding Poster Presentation, **94th American Meteorological Society Annual Meeting,**
2014

26th Conference on Weather Analysis / 22nd Conference on Numerical Weather Prediction

Koczy Fellowship, **Rosenstiel School of Marine and Atmospheric Science**   *2013*
Support for an outstanding graduate student in his/her final year.

Best Student Paper in Meteorology and Physical Oceanography, **Rosenstiel School of**   *2011*
Marine and Atmospheric Science

REFEREED PUBLICATIONS

Fox, K. R., and Judt, F., 2018: A Numerical Study on the Extreme Intensification of Hurricane Patricia (2015). *Wea. Forecasting,* https://doi.org/10.1175/WAF-D-17-0101.1, in press.

Judt, F., 2018: Insights into Atmospheric Predictability through Global Convection-Permitting Model Simulations. *J. Atmos. Sci.,* **75,** 1477–1497, doi:10.1175/JAS-D-17-0343.1

Zadra, A., K. Williams, A. Frassoni, M. Rixen, A. Adames, J. Berner, F. Bouyssel, B. Casati, H. Christensen, M. Ek, G. Flato, Y. Huang, F. Judt, H. Lin, E. Maloney, W. Merryfield, A. van Niekerk, T. Rackow, K. Saito, N. Wedi, and P. Yadav, 2018: Systematic Errors in Weather and Climate Models: Nature, Origins, and Way Forward. *Bull. Amer. Meteor. Soc.,* **99(4),** ES67-ES70, doi:10.1175/BAMS-D-17-0287.1.

E. A. DflAsaro, A. Y. Shcherbina, J. M. Klymak, J. Molemaker, G. Novelli, C. M. Guigand, A. C. Haza, B. K. Haus, E. H. Ryan, G. A. Jacobs, H. S. Huntley, N. J. M. Laxague, S. S. Chen, F. Judt, J. C. McWilliams, R. Barkan, A. D. Kirwan, Jr., A. C. Poje, and T. M. Ozgokmen, 2018: Ocean Convergence and the Dispersion of Flotsam. *Proc. Natl. Acad. Sci. U. S. A.,* **115(6),** 1162–1167, doi:10.1073/pnas.1718453115

Judt, F., and S. S. Chen, 2016: Predictability and Dynamics of Tropical Cyclones Rapid Intensification Deduced from High-Resolution Stochastic Ensembles. *Mon. Wea. Rev.,* **144,** 4395–4420. doi: 10.1175/MWR-D-15-0413.1

Judt, F., S. S. Chen, and M. Curcic, 2016: Atmospheric Forcing of the Upper Ocean Transport in the Gulf of Mexico: From Seasonal to Diurnal Scales. *J. Geophys. Res. Oceans,* **121,** 4416–4433. doi: 10.1002/2015JC011555

Judt, F., S. S. Chen, and J. Berner, 2016: Predictability of Tropical Cyclone Intensity: Scale-Dependent Forecast Error Growth in High-Resolution Stochastic Kinetic-Energy Backscatter Ensembles. *Quart. J. Roy. Meteor. Soc.,* **142,** 43–57. doi: 10.1002/qj.2626

Chen, S. S., B. W. Kerns, N. Guy, D. P. Jorgensen, J. Delano, N. Viltard, C. Zappa, F. Judt, C.-Y. Lee, and A. Savarin, 2016: Aircraft Observations of Dry Air, ITCZ, Convective Cloud Systems and Cold Pools in MJO During DYNAMO. *Bull. Amer. Meteor. Soc.,* **97,** 405–423. doi: 10.1175/BAMS-D-13-00196.1

Judt, F., and S. S. Chen, 2015: A New Aircraft Hurricane Wind Climatology and Applications in Assessing the Predictive Skill of Tropical Cyclone Intensity using High-Resolution Ensemble Forecasts. *Geophys. Res. Let.,* **42,** 6043–6050. doi: 10.1002/2015GL064609

Coelho E., P. Hogan, G. Jacobs, P. Thoppil, H. Huntley, B. Haus, B. Lipphardt, Jr., A. D. Kirwan, Jr., E. H. Ryan, J. Olascoaga, G. Novelli, F. Beron-Vera, A. C. Haza, A. C. Poje, A. Griffa, T.M. Ozgokmen, D. Bogucki, S. Chen, M. Curcic, M. Iskandarani, F. Judt, N. Laxague, A. J. Mariano, A. J. H. M. Reniers, C. Smith, A. Valle-Levinson, and M. Wei, 2015: Ocean Current Estimation Using a Multi-Model Ensemble Kalman

Filter During the Grand Lagrangian Deployment Experiment (GLAD). *Ocean Model.,* **87,** **86–106. doi: 10.1016/j.ocemod.2014.11.001**

Judt, F. and S. S. Chen, 2014: An Explosive Convective Cloud System and its Environmental Conditions in MJO Initiation Observed during DYNAMO. *J. Geophys. Res. Atmos.,* **119, 2781–2795. doi: 10.1002/2013JD021048**

Jacobs, G. A., B. Bartels, D. Bogucki, F. J. Beron-Vera, S. S. Chen, E. F. Coelho, M. Curcic, A. Griffa, M. Gough, B. K. Haus, A.C. Haza, R. W. Helber, P. J. Hogan, H. Huntley, M. Iskandarani, F. Judt, A. D. Kirwan Jr., N. Laxague, A. Valle-Levinson, B. Lipphardt, A. Mariano, H. E. Ngodock, G. Novelli, M. J. Olascoaga, T. M. Ozgokmen, P. G. Thoppil, A. C. Poje, A. J. H. M . Reniers, C. D. Rowley, E. H. Ryan, S. R. Smith, P. L. Spence, and M. Wei, 2014: Data Assimilation Considerations for Improved Ocean Predictability during the Gulf of Mexico Grand Lagrangian Deployment (GLAD), *Ocean Model.,* **83, 98–117. doi: 10.1016/j.ocemod.2014.09.003**

Judt, F., and S. S. Chen, 2013: Reply to "Comments on 'Convectively Generated Potential Vorticity in Rainbands and Formation of the Secondary Eyewall in Hurricane Rita of 2005'". *J. Atmos. Sci.,* **70, 989–992. doi: 10.1175/JAS-D-12-0151.1**

Judt, F., and S. S. Chen, 2010: Convectively Generated Potential Vorticity in Rainbands and Formation of the Secondary Eyewall in Hurricane Rita of 2005. *J. Atmos. Sci.,* **67, 3581–3599. doi: 10.1175/2010JAS3471**

MANUSCRIPTS IN PREPARATION

Judt, F., Atmospheric Predictability Characteristics of the Tropics, Midlatitudes, and Polar Regions Deduced from Global Convection-Permitting MPAS Simulations. To be submitted to *J. Atmos. Sci.*

NON-REFEREED PUBLICATIONS

Judt, F., 2017: How strong can a hurricane get? *Physics Today,* **doi:10.1063/PT.6.1.20170908a.** http://physicstoday.scitation.org/do/10.1063/PT.6.1.20170908a/full/

Judt, F., 2014: Predictability of Tropical Cyclone Intensity. *Open Access Dissertations.* **Paper 1350.** http://scholarlyrepository.miami.edu/oa_dissertations/1350

Judt, F., and S. S. Chen, 2014: Rapid Intensification in Tropical Cyclones: Understanding Physical Processes and Forecast Uncertainly Using High-resolution Stochastic Ensembles. *31st Conference on Hurricanes and Tropical Meteorology,* **San Diego, CA, Amer. Meteor. Soc.,** **14D.9**

Judt, F., 2009: Convectively Generated Potential Vorticity in Rainbands and Secondary Eyewall Formation in Hurricanes (2009). *Open Access Theses.* **Paper 214.** http://scholarlyrepository.miami.edu/oa_theses/214

Judt, F., 2008: Convectively Induced PV and Vortex Rossby Waves in Hurricanes Katrina and Rita (2005). **Preprints,** *28th Conference on Hurricanes and Tropical Meteorology,* **Orlando, FL, Amer. Meteor. Soc., 5C.6**

Judt, F., and S. S. Chen, 2007: Vortex Rossby Waves in Hurricanes Katrina and Rita (2005). *Eos Trans. AGU, 88(52),* **Fall Meet. Suppl., Abstract A21C-0646.**

TECHNICAL PRESENTATIONS

Invited Talks

2018: Tropical Cyclones in Global Convection-Permitting MPAS Simulations.
2nd GEWEX Convection-Permitting Climate Modeling Workshop, **5 September 2018, Boulder, CO.**

2018: Insights into Atmospheric Predictability Through Global Cloud-Resolving Model Simulations
Seminar at Monash University, **23 February 2018, Melbourne, Australia.**

2017: Using Stochastic Ensembles to Quantify the Predictability of Hurricane Intensity.
2nd Boulder Stochastics Meeting, **22 August 2017, Boulder, CO.**

2017: To what extent can we predict the weather?
Seminar at the University of Oklahoma, **4 May 2017, Norman, OK.**

2017: For how long can we predict the weather?
MMM Seminar, **19 April 2017, Boulder, CO.**

2016: Predictability of Tropical Cyclone Intensity.
MMM Seminar, **24 March 2016, Boulder, CO.**

2015: Using Stochastic Ensembles to Better Understand Hurricane Predictability.
Hurricane Ensemble Workshop, **17 November 2015, Miami, FL.**

2015: Predictability of Tropical Cyclone Intensity.
Seminar at the National Hurricane Center, **19 February 2015, Miami, FL.**

2014: Rapid Intensification in Tropical Cyclones - Physical Mechanisms from High-Resolution Models and Ensembles.
Prediction of Tropical Cyclone Rapid Intensity Change (RIC) Workshop, **18–20 November 2014, Miami, FL.**

Conference Presentations

Judt, F., K. R. Fox, and D. Ahijevych, 2018: Tropical Cyclones in Convection-Permitting MPAS Simulations. *2018 Joint WRF/MPAS Users' Workshop,* **Boulder, CO.** [talk]

Judt, F., 2018: Insights into Atmospheric Predictability Through Global Convection-Permitting Model Simulations. *25th Conference on Numerical Weather Prediction,* **Denver, CO.** [talk]

Judt, F., and K. R. Fox, 2018: The Extreme Intensification and Predictability of 2015's Hurricane Patricia. *33rd Conference on Hurricanes and Tropical Meteorology,* **Ponte Vedra Beach, FL.** [talk]

Judt, F., 2018: What is the ultimate limit of weather prediction? — Insights into atmospheric predictability through global cloud-resolving simulations. *Understanding and Modelling Atmospheric Processes,* **Lorne, Australia.** [poster]

Judt, F., 2018: For how long can we predict the weather? *1st Colorado Science Day at the State Capitol,* **Denver, CO.** [poster]

Judt, F., and S. S. Chen, 2017: Effect of Model Error on the Predictability of Hurricane Intensity. *5th WGNE Workshop on Systematic Errors in Weather and Climate Models,* **Montreal, Canada.** [poster]

Judt, F., 2017: For how long can we predict the weather? — Insights into atmospheric predictability from global convection-allowing simulations. *5th WGNE Workshop on Systematic Errors in Weather and Climate Models,* **Montreal, Canada.** [poster]

Judt, F., 2017: A global high-resolution predictability experiment using MPAS. *18th Annual WRF Users' Workshop,* **Boulder, CO.** [talk]

Judt, F., 2017: For how long can we predict the weather? *EGU General Assembly 2017,* **Vienna, Austria.** [talk]

Judt, F., and S. S. Chen, 2017: Concentric Eyewalls in RAINEX and TC Modeling. *2017 AMS Annual Meeting,* **Seattle, WA.** [talk]

Judt, F., 2016: Insights into Atmospheric Predictability Using Global Convection-Allowing Simulations. *2016 AGU Fall Meeting,* **San Francisco, CA.** [poster]

Judt, F., and S. S. Chen, 2016: Size Matters - Evaluating the Predictive Skill of TC Size Forecasts. *32st Conference on Hurricanes and Tropical Meteorology,* **San Juan, Puerto Rico.** [talk]

Judt, F., and S. S. Chen, 2014: Overview of Meteorological Measurements and Coupled Modeling during SCOPE. *CARTHE All Hands Meeting,* **Hollywood, FL.** [talk]

Judt, F., and S. S. Chen, 2014: Rapid Intensification in Tropical Cyclones: Understanding Physical Processes and Forecast Uncertainly Using High-resolution Stochastic Ensembles. *31st Conference on Hurricanes and Tropical Meteorology,* **San Diego, CA.** [talk]

Judt, F., and S. S. Chen, 2013: A Mysterious Convective Explosion and an Equatorial Low Pressure System During MJO Initiation in DYNAMO. *MJO Field Data and Science Workshop,* **Kohala Coast, HI.** [talk and poster]

Judt, F., 2012: Weather Conditions and Forecasts during GLAD. *CARTHE All Hands Meeting,* **Miami, FL.** [talk]

Judt, F., and S. S. Chen, 2012: Understanding Hurricane Intensity Predictability Limits and Model Error Using two Different Ensemble Techniques. *30th Conference on Hurricanes and Tropical Meteorology,* **Ponte Vedra, FL, Amer. Meteor. Soc., 3D.8.** [talk]

Judt, F., 2010: Secondary Eyewall Formation and Convectively-Generated Potential Vorticity in Rainbands in Hurricane Rita. *29th Conference on Hurricanes and Tropical Meteorology,* **Tucson, AZ, Amer. Meteor. Soc., 8C.2B.** [talk]

Judt, F., 2008: Convectively-Induced PV and Vortex Rossby Waves in Hurricanes Katrina and Rita (2005). *28th Conference on Hurricanes and Tropical Meteorology,* **Orlando, FL, Amer. Meteor. Soc., 5C.6.** [talk]

Judt, F., and S. S. Chen, 2007: Vortex Rossby Waves in Hurricanes Katrina and Rita. *2007 AGU Fall Meeting,* **San Francisco, CA, Amer. Geophys. Un., A21C-0646.** [poster]

RESEARCH EXPERIENCE

National Center for Atmospheric Research
Scientist I   *2018–current*
· **Conducting basic research to improve the prediction of high-impact weather.**
· **Using next-generation global weather models, including the Model for Predication Across Scales (MPAS) to investigate the predictability of hurricanes and other severe weather phenomena on time scales from days to weeks.**

· Developing new techniques to analyze data from high-resolution model simulations. Collaborating within NCAR and the scientific community to further understanding of atmospheric predictability, dynamics of extreme weather phenomena, numerical weather prediction and tropical meteorology research.

National Center for Atmospheric Research
ASP Postdoctoral Fellow   *2016–2017*

· Analyzed error growth in convection-allowing global model simulations to investigate atmospheric predictability from convective to planetary scales.

University of Miami
Postdoctoral Associate   *2015–2015*

· Examined the predictability and dynamics of tropical cyclone rapid intensification with stochastic numerical model ensembles.
· Evaluated output from a coupled ocean-wave-atmosphere model with buoy observations to better understand atmosphere-ocean interactions in the Gulf of Mexico.

University of Miami
Research Assistant   *2008–2014*

· Ph.D.-Thesis research: Quantified the predictability of tropical cyclone intensity with high-resolution numerical model ensembles.
· Investigated interactions between deep convection and the environment during initiation of the Madden-Julian Oscillation (MJO) using field experiment observations.
· M.S.-Thesis research: Examined numerical model output and aircraft observations to highlight the role of convectively generated potential vorticity in the secondary eyewall formation in Hurricane Rita of 2005.

University of Miami
International Research Scholar   *2007*

· Analyzed numerical model output and aircraft observations to study vortex Rossby waves and their impact on the intensity changes of Hurricanes Rita and Katrina of 2005.

TEACHING & MENTORING EXPERIENCE

National Center for Atmospheric Research
Research Mentor   *2016, 2017, 2018*

· Designed a research project for and mentored an undergraduate student through the *Significant Opportunities in Atmospheric Research and Science (SOARS)* **program.**

University of Miami
Teaching Assistant   *2009*

· Prepared lectures and graded homework/exams for MSC **243** *Introduction to Weather Forecasting* (undergraduate level).
Instructor: Sharanya Majumdar, Ph.D.

FIELD WORK EXPERIENCE

Grand Lagrangian Deployment (GLAD), Surfzone Coastal Oil Pathways Experiment (SCOPE), Lagrangian Submesoscale Experiment (LASER)
Miami, FL   *2012, 2013, 2016*

· **Provided daily weather/ocean current/wave forecasts to assist with ship/aircraft operations and drifter deployments in the Gulf of Mexico.**

Dynamics of the Madden-Julian Oscillation (DYNAMO)
Diego Garcia, British Indian Ocean Territory   *2011*
· **Processed dropsondes in realtime onboard NOAA's WP-3D research aircraft (6 flights, 200 dropsondes, 52:30 h total flight hours).**
· **Briefed PI team/aircraft crew with daily weather reports to optimize flight plans.**

Weather In-Situ Deployment Optimization Method (WISDOM)
Florida Keys   *2008-2010*
· **Prepared and launched super-pressure balloons that observe data-sparse regions to improve hurricane track forecasts.**

LEADERSHIP ACTIVITIES & COMMUNITY SERVICE

Organizer, Thompson Lecture Series, Advanced Study Program, NCAR   *2017*

Convener and Session Chair, 2016 AGU Fall Meeting, San Francisco, CA   *2016*

Organizer, Research Review Seminars Series, Advanced Study Program, NCAR *2016*

President, Greater Miami Chapter of the AMS   *2009–2015*

Student Seminar Committee (Rosenstiel School of Marine and Atmospheric Science)
2012–2014

EDUCATION & OUTREACH

Participated in the 1st Colorado Science Day at the State Capitol in Denver, CO   *2018*
Participated in the *Canes on Canes* **outreach program, a lecture series that presents** *2012–2015*
hurricane information and preparedness techniques in an approachable way

Provided weather forecasts for the University of Miami's Special Project and Events Office   *2012–2015*

Led map discussions at NOAA's Hurricane Research Division in support   *2009–2015*
of various field programs

Reviewed American Meteorological Society/Industry Minority Scholarship applications
2009–2015

Guided campus tours for prospective students on behalf of the Rosenstiel School   *2010–2011*
of Marine and Atmospheric Science Advancement Office

Judged high school students' research projects at the 2010 Miami-Dade County Science Fair   *2010*

Participated in an Outreach Video Campaign for the University of Miami   *2009*
[available online at http://www.youtube.com/watch?v=ygWJCK2Ww4A]

Speaker at the Rosenstiel School of Marine and Atmospheric Science   *2008*
Hurricane Preparedness Colloquium in Anticipation of Hurricane Ike

PROFESSIONAL ASSOCIATIONS & ACTIVITIES

American Meteorological Society (AMS), Member	*2007–present*
Greater Miami Chapter of the AMS, Member	*2007–2015*
American Geophysical Union (AGU), Member	*2007–present*
Deutsche Meteorologische Gesellschaft (DMG), Member	*2005–present*

Reviewer for: *Journal of the Atmospheric Sciences, Monthly Weather Review, Journal of Geophysical Research, Geophysical Research Letters, Journal of Climate, Journal of Ocean Engineering and Science*

TECHNICAL STRENGTHS

Languages:	**English, French, Spanish, and German (native)**
Computer Languages:	**MATLAB, NCL, Python, Fortran, shell scripting**
Operating Systems:	**Macintosh, Windows, Linux and UNIX**