JAMES HLYWIAK, PH.D.

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RESEARCH INTERESTS

Investigating atmospheric and coupled oceanic and land surface physics for implementation, modification, and evaluation of components of numerical weather prediction systems on scales ranging from the microscale to the global scale. Particular interest lies in enhancing the capability of forecast systems in the boundary layer and surface layer regions of the atmosphere in tropical and coastal environments using multidisciplinary methods.

EDUCATION

University of Miami, Miami, FL *August 2016 - August 2021*
Ph.D in Meteorology and Physical Oceanography
Thesis: Modifications to the Tropical Cyclone Intensity and Wind Structure Resulting from Surface-Boundary Layer Interactions over Coastal and Inland Environments
Advisor: Dr. David S. Nolan

Pennsylvania State University, State College, PA *August 2012 - May 2016*
B.S. in Meteorology *3.79 GPA*
Minors in Mathematics and Marine Sciences

University of Southampton, Southampton, UK *Jan - July 2015*
Study Abroad Program, Marine Science Focus

APPOINTMENTS

Meteorologist *11/18/24 - present*
U.S. Naval Research Laboratory
Marine Meteorology Division, Monterey, CA USA
Boundary Layer Section

Postdoctoral Research Fellow *10/18/21 - 11/15/24*
National Research Council
Host Institution: U.S. Naval Research Laboratory, Monterey, CA, USA
Supervisor: Dr. David D. Flagg

- Performed novel analyses of coastal and littoral atmospheric boundary layer meteorological data, evaluating state-of-the-art numerical weather prediction model solutions of turbulent fluxes and state variables against observations and prevailing theory.
- Developed new atmospheric surface layer turbulent flux parameterization techniques to improve numerical weather prediction capabilities within coastal environments, presenting key findings at high-impact conferences and workshops.
- Assisted in collection of observations and delivered daily forecast briefings used to inform planning and execution of research aircraft science missions during multiple large and interdisciplinary field campaigns in the tropical Atlantic and across four continental U.S. coastal sites.

PEER-REVIEWED PUBLICATIONS

Benbow, C.A., MacMahan, J.H., Thornton, E.B., Collins, P., **Hlywiak, J.**, Curcic, M, Ruiz-Plancarte, J., Flagg, D.D., Wang, Q., and Haus, B. (In Review). Nearshore Winds: Observational Insights and Gaussian Process Regression Analysis. *In review; Journal of Geophysical Research - Oceans.*

Hlywiak, J., Flagg, D.D., Hong, X., Doyle, J.D., Benbow, C., Curcic, M., Darby, B., Drennan, W.M., Graber, H., Haus, B., MacMahan, J., Ortiz-Suslow, D., Ruiz-Plancarte, J., Wang, Q., Williams, N., and Yamaguchi, R. (2023). Evaluating Atmospheric Surface Layer Flux Parameterization within the Coastal Regime. *Monthly Weather Review*, 151(5), 1045-1072 https://doi.org/10.1175/MWR-D-22-0303.1

Hlywiak, J. and Nolan, D.S. (2022). Targeted artificial ocean cooling to weaken tropical cyclones would be futile. *Communications Earth & Environment*, 3, 185, https://doi.org/10.1038/s43247-022-00519-1.

Hlywiak, J. and Nolan, D.S. (2022). The Evolution of Asymmetries in the Tropical Cyclone Boundary Layer Wind Field during Landfall. *Monthly Weather Review*, 150(3), 529-549 https://doi.org/10.1175/MWR-D-21-0191.1

Hlywiak, J. and Nolan, D.S. (2021). The Response of the Near-Surface Tropical Cyclone Wind Field to Inland Surface Roughness Length and Soil Moisture Content During and After Landfall. *Journal of the Atmospheric Sciences* 8(3), 983-1000 https://doi.org/10.1175/JAS-D-20-0211.1

Hlywiak, J. and Nolan, D.S. (2019). The Influence of Oceanic Barrier Layers on Tropical Cyclone Intensity as Determined through Idealized, Coupled Numerical Simulations. *J. Phys. Oceanogr.*, 49, 1723–1745, https://doi.org/10.1175/JPO-D-18-0267.1

Li, R., Palm, B.B., Ortega, A.M., **Hlywiak, J.**, Hu, W., Peng, Z., Day, D.A., Knote, C., Brune, W.H., De Gouw, J.A. and Jimenez, J.L. (2015). Modeling the radical chemistry in an oxidation flow reactor: Radical formation and recycling, sensitivities, and the OH exposure estimation equation. *The Journal of Physical Chemistry A*, 119(19), pp.4418-4432.

CONFERENCE PRESENTATIONS

American Meteorological Society 21st Conference on Mountain Meteorology - *Boise, ID, July 2024*
Oral Presentation: Contrasting the Role of Tall versus Shallow Orography on the Diurnal Evolution of the Marine Atmospheric Boundary Layer over Island Wakes

American Geophysical Union Fall Meeting - *San Francisco, CA, Dec 2023*
Oral Presentation: Towards an Advection-Aware Roughness Length Parameterization for use in Numerical Modeling of the Atmospheric Surface Layer
Poster Presentation: Spatio-temporal evolution of the Marine Atmospheric Boundary Layer over Island Wakes

103rd American Meteorological Society Annual Conference - *Denver, CO, Jan 2023*
Oral Presentation: Surface Layer Parameterization Challenges within the Coastal Zone

35th American Meteorological Society Conference on Hurricanes and Tropical Meteorology - *New Orleans, LA, May 2022*
Oral Presentation: The Evolution of Asymmetries in the Tropical Cyclone Boundary Layer Wind Field during Landfall
Poster Presentation: Evaluation of the Performance of COAMPS in Predicting Vertical Profiles of Wind and Temperature within the Coastal Regime: Initial Results from the Coastal Land-Air-Sea Interaction (CLASI) Departmental Research Initiative

34th American Meteorological Society Conference on Hurricanes and Tropical Meteorology - *Virtual Format, May 2021*
Oral Presentation: Sensitivities of the decay of the near-surface tropical cyclone wind field to inland surface roughness and soil moisture

European Geophysical Union, General Assembly - *Vienna, Austria, April 2019*
Oral Presentation: The Influence of Oceanic Barrier Layers on Tropical Cyclone Intensity as Determined Through Idealized, Coupled Numerical Simulations

33rd American Meteorological Society Conference on Hurricanes and Tropical Meteorology - *Ponte Vedra, FL, April 2018*
Poster Presentation: Coupled 3D Numerical Simulations of the Effects of Ocean Salinity on Tropical Cyclone Intensity

TECHNICAL SKILLS

Programming Languages

- Python
- MATLAB
- FORTRAN
- Julia

Numerical Weather Prediction Modeling Experience
Performance of and/or development within:

- Weather, Research, and Forecasting Model (WRF)
- Coupled Ocean/Atmosphere Mesoscale Prediction System (COAMPS)
- Coupled Ocean/Atmosphere Mesoscale Prediction System for Tropical Cyclones (COAMPS-TC)
- Cloud Model 1 (CM1)
- The Lagrangian Analysis Tool (LAGRANTO)

TEACHING EXPERIENCES

Guest Lecturer, JAPN 410, California State University Monterey Bay *Spring 2023*
Guest Lecturer, ATM 563: Mesoscale Meteorology, University of Miami *Spring 2021*
Teaching Assistant, ATM 243: Weather Forecasting, University of Miami *Spring 2020*
Teaching Assistant, ATM 244: Tropical Meteorology and Forecasting, University of Miami *Fall 2018*

REVIEWS FOR

American Meteorology Society: Journal of the Atmospheric Sciences
American Meteorology Society: Monthly Weather Review
American Meteorology Society: Weather and Forecasting
Geophysical Research Letters
Journal of Geophysical Research: Atmospheres
Journal of Geophysical Research: Oceans
National Science Foundation
Ocean Science
Quarterly Journal of the Royal Meteorological Society

AWARDS AND RECOGNITION

Jerome and Isabella Karle Distinguished Scholar Fellowship *2024*
National Research Council Postdoctoral Fellowship *2021*
University of Miami Fellowship *2016 - 2021*
Chi Epsilon Pi Meteorological Honors Society, Penn State Chapter *2015 - present*
Robert Case Memorial Scholarship *2015/16 Academic Year*

John G. Miller Scholarship *2013/14 Academic Year*

Penn State Freshman President's Award *Spring 2013*