

JASON P. DUNION

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EDUCATION:

Ph.D. in Atmospheric Science, 2016, *University at Albany-SUNY*, Albany, NY
M.S. in Atmospheric and Oceanic Science, 1999, *University of Wisconsin-Madison*, Madison, WI
B.A. in Geography/concentration in Geology, 1992, *University of New Hampshire*, Durham, NH

EXPERIENCE:

October 2009 - Present

Meteorologist, University of Miami/RSMAS/CIMAS and NOAA/Atlantic Oceanographic and Meteorological Laboratory/Hurricane Research Division, Miami, FL

- Director, NOAA Advancing the Prediction of Hurricanes Experiment (APHEX) Hurricane Field Program
- Science Director, NOAA Intensity Forecasting Experiment (IFEX) Hurricane Field Program
- Product development team member, National Hurricane Center GOES-R Proving Ground
- Deputy PI, NOAA Unmanned Aircraft Systems SHOUT program
- Developing satellite algorithms for monitoring and studying the tropical cyclone diurnal cycle
- Developed an updated climatology of the North Atlantic and Caribbean Sea atmosphere

July 2006 – September 2009

Meteorologist, NOAA/AOML/Hurricane Research Division, Miami, FL

- Developed new multi-spectral imagery for tracking Saharan dust storms using geostationary satellites
- Acted as Director of NOAA/HRD's Hurricane Field Program during the 2006 Atlantic hurricane season
- Acted as Principal Investigator during several 2006 NOAA G-IV and P-3 Orion aircraft research missions to investigate the Saharan Air Layer and its impact on tropical cyclone intensity change.
- Member, NASA African Monsoon Multidisciplinary Analyses (NAMMA) science team

November 1999 – July 2006

Meteorologist, University of Miami/RSMAS/CIMAS and NOAA/Atlantic Oceanographic and Meteorological Laboratory/Hurricane Research Division, Miami, FL

- Acted as Principal Investigator during several 2005 NOAA G-IV aircraft research missions to investigate the Saharan Air Layer and its impact on tropical cyclone intensity change.
- Developed and refined techniques for improving current surface adjustment algorithms of aircraft flight-level wind data.
- Reconstructed wind fields for several of the 20th century's catastrophic landfalling hurricanes, including 1960 Hurricane Donna and 1965 Hurricane Betsy.
- Developed and operational algorithm for tracking low-level cloud-drift satellite winds using the 3.9 micron channel on the GOES-8 and 10 satellites as well as a variety of satellite derived wind products for tracking tropical cyclones.
- Developed satellite techniques for monitoring the position of the Saharan Air Layer to facilitate investigation of its impact on Atlantic tropical cyclones.

June 1999 - November 1999

Meteorologist, Cooperative Institute for Meteorological Satellite Studies (CIMSS), University of Wisconsin Madison

- Developed and implemented a real-time product for tracking the motion of tropical waves using low-level satellite winds.
- Implemented a real-time shear analysis product for use by the research and forecasting community.

- Researched and developed products related to the surface adjustment of GOES low-level cloud-drift winds as well as the generation of satellite winds utilizing the 3.9 micron channel on the GOES-8 and 10 satellites.

PEER REVIEWED JOURNAL PUBLICATIONS

- Scott, S. R., **Dunion, J. P.**, Olson, M. L., & Gay, D. A. (2021). Lead Isotopes in North American Precipitation record the presence of Saharan Dust, *Bulletin of the American Meteorological Society* (published online ahead of print 2021). Retrieved Oct 27, 2021, from <https://journals.ametsoc.org/view/journals/bams/aop/BAMS-D-20-0212.1/BAMS-D-20-0212.1.xml>
- Zawislak, J., Rogers, R. F., Aberson, S. D., Alaka, G. J., Jr., Alvey, G., Aksoy, A., Bucci, L., Cione, J., Dorst, N., **Dunion, J.**, Fischer, M., Gamache, J., Gopalakrishnan, S., Hazelton, A., Holbach, H. M., Kaplan, J., Leighton, H., Marks, F., Murillo, S. T., Reasor, P., Ryan, K., Sellwood, K., Sippel, J. A., & Zhang, J. A. (2021). ACCOMPLISHMENTS OF NOAA'S AIRBORNE HURRICANE FIELD PROGRAM AND A BROADER FUTURE APPROACH TO FORECAST IMPROVEMENT, *Bulletin of the American Meteorological Society* (published online ahead of print 2021). Retrieved Oct 27, 2021, from <https://journals.ametsoc.org/view/journals/bams/aop/BAMS-D-20-0174.1/BAMS-D-20-0174.1.xml>
- Christophersen, H. W., Dahl, B. A., **Dunion, J. P.**, Rogers, R. F., Marks, F. D., Atlas, R., & Blackwell, W. J. (2021). Impact of TROPICS Radiances on Tropical Cyclone Prediction in an OSSE, *Monthly Weather Review*, *149*(7), 2279-2298. Retrieved Oct 27, 2021, from <https://journals.ametsoc.org/view/journals/mwre/149/7/MWR-D-20-0339.1.xml>
- Xian, P., P.J. Klotzbach, **J.P. Dunion**, M.A. Janiga, J.S. Reid, Peter R. Colarco, and Zak Kipling. Revisiting the relationship between Atlantic dust and tropical cyclone activity using aerosol optical depth reanalyses: 2003-2018, 2020: *Atmos. Chem. Phys.*, *20*, 15357-15378, <https://doi.org/10.5194/acp-20-15357-2020>.
- Zhang, J.A., **J.P. Dunion**, and D.S. Nolan, 2020: In-situ observations of the diurnal variation in the boundary layer of mature hurricanes, *Geophys. Res. Lett.*, *47*, 2019GL086206, <https://doi.org/10.1029/2019GL086206>.
- Tymochko, S., E. Munch, **J. Dunion**, K. Corbosiero, and R. Torn, 2020: Using persistent homology to quantify a diurnal cycle in hurricanes. *Pattern Recognition Letters*, *133*, 137-143. <https://doi.org/10.1016/j.patrec.2020.02.022>
- Wick, G. A., Dunion, J. P., Black, P. G., Walker, J. R., Torn, R. D., Kren, A. C., Aksoy, A., Christophersen, H., Cucurull, L., Dahl, B., English, J. M., Friedman, K., Peevey, T. R., Sellwood, K., Sippel, J. A., Tallapragada, V., Taylor, J., Wang, H., Hood, R. E., & Hall, P. (2020). NOAA's Sensing Hazards with Operational Unmanned Technology (SHOUT) Experiment Observations and Forecast Impacts, *Bulletin of the American Meteorological Society*, *101*(7), E968-E987. Retrieved Oct 27, 2021, from <https://journals.ametsoc.org/view/journals/bams/101/7/bamsD180257.xml>
- **Dunion, J.P.**, C.D. Thorncroft, and D.S. Nolan. 2019: Tropical cyclone diurnal cycle signals in a hurricane nature run. *Mon. Wea. Rev.*, *147*, 363-388, <https://doi.org/10.1175/MWR-D-18-0130.1>
- **Dunion, J.P.**, C.D. Thorncroft, C.S. Velden, and B. McNoldy, 2018: The TC diurnal cycle: The landfall before the landfall. *Bull. Amer. Meteor. Soc.*, *99*, 2452- 2453.
- Blackwell, W. J., S. Braun, R. Bennartz, C. Velden, M. DeMaria, R. Atlas, **J. Dunion**, F. Marks, R. Rogers, B. Annane, and R.V. Leslie, 2018: An overview of the TROPICS NASA Earth Venture Mission. *Q.J.R. Meteorol. Soc.*, *144*, 16-26.
- Bowers, G.S., D.M. Smith, N.A. Kelley, G.F. Martinez-McKinney, S.A. Cummer, J.R. Dwyer, S. Heckman, R.H. Holzworth, F. Marks, P. Reasor, J. Gamache, **J. Dunion**, T. Richards, and H.K. Rassoul, 2018: A terrestrial gamma-ray flash inside the eyewall of Hurricane Patricia. *J. Geophys. Res.*, *123*, 4977-4987.
- Brammer, A., C.D. Thorncroft, and **J.P. Dunion**, 2018: Observations and predictability of a nondeveloping tropical disturbance over the eastern Atlantic. *Mon. Wea. Rev.*, *146*, 3079-3096.
- Christophersen, H., A. Aksoy, **J.P. Dunion**, and S. Aberson, 2018: Composite impact of Global Hawk unmanned aircraft dropwindsondes on tropical cyclone analyses and forecasts. *Mon. Wea. Rev.*, *146*, 2297-2314.

- Christophersen, H., R. Atlas, A. Aksoy, and J. Dunion, 2018: Combined use of satellite observations and Global Hawk unmanned aircraft dropwindsondes for improved tropical cyclone Analyses and Forecasts. *Wea. Forecasting*, **33**, 1021-1031, <https://doi.org/10.1175/WAF-D-17-0167.1>.
- **Dunion, J.P.**, G. Wick, P. Black, and J. Walker, 2018: Sensing Hazards with Operational Unmanned Technology: 2015–2016 Campaign Summary, Final Report. NOAA Tech Memo. OAR-UAS-001, 39 pp.
- Wick, G., **J. Dunion**, and J. Walker, 2018: Sensing Hazards with Operational Unmanned Technology: Impact Study of Global Hawk Unmanned Aircraft System Observations for Hurricane Forecasting, Final Report. NOAA Tech Memo. OAR-UAS-002, 93 pp.
- Dole, R.J., and Coauthors, 2018: Advancing science and services during the 2015-16 El Niño: the NOAA El Niño Rapid Response Field Campaign. *Bull. Amer. Meteor. Soc.*, **99**, 975-1001.
- Doyle, J.D., and Coauthors, 2017: A view of tropical cyclones from above: The Tropical Cyclone Intensity (TCI) Experiment. *Bull. Amer. Meteor. Soc.*, **98**, 2113-2134.
- Christophersen, H., A. Aksoy, **J.P. Dunion**, and K. Sellwood, 2017: The impact of NASA Global Hawk unmanned aircraft dropwindsonde observations on tropical cyclone track, intensity, and structure: case studies. *Mon. Wea. Rev.* **145**, 1817-1830.
- Abarca, S.F., M.T. Montgomery, S.A. Braun, and **J.P. Dunion**, 2016: On the secondary eyewall formation of Hurricane Edouard (2016), *Mon. Wea. Rev.* **144**, 3321-3331, <https://doi.org/10.1175/MWR-D-15-0421.1>.
- Folmer, M.J., R.W. Pasken, G. Chen, **J.P. Dunion**, and J. Halverson, 2016: Modeling studies on the formation of Hurricane Helene: the impact of GPS dropwindsondes from the NAMMA 2006 field campaign. *Meteor. Atmos. Phys.*, **128**, DOI 10.1007/s00703-016-0452-2.
- Kaplan, J., C.M. Rozoff, M. DeMaria, C.R. Sampson, J.P. Kossin, C.S. Velden, J.J. Cione, **J.P. Dunion**, J.A. Knaff, J.A. Zhang, J.F. Dostalek, J.D. Hawkins, T.F. Lee, J.E. Solbrig, 2015: Evaluating environmental impacts on tropical cyclone rapid intensification predictability utilizing statistical models. *Wea. Forecasting*, **30**, 1374–1396.
- **Dunion, J.P.**, C.D. Thorncroft, and C.S. Velden, 2014: The tropical cyclone diurnal cycle of mature hurricanes. *Mon. Wea. Rev.*, **142**, 3900-3919, <https://doi.org/10.1175/MWR-D-13-00191.1>.
- Rogers, R., S. Aberson, A. Aksoy, B. Annane, M. Black, J. Cione, N. Dorst, **J. Dunion**, J. Gamache, S. Goldenberg, S. Gopalakrishnan, J. Kaplan, B. Klotz, S. Lorsolo, F. Marks, S. Murillo, M. Powell, P. Reasor, K. Sellwood, E. Uhlhorn, T. Vukicevic, J. Zhang and X. Zhang, 2013: NOAA's Hurricane Intensity Forecasting Experiment (IFEX): A Progress Report. *Bull. Amer. Meteor. Soc.*, **94**, 859-882.
- Rennó, N.O., E. Williams, D. Rosenfeld, D.G. Fischer, J. Fischer, T. Kremic, A. Agrawal, M.O. Andreae, R. Bierbaum, R. Blakeslee, A. Boerner, N. Bowles, h. Christian, A. Cox1, **J. Dunion**, A. Horvath, X. Huang, A. Khain, S. Kinne, M.C. Lemos, J.E. Penner, U. Pösch, J. Quaas, E. Seran, B. Stevens, T. Walat, T. Wagner, 2013: CHASER: An innovative satellite mission concept to measure the effects of aerosols on clouds and climate. *Bull. Amer. Meteor. Soc.*, **94**, 685-694.
- Katzberg, S.J, **J.P. Dunion**, and G.G. Ganoe, 2013: The use of reflected GPS signals to retrieve ocean surface wind speeds in tropical cyclones. *Radio Sci.*, 48(4), 371-387.
- **Dunion, J.P.**, 2011: Re-Writing the Climatology of the Tropical North Atlantic and Caribbean Sea Atmosphere. *J. Climate*. **24**, 893-908.
- Katzberg S.J., and **J.P. Dunion**, 2009: Comparison of reflected GPS wind speed retrievals with dropsondes in tropical cyclones. *Geophys. Res. Lett.*, **36**, L17602, doi:10.1029/2009GL039512.
- Ismail, S., R.A. Ferrare, E.V. Browell, S.A. Kooi, **J.P. Dunion**, G. Heymsfield, A. Notari, C.F. Butler, S. Burton, M. Fenn, T.N. Krishnamurti, M. Biswas, G. Chen, and B. Anderson, 2010: LASE measurements of water vapor, aerosol, and cloud distributions in Saharan Air Layers and tropical disturbances. *J. Atmos. Sci.*, **67 no. 4**, 1026-1047.
- Zipser, E.J., C.H. Twohy, S. Tsay, K. L. Thornhill, S. Tanelli, R. Ross, T.N. Krishnamurti, Q. Ji, G. Jenkins, S. Ismail, N. C. Hsu, R. Hood, G. M. Heymsfield, A. Heymsfield, J. Halverson, H. M. Goodman, R. Ferrare, **J. P. Dunion**, M. Douglas, R. Cifelli1, G. Chen, E. V. Browell, and B. Anderson, 2009: The Saharan Air Layer and the fate of African easterly waves-NASA's AMMA 2006 field study of tropical cyclogenesis. *Bull. Amer. Meteor. Soc.*, **90**, 1137-1156.
- **Dunion, J.P.**, and C.S. Marron, 2008: A Reexamination of the Jordan mean tropical sounding based on

- awareness of the Saharan Air Layer: Results from 2002. *J. Climate*. **21**, 5242-5253.
- Westerink, J., R.A. Luetlich, J.C. Feyen, J.H. Atkinson, C. Dawson, H.J. Roberts, M.D. Powell, **J.P. Dunion**, E.J. Kubatko, and H. Pourtaheri, 2008: A Basin-to Channel-Scale Unstructured Grid Hurricane Storm Surge Model Applied to Southern Louisiana, *Mon. Wea. Rev.* **136**, 833-864.
 - Jones, T., D. Cecil, and **J.P. Dunion**, 2007: The environmental and inner core conditions governing the intensity of Hurricane Erin (2001). *Wea. Forecast.* **22**, 708-725.
 - Evan, A.T., **J.P. Dunion**, J.A. Foley, A.K. Heidinger, and C.S. Velden, 2006: New evidence for a relationship between Atlantic tropical cyclone activity and African dust outbreaks. *Geophys. Res. Lett.*, L19813, doi:10.1029/2006GL026408.
 - Rogers, R.F., S. Aberson, M. Black, P. Black, J. Cione, P. Dodge, **J.P. Dunion**, J. Gamache, J. Kaplan, M. Powell, J. Kaplan, M. Powell, N. Shay, N. Surgi, and E. Uhlhorn, 2006: The Intensity Forecasting Experiment: A NOAA multi-year field program for improving tropical cyclone intensity forecasts. *Bull. Amer. Meteor. Soc.* **87**, 1523-1537.
 - Aberson, Sim D., **J.P. Dunion**, F.D. Marks, 2006: A photograph of a wavenumber-2 asymmetry in the eye of Hurricane Erin. *J. Atmos. Sci.*, **63**, 387-391.
 - Velden, C.S., J. Daniels, D. Stettner, D. Santek, J. Key, J.P. Dunion, K. Holmlund, G. Dengel, W. Bresky, and W.P. Menzel, 2005: Recent innovations in deriving tropospheric winds from meteorological satellites. *Bull. Amer. Meteor. Soc.* **86**, 205-223.
 - Landsea, C.W., C. Anderson, N. Charles, G. Clark, **J.P. Dunion**, J. Fernandez-Partagas, P. Hungerford, C. Neumann, and M. Zimmer, 2004: The Atlantic Hurricane Database Reanalysis Project: Documentation for the 1851-1910 alterations and additions to the HURDAT Database. Columbia University Press, 462 pp.
 - Landsea, C.W., J.L. Franklin, C.J. McAdie, J.L. Beven III, J.M. Gross, B.R. Jarvinen, R.L. Pasch, E.N. Rappaport, **J.P. Dunion**, and P.P. Dodge, 2004: Reanalysis of Hurricane Andrew's intensity. *Bull. Amer. Meteor. Soc.* **85 no.11**, 1699-1712.
 - **Dunion, J.P.**, and C.S. Velden, 2004: The impact of the Saharan Air Layer on Atlantic tropical cyclone activity. *Bull. Amer. Meteor. Soc.*, **85 no. 3**, 353-365.
 - **Dunion, J.P.**, C.W. Landsea, S.H. Houston, and M.D. Powell, 2003: A Re-Analysis of the surface winds for Hurricane Donna of 1960. *Mon. Wea. Rev.*, **131**, 1992-2011.
 - Gedzelman, S., J. Lawrence, J. Gamache, M. Black, E. Hindman, R. Black, **J.P. Dunion**, H.E. Willoughby, X. Zhang, 2003: Probing hurricanes with stable isotopes of rain and water vapor. *Mon. Wea. Rev.*, **131**, 1112-1127.
 - **Dunion, J.P.**, and C.S. Velden, 2002: Application of surface adjusted GOES low-level cloud-drift winds in the environment of tropical cyclones. Part I: Methodology and Validation. *Mon. Wea. Rev.*, **130**, 1333-1346.
 - **Dunion, J.P.**, S.H. Houston, C.S. Velden, and M.P. Powell, 2002: Application of surface adjusted GOES low-level cloud-drift winds in the environment of tropical cyclones. Part II: Integration into surface wind analyses. *Mon. Wea. Rev.*, **130**, 1347-1355.

Professional Honors

- Co-Recipient: 2018 Banner I. Miller Award, American Meteorological Society: for their paper, "*The tropical cyclone diurnal cycle of mature hurricanes*, which identified a fundamental process in tropical cyclones and elegantly defined its properties and potential implications using observational data."
- Recipient: 2016 Best Paper Award, NOAA Atlantic Oceanographic and Meteorological Laboratory: Dunion et al. 2014, *The tropical cyclone diurnal cycle of mature hurricanes*.
- Recipient (2015): NASA Group Achievement Award for "outstanding achievements of the Hurricane and Severe Storms Sentinel (HS3) airborne mission to investigate the factors influencing hurricane intensity change".
- Co-Recipient (2015): American Meteorological Society Special Award to the University of Wisconsin-Madison/CIMSS Tropical Cyclone Group for "*providing the weather community with valuable tropical cyclone-related satellite information and derived products for over two decades.*"
- Co-Recipient (2010): NOAA AIRS Team for outstanding contributions to improving weather forecasting using data from the Atmospheric Infrared Sounder (AIRS)
- 2009 Editors' Citation for Excellence in Refereeing for Geophysical Research Letters
- 2005 NOAA David Johnson Award for "innovative research using environmental satellite observations on

the influence and impact of the Saharan Air Layer on Atlantic tropical cyclones and the role it plays in development, decay, and intensity change of these storms.”

- 2004 Editors’ Citation for Excellence in Refereeing for JGR-Atmospheres.
- Co-recipient: Best Transition to Operations Award, NOAA Tech 2002 Conference to the H*Wind team.
- Co-recipient: Best JAVA Implementation Award, NOAA Tech 2000 Conference for “A Distributed Real-Time Hurricane Wind Analysis System”.

Professional Service

- December 2020 – present: Member, NASA Convective Processes Experiment - Aerosols & Winds (CPEX-AW) science team
- November 2019 - present: Member, Office of Naval Research *Rapid Intensification in Tropical Cyclones* (TCRI) science team
- May 2019-present: Member, WMO Working Group on Tropical Meteorology Research (WGTMR)
- October 2017 – October 2020: Member, NASA Global Hydrology Resource Center (GHRC) User Working Group (UWG), Huntsville, AL
- April 2016: Co-Chair, 32nd Conference on Hurricanes and Tropical Meteorology, 17-22 April 2016, San Juan, Puerto Rico
- January 2014 - present: Member, NOAA Unmanned Aircraft Systems (UAS) Program’s *Sensing Hazards with Operational Unmanned Technology* (SHOUT) science team
- April 2014: Member, Organizing Committee, 31st Conference on Hurricanes and Tropical Meteorology, 30 March – 04 April 2014, San Diego, CA
- February 2014 - present: Member, Office of Naval Research *Tropical Cyclone Intensity* (TCI) science team
- April 2012 - present: Member, NASA *Hurricane and Severe Storm Sentinel* (HS3) science team
- April 2012: Member, Organizing Committee, 30th Conference on Hurricanes and Tropical Meteorology, 15-20 April 2012, Ponte Vedra Beach, FL
- August 2010: Lead forecaster, National Science Foundation PRE-Depression Investigation of Cloud-systems in the Tropics (PREDICT) field experiment (St. Croix, V.I.)
- June 2008 – December 2016: member, AMS Scientific and Technological Activities Commission (STAC) on Tropical Meteorology and Tropical Cyclones
- May 2006 - present: Host Researcher, *Monster Storms Project*, JASON/National Geographic
- May 2006 - present: member of the NASA NAMMA science and mission planning team
- May 2004: Smithsonian Scholar, Smithsonian Scholars in the Schools Program; Houston, TX
- May 2000 - present: Member of the American Meteorological Society
- May 2000 - Jan 2004: President of the Greater Miami Chapter of the American Meteorological Society
- Recipient: 1997-1998 Wisc. Space Grant Consortium Graduate Fellowship Award to integrate satellite winds into the NOAA Hurricane Research Division's tropical cyclone surface wind analysis system