

## **Heather M Holbach**

Florida State University Center for Ocean-Atmospheric Prediction Studies (COAPS)  
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### **Education**

#### **Doctor of Philosophy, Meteorology, December 2016**

Florida State University, Tallahassee, FL

Dissertation: “Wave and Wind Direction Effects on Ocean Surface Emissivity Measurements in High Wind Conditions”

Major Professor: Mark Bourassa

#### **Master of Science, Meteorology, August 2012**

Florida State University, Tallahassee, FL

Thesis: “The Effects of Gap-Wind-Induced Vorticity, the Monsoon Trough, and the ITCZ on Tropical Cyclogenesis”

Major Professor: Mark Bourassa

#### **Bachelor of Science, Meteorology, Magna Cum Laude, With Honors, May 2010**

Florida State University, Tallahassee, FL

Minors: Physics/Mathematics

### **Professional Experience**

Florida State University Center for Ocean Atmospheric Prediction Studies (COAPS), Northern Gulf Institute, & NOAA/AOML/Hurricane Research Division (HRD)

Position: Assistant in Research

Date: October 2018 – Present

Florida State University Center for Ocean Atmospheric Prediction Studies (COAPS), Northern Gulf Institute, & NOAA/AOML/Hurricane Research Division (HRD)

Position: Postdoctoral Scholar      Advisor: Dr. Frank Marks

Date: August 2016 – October 2018

Florida State University Center for Ocean Atmospheric Prediction Studies (COAPS)

Position: Graduate Research Assistant

Date: August 2010 – August 2016

Florida State University Center for Ocean Atmospheric Prediction Studies (COAPS)

Position: Researcher

Date: May 2010 – August 2010

### **Professional Activities and Expertise**

NOAA/AOML/HRD SFMR Expert      2018 – Present

Extensive experience also with dropsondes and various other aircraft data

AMS Committee on Air-Sea Interaction      2017 – Present (Vice Chair 2020 – present)

NOAA/AOML/HRD Hurricane Field Program      2013 – Present

Experiment Principal Investigator and onboard scientist support (lead project scientist, dropsonde processing, and radar scientist)

## **Related Experience**

### NOAA/AOML/Hurricane Research Division

Advisor: Dr. Eric Uhlhorn

Collected and analyzed Stepped Frequency Microwave Radiometer (SFMR) data for my dissertation research

Date: July – September 2013 and October – November 2014

### Naval Research Enterprise Intern Program (NREIP)

Advisor: Dr. Patricia Pauley

Naval Research Lab – Monterey, CA

“Assimilating HDOB Data in COAMPS® NAVDAS for Hurricane Earl”

Date: May – August 2011

### Honors in the Major

Advisor: Dr. Mark Bourassa

“Vorticity-based detection of tropical cyclogenesis in the Eastern Pacific Basin”

### Programming Languages

Python, IDL, Fortran, Matlab, GrADS

## **Honors, Awards, and Related Activities**

U.S. Department of Commerce Gold Medal: for courage, dedication, and heroism during the search and rescue efforts for the marine vessel *Bourbon Rhode* and crew on 27 and 28 September 2019 (group award, 2020)

AOML Andrew Award for Meritorious Service (2017)

Air-Sea Interaction Student Poster Competition 2<sup>nd</sup> place award

2015 AMS Annual Meeting Phoenix, AZ

Meteorology Graduate Student Representative

FSU Department of Earth, Ocean & Atmospheric Science

2014-2015 academic year

Chi Epsilon Pi Meteorology Honor Society

Vice President for 2012-2013 Chapter Year

Pi Mu Epsilon Mathematics Honor Society

Secretary/Treasurer for 2011-2012 Chapter Year

North Florida American Meteorological Society

Member of the Year for 2008-2009 Chapter Year

Treasurer for 2009-2010 Chapter Year

## **Student Advising**

Danny Wallace (FSU)	Fall 2021	Master's Thesis Committee Member
Justin Stow (FSU)	Spring 2020	Undergraduate Honors Thesis Committee Member
Sofia De Solo (ERAU)	Fall 2019	NOAA/AOML/HRD Internship Co-Advisor
Nicholas Johnson (UAH)	Summer 2019	NOAA Hollings Scholarship Internship Co-Advisor

## **Scientific Interests**

Tropical Meteorology

Remote Sensing

Air-Sea Interaction

## **Professional Membership**

American Meteorological Society  
American Geophysical Union

## **Peer-reviewed Journal Articles Published, In Press, and Submitted**

- Zawislak, J., R. F. Rogers, S. D. Aberson, G. Alaka, G. Alvey, A. Aksoy, L. Bucci, J. Cione, N. Dorst, J. Dunion, M. Fischer, J. Gamache, S. Gopalkrishnan, A. Hazelton, **H. M. Holbach**, J. Kaplan, H. Leighton, F. Marks, S. T. Murillo, P. Reasor, K. Ryan, K. Sellwood, J. Sippel, and J. Zhang, 2021: NOAA's Hurricane Intensity Forecasting Experiment: Accomplishments and Future Plans. *Bull. Amer. Meteor. Soc.*, in press.
- Stow, J. P., M. A. Bourassa, and **H. M. Holbach**, 2020: Analyzing Gaps in Hurricane Rain Coverage to Inform Future Satellite Proposals. *Remote Sens.*, **12**, 2673. Doi: 10.3390/rs12172673
- Bourassa, M. A., T. Meissner, I. Cerovecki, P. Chang, D. Xiaolong, G. De Chiara, C. Donlon, D. S. Dukhovskoy, J. Elya, A. Fore, M. R. Fewings, R. C. Foster, S. T. Gille, B. Haus, S. Histova-Veleva, **H. M. Holbach**, Z. Jelenak, J. Knaff, S. A. Kranz, A. Manaster, M. Mazloff, C. Mears, S. Mecklenburg, A. Mouche, M. Portabella, N. Reul, L. Ricciardulli, E. Rodriguez, C. Sampson, D. Solis, A. Stoffelen, M. Stukel, B. Styles, D. Weissman, and F. Wentz, 2019: Remotely Sensed Winds and Wind Stresses for Marine Forecasting and Ocean Modeling. *Front. Mar. Sci.*, **6**:443, doi: 10.3389/fmars.2019.00443
- Holbach, H. M.**, E. W. Uhlhorn, and M. A. Bourassa, 2018: Off-Nadir SFMR Brightness Temperature Measurements in High-Wind Conditions. *J. Atmos. Oceanic Technol.*, **35**, 1865–1879, https://doi.org/10.1175/JTECH-D-18-0005.1
- Holbach, H. M.**, and M. A. Bourassa, 2017: Platform and Across-Swath Comparison of Vorticity Spectra from QuikSCAT, ASCAT-A, OSCAT, and ASCAT-B Scatterometers. *IEEE J. Sel. Topics in Appl. Earth Observ. and Remote Sens.*, **10**, 2205–2213. doi: 10.1109/JSTARS.2016.2642583 [2 citations]
- Holbach, H. M.**, and M. A. Bourassa, 2014: The Effects of Gap-Wind-Induced Vorticity, the Monsoon Trough, and the ITCZ on East Pacific Tropical Cyclogenesis. *Mon. Wea. Rev.* **142**, 1312–1325. doi: <http://dx.doi.org/10.1175/MWR-D-13-00218.1> [15 citations]

## **Invited Presentations**

- Holbach, H.**, 2021: Observing Surface Wind and Waves in Tropical Cyclones with the NOAA Hurricane Hunters. *WHOI Physical Oceanography Seminar Series*, July, Virtual.
- Holbach, H.**, 2021: NOAA/AOML/HRD Hurricane Field Program. *SHORELINE21*, April, Virtual.
- Holbach, H.**, 2021: SFMR Re-calibration. *2021 AVAPS Users Group Meeting*, April, Virtual.
- Holbach, H.**, 2021: SFMR Algorithm Update. *2021 SFMR Workshop*, April, Virtual.
- Holbach, H.**, 2021: SFMR Recalibration Update. *2020 Postseason Aircraft Hotwash*, January, Virtual.

- Holbach, H.**, 2020: Improving Tropical Cyclone Observations and Forecasting with the NOAA Hurricane Hunters. *Notre Dame Environmental Fluid Dynamics Seminar Series*, October, Virtual.
- Holbach, H.**, 2020: Gulf of Mexico and Loop Current Research at NOAA AOML. *NAS GRP Webinar: Facing an Active 2020 Hurricane Season: Impacts of the Loop Current*, June, virtual.
- Holbach, H.**, 2020: SFMR Algorithm Status Update. *2019 Postseason Aircraft Hotwash*, January, Miami, FL.
- Holbach, H.**, 2019: SFMR: Present and Future. *2019 NOAA AOC/53rd Annual Conference*, November, Biloxi, Mississippi.
- Holbach, H.**, and J. Zawislak, 2019: The Challenges of Collecting, Maintaining, Archiving, and Accessing Hurricane Hunter Data at NOAA. *2019 ESIP Summer Meeting*, July, Tacoma, Washington.
- Holbach, H.**, 2018: Research Perspectives on the SFMR Algorithm. *Forum on SFMR Observations from Reconnaissance Aircraft Missions into Tropical Cyclones*, November, Miami, Florida.
- Klotz, B. **H. Holbach**, and A. Garcia, 2017: Reprocessing the Tropical Cyclone SFMR database: Procedures and Evaluation. *2017 International Ocean Vector Winds Science Team Meeting*, May, La Jolla, California.
- Bourassa, M. A., and **H. Holbach**. 2015: The effects of gap–wind–induced vorticity, the monsoon trough, and the ITCZ on tropical cyclogenesis. *Purdue University*, February, West Lafayette, Indiana.
- Bourassa, M. A., and **H. Holbach**, 2013: OSCAT vorticity consistency for use in gridded wind products. *Oceansat-2 International Announcement of Opportunity Science Meeting*, March, Ahmedabad, India.
- Bourassa, M. A., and **H. Holbach**, 2011: Differences between ASCAT, OSCAT and QuikSCAT derived vorticity. *IEEE Geophysical and Remote Sensing Society 2011*, July, Vancouver, Canada.
- Bourassa, M. A., and **H. Holbach**, 2011: OSCAT and IR-based early detection of tropical disturbances. *Oceansat-2 International Announcement of Opportunity Science Meeting*, March, Ahmedabad, India.

### **Other Presentations**

- Holbach, H. M.**, 2021: Operational SFMR Algorithm Update. *AMS 34<sup>th</sup> Conference on Hurricanes and Tropical Meteorology*, May, Virtual.
- Reasor, P. D., **H. M. Holbach**, and J. F. Gamache, 2021: Reduction of Airborne Tail-Doppler Radar Winds to the Surface. *AMS 34<sup>th</sup> Conference on Hurricanes and Tropical Meteorology*, May, Virtual.
- Stow, J. P., M. A. Bourassa, **H. M. Holbach**, and V. Misra, 2021: Analyzing Gaps and Hurricane Rain Coverage to Inform NASA Satellite Proposals. *AMS 34<sup>th</sup> Conference on Hurricanes and Tropical Meteorology*, May, Virtual.

- Wallace, D. E., M. A. Bourassa, and **H. M. Holbach**, 2021: An Analysis of the Near-surface Layer in Hurricanes Using Dropsondes. *AMS 34<sup>th</sup> Conference on Hurricanes and Tropical Meteorology*, May, Virtual.
- Holbach, H.**, 2021: SFMR Algorithm Update. *2021 International Ocean Vector Winds Science Team Meeting*, February, Virtual.
- Wallace, D., M. Bourassa, and **H. Holbach**, 2021: An Analysis of the Near-Surface Layer in Hurricanes Using Dropsondes. *2021 International Ocean Vector Winds Science Team Meeting*, February, Virtual.
- Stow, J. P., M. A. Bourassa, and **H. M. Holbach**, 2021: Analyzing Gaps in Hurricane Rain Coverage to Inform Future Satellite Proposals. *2021 International Ocean Vector Winds Science Team Meeting*, February, Virtual.
- Holbach, H.**, 2021: Improving Aircraft-based Surface Wind Speed Estimates in Tropical Cyclones. *22<sup>nd</sup> Conference on Air-Sea Interaction*, January, Virtual.
- Wallace, D., M. Bourassa, and **H. Holbach**, 2021: Analysis of the Near-Surface Layer in Hurricanes using Dropsondes. *22<sup>nd</sup> Conference on Air-Sea Interaction*, January, Virtual.
- Holbach, H.**, K. Ahern, R. Foster, and M. Bourassa, 2020: Dropsonde Atmospheric Surface Flux Estimates in Tropical Cyclones. *AGU Ocean Sciences Meeting 2020*, February, San Diego, California.
- Holbach, H.**, J. Zawislak, S. De Solo, and N. Johnson, 2019: Observing Tropical Cyclones from the Sky. *2019 AGU Fall Meeting*, December, San Francisco, California.
- Dunion, J., J. Zawislak, and **H. Holbach**, 2019: The Challenges of Collecting, Maintaining, Archiving, and Accessing Hurricane Hunter Data at NOAA. *2019 AGU Fall Meeting*, December, San Francisco, California.
- Holbach, H.**, 2019: Future Updates to the Operational SFMR Algorithm. *2019 International Ocean Vector Winds Science Team Meeting*, May, Portland, Maine.
- Holbach, H.**, I. PopStefanija, B. W. Klotz, and M. A. Bourassa, 2018: Surface Wind and Wave Interactions in Tropical Cyclones. *21<sup>st</sup> Conference on Air-Sea Interaction*. June, Oklahoma City, Oklahoma.
- Holbach, H.**, B. W. Klotz, and M. A. Bourassa, 2018: Rain Impact on SFMR Measurements. *2018 International Ocean Vector Winds Science Team Meeting*. April, Barcelona, Spain.
- Holbach, H.**, I. PopStefanija, B. W. Klotz, and M. A. Bourassa, 2018: Ocean Surface Wave Impacts on SFMR Measurements in Tropical Cyclones. *AMS 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology*, April, Ponte Vedra, Florida.
- Holbach, H.**, M. A. Bourassa, and B. W. Klotz, 2018: Harmonic Analysis of SFMR Off-Nadir Brightness Temperature Measurements in Tropical Cyclones. *AMS 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology*, April, Ponte Vedra, Florida.
- Klotz, B., D. Nolan, **H. Holbach**, E. Uhlhorn, M. Brennan, and R. Henning, 2018: Intense Surface and Flight Level Wind Speeds in Hurricanes: When Conventional Rules Breakdown. *AMS 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology*, April, Ponte Vedra, Florida.
- J. Zawislak, **H. Holbach**, B. W. Klotz, F. Marks, and S. Murillo, 2018: Preserving, Archiving, and Displaying Airborne Datasets at NOAA/AOML's Hurricane Research Division. *AMS 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology*, April, Ponte Vedra, Florida.

- J. J. Cione, **H. Holbach**, and Coauthors, 2018: Coyote UAS Observations in Hurricane Maria (2017). *AMS 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology*, April, Ponte Vedra, Florida.
- B. A. Dahl, **H. Holbach**, and Coauthors, 2018: Improving Coyote UAS Tropical Cyclone Sampling Strategies in an OSSE. *AMS 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology*, April, Ponte Vedra, Florida.
- R. Wiggins, **H. Holbach**, and Coauthors, 2018: Impact of Ensemble-Based Targeting for Coyote UAS Observations in an OSSE. *AMS 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology*, April, Ponte Vedra, Florida.
- A. Aksoy, **H. Holbach**, and Coauthors, 2018: A Data Impact Study Using Coyote UAS Observations in Hurricane Maria (2017). *AMS 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology*, April, Ponte Vedra, Florida.
- Holbach, H.**, M. A. Bourassa, and B. Klotz, 2016: Sea State Influence on SFMR Wind Speed Retrievals in Tropical Cyclones. *International Workshop on Measuring High Wind Speeds Over the Ocean*, November, Exeter, United Kingdom.
- Holbach, H.**, E. Uhlhorn, M. A. Bourassa, and B. Klotz, 2016: Wave and Wind Direction Effects on Ocean Surface Emissivity in High Wind Conditions. *AMS 20<sup>th</sup> Conference on Air-Sea Interaction*, August, Madison, Wisconsin.
- Holbach, H.**, E. Uhlhorn, and M. A. Bourassa, 2016: Wave and Wind Direction Effects on Ocean Surface Emissivity Measurements. *AMS 32<sup>nd</sup> Conference on Hurricanes and Tropical Meteorology*, April, San Juan, Puerto Rico.
- Holbach, H.**, E. Uhlhorn, and M. A. Bourassa, 2015: Wave and Wind Direction Effects on Ocean Surface Emissivity Measurements. *2015 International Ocean Vector Winds Science Team Meeting*, May, Portland, Oregon.
- Holbach, H.**, E. Uhlhorn, and M. A. Bourassa, 2015: Wave and Wind Direction Effects on SFMR Brightness Temperatures. *European Geosciences Union General Assembly 2015*, April, Vienna, Austria.
- Holbach, H.**, E. Uhlhorn, and M. A. Bourassa, 2015: Wave and Wind Direction Effects on SFMR Brightness Temperatures. *95<sup>th</sup> American Meteorological Society Annual Meeting*, January, Phoenix, Arizona.
- Holbach, H.**, E. Uhlhorn, and M. A. Bourassa, 2014: Wave and Wind Direction Effects on SFMR Brightness Temperatures. *2014 International Ocean Vector Winds Science Team Meeting*, June, Brest, France.
- Holbach, H.**, E. Uhlhorn, and M. A. Bourassa, 2014: Wave and Wind Direction Effects on SFMR Brightness Temperatures. *AMS 31<sup>st</sup> Conference on Hurricanes and Tropical Meteorology*, March, San Diego, California.
- Holbach, H.**, and M. A. Bourassa, 2013: Platform and Across Swath Comparison of Vorticity Spectra from QuikSCAT, ASCAT, and OSCAT Scatterometers. *IGARSS2013*, July, Melbourne, Australia.
- Holbach, H.**, and M. A. Bourassa, 2013: The Effects of Gap Wind Induced Vorticity, Monsoon Trough, the ITCZ, and ENSO on Tropical Cyclogenesis. *4<sup>th</sup> International Summit on Hurricanes and Climate Change*, June, Kos, Greece.

- Holbach, H.**, and M. A. Bourassa, 2013: Platform and Across Swath Comparison of Vorticity Spectra from QuikSCAT, ASCAT, and OSCAT Scatterometers. *2013 International Ocean Vector Winds Science Team Meeting*. May, Kailua-Kona, Hawaii.
- Holbach, H.**, and M. A. Bourassa, 2013: Platform and Across Swath Comparison of Vorticity Spectra from QuikSCAT, ASCAT, and OSCAT Scatterometers. *2013 EUMETSAT Meteorological Satellite Conference & 19th American Meteorological Society Satellite Meteorology, Oceanography, and Climatology Conference*. September, Vienna, Austria.
- Holbach, H.**, and M. A. Bourassa, 2012: The Effects of Gap Wind Induced Vorticity, Monsoon Trough, and the ITCZ on Tropical Cyclogenesis. *2012 IEEE International Geoscience and Remote Sensing Symposium*, July, Munich, Germany.
- Holbach, H.**, and M. A. Bourassa, 2012: The Effects of Gap Wind Induced Vorticity, the ITCZ, and Monsoon Trough on Tropical Cyclogenesis. *2012 International Ocean Vector Winds Science Team Meeting*, June, Utrecht, Netherlands.
- Bourassa, M. A., and **H. Holbach**, 2012: Resolving Vorticity in New Wind Products: Advantages of Finer Resolution and Improved Retrievals through Rain. *2012 International Ocean Vector Winds Science Team Meeting*, June, Utrecht, Netherlands.
- Holbach, H.**, and M. A. Bourassa, 2012: The effects of gap wind induced vorticity on tropical cyclogenesis. *AMS 30<sup>th</sup> Conferences on Hurricanes and Tropical Meteorology*, April, Ponte Vedra, Florida.
- Holbach, H.**, and M. A. Bourassa, 2011: The Effects of Gap Wind Induced Vorticity on Tropical Cyclogenesis. *AGU Fall Meeting 2011*, December, San Francisco, California
- Bourassa, M. A., and **H. Holbach**, 2011: Differences between ASCAT, OSCAT and QuikSCAT derived vorticity: implications on spatial resolution. *MTS/IEEE OCEANS'2011*, Sept., Kona, Hawaii.
- Holbach, H.**, and M. A. Bourassa, 2011: Comparison of scatterometer derived vorticity. *2011 International Ocean Vector Winds Science Team Meeting*, May, Annapolis, Maryland.
- Holbach, H.**, and M. A. Bourassa, 2011: Differences between ASCAT, OSCAT and QuikSCAT derived vorticity. *EUMETSAT/ESA Scatterometer Science Conference*, April, Darmstadt, Germany.

### **Reviewer for Refereed Journals**

Journal of Atmospheric and Oceanic Technology (1 in 2020)  
 Nature Geosciences (1 in 2020)  
 Marine Technology Society Journal (1 in 2018)  
 Deep Sea Research (1 in 2018)  
 Remote Sensing of Environment (1 in 2017)  
 Remote Sensing (1 in 2016)  
 Journal of Selected Topics in Applied Earth Observations and Remote Sensing (1 in 2016)

### **Guest Editor**

Remote Sensing – Special Issue “High Winds and High Seas” (2020–2021)