

Todd Austin Murphy

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EDUCATION

2015 **University of Alabama in Huntsville**, Huntsville, AL
Ph.D., Atmospheric Science
2010 **M.S.**, Atmospheric Science

2008 **University of South Alabama**, Mobile, AL
B.S., Meteorology

PROFESSIONAL EXPERIENCE

2017- **Dept. of Atmospheric Science, University of Louisiana at Monroe**, Monroe, LA
2014- Endowed Professor in Geosciences
Assistant Professor

2012-2014 **Dept. of Atmospheric Science, University of Alabama in Huntsville**, Huntsville, AL
Instructor
2008-2014 Graduate Research Assistant

2007-2008 **Dept. of Earth Sciences, University of South Alabama**, Mobile, AL
Teaching Assistant

GRANTS AND CONTRACTS

2016-18 Brown, M., **T.A. Murphy**, and R.A. Wade: *Understanding the Variability of Southeastern Severe Storm Environments using Mobile Soundings during VORTEX-SE*. NOAA: FY16 VORTEX-SE program. Collaborating institutions: Mississippi State University and University of Alabama in Huntsville. \$247,750 (\$83,800 ULM part) (extramural)

2016-17 **Murphy, T.A.**, and K.D. Leppert: *AWIPS-II Infrastructure Upgrade at the University of Louisiana at Monroe*. UCAR: 2016 Unidata Equipment Awards. \$17,904 (+ \$1,068 ULM match) (extramural)

2016-17 **Murphy, T.A.**, and K.D. Leppert: *Integrating Research and Education Through Continuous Atmospheric Temperature and Moisture Profiles*. Louisiana Board of Regents: Traditional Enhancement Program. \$139,500 (+ \$21,495 ULM match) (extramural)

2015-16 Brown, M., M.D. Parker, and **T.A. Murphy**: *Understanding the Variability and Predictability of Southeastern Severe Storm Environments using Mobile Soundings during VORTEX-SE*. NOAA: VORTEX-SE program. Collaborating institutions: Mississippi State University and North Carolina State University. \$227,038 (\$58,519 ULM part) (extramural)

2016 **Murphy, T.A.**, *The Weather Channel Guest Speaker*. ULM CAES: Salary Recovery Funds. \$950 (intramural)

- 2015 **Murphy, T.A.**, *Mobile Radar Truck Hands-On Exhibit & Seminar*. ULM CAES: Salary Recovery Funds. \$750 (intramural)
- 2015 **Murphy, T.A.**: *The University of Louisiana at Monroe's Polarimetric Doppler Weather Radar – Teaching, Research, and Operations*. ULM CAES: Dean's Faculty Support Fund for travel to present at 37th Conference on Radar Meteorology. \$832 (intramural)
- 2015 **Murphy, T.A.**: *ULM Synoptic Meteorology Teaching Laboratory Computer Update*. ULM CAES: Computer Refresh Funds (via proposal submitted to Salary Recovery Funds). \$3,700 (intramural)

PROPOSED (NOT FUNDED):

- 2017-19 **Murphy, T.A.**, R.A. Wade, and W. Terwey: *Understanding the Variability of Southeast Severe Environments in the Presence of Complex Terrain*. NOAA: FY17 VORTEX-SE program. Collaborating institutions: University of Alabama in Huntsville and University of South Alabama. \$295,004 (\$86,454 ULM part) (extramural)
- 2017-20 Buban, M.S., R. Dobosy, T.R. Lee, T. P. Meyers, and **T.A. Murphy**: *Collaborative Research for PREEVENTS Track 2: Using observations from the VORTEX-SE to improve predictions of tornado formation by identifying land surface forcings responsible for convection initiation and low-level vorticity enhancement*. NSF: Prediction of and Resilience against Extreme Events (PREEVENTS) program. Collaborating institutions: NOAA/ARL/ATDD and Oak Ridge Associated Universities. \$719,895 (\$90,746 ULM part) (extramural)
- 2015 Murillo, E., and **T.A. Murphy**: *Severity of Tornado Outbreaks in the Southeastern United States versus the Great Plains*. NSF/Louisiana Board of Regents (LA EPSCoR SURE). \$4,500 (extramural). *Scored 89% in reviewers; funding approval at 90%. Student led proposal.

PEER-REVIEWED PUBLICATIONS

- Murphy, T.A.**, R.A. Wade, and B.C. Carcione, 2016: Observations and operational considerations of the 4 June 2013 chaff event in north Alabama. *J. Operational Meteor.*, **4** (3), 34–45.
- Knupp K.R., **T.A. Murphy**, T.A. Coleman, R.A. Wade, S. Mullins, C.J. Schultz, E.V. Schultz, L. Carey, A. Sherrer, E.W. McCaul, B. Carcione, S. Latimer, A. Kula, K. Laws, P.T. Marsh, and K. Klockow, 2014: Meteorological overview of the devastating 27 April 2011 tornado outbreak. *Bull. Amer. Meteor. Soc.*, **95**, 1041–1062.
- Coleman, T.A., **T.A. Murphy**, K.R. Knupp, L.D. Carey, and M.E. Anderson, 2014: Extensive observations of the transition region of a winter storm. *J. Operational Meteor.*, **2** (1), 1–12.
- Murphy, T.A.**, and K.R. Knupp, 2012: An analysis of cold season supercell storms using the synthetic dual-Doppler technique. *Mon. Wea. Rev.*, **141**, 602–624.

OTHER FORMAL PUBLICATIONS

- Murphy, T.A.**, 2015: Interactions of wave-like reflectivity segments with deep convection and subsequent mesocyclogenesis and tornadogenesis. University of Alabama in Huntsville, 194 pp. (Ph.D. dissertation)
- Murphy, T.A.**, 2010: Super Tuesday storm variability. University of Alabama in Huntsville, 173 pp. (M.S. thesis)

CONFERENCE PROCEEDINGS

Annotations: *Student Author; +Presentation Award

- Murphy, T.A.**, T. Aydell*, I. Bordelon*, S. Kreller*, A. Melancon*, H.M. Mallinson*, and E.M. Murillo*, 2016: An Overview of ULM Participation in the VORTEX-SE Field Program. *28th Conference on Severe Local Storms*, Portland, OR, Amer. Meteor. Soc.
- *Lyza, A.W., **T.A. Murphy**, D.M. Conrad*, and K.R. Knupp, 2016: Environmental Evolution and Storm-Scale Observations of the 31 March 2016 Northern Alabama Tornado Event during VORTEX-SE. *28th Conference on Severe Local Storms*, Portland, OR, Amer. Meteor. Soc.
- *Mallinson, H.M., and **T.A. Murphy**, 2016: Comparing Environmental Conditions of Convective Storms Producing Damaging Winds and Hail. *LSU-S Student Scholars Forum*, Shreveport, LA, LSU-Shreveport.
- +*Murillo, E.M., and **T.A. Murphy**, 2016: Classification and Analysis of Tornado Outbreaks in Dixie Alley and Tornado Alley. *LSU-S Student Scholars Forum*, Shreveport, LA, LSU-Shreveport. **Awarded “Best Undergraduate Oral Presentation”**
- *Mallinson, H.M., and **T.A. Murphy**, 2016: Comparing Environmental Conditions of Convective Storms Producing Damaging Winds and Hail. *15th Annual American Meteorological Society Student Conference*, New Orleans, LA, Amer. Meteor. Soc., S99.
- *Murillo, E.M., and **T.A. Murphy**, 2016: Classification and Analysis of Tornado Outbreaks in Dixie Alley and Tornado Alley. *15th Annual American Meteorological Society Student Conference*, New Orleans, LA, Amer. Meteor. Soc., S87.
- *Lisauckis, C.A., K.R. Knupp, **T.A. Murphy**, T.A. Coleman, and A.W. Lyza*, 2016: Investigating Tornadogenesis Events within the ARMOR Domain. *15th Annual American Meteorological Society Student Conference*, New Orleans, LA, Amer. Meteor. Soc., S78.
- Murphy, T.A.**, A.T.C. Hanks, and E.A. Pani, 2015: The University of Louisiana at Monroe’s Polarimetric Doppler Radar – Teaching, Research, and Operations. *37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc.,
- *Lisauckis, C.A., K.R. Knupp, **T.A. Murphy**, and A.W. Lyza*, 2015: Storm Mode Variability over northern Alabama within the Domain of the ARMOR Radar. *37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc.,
- Wade, R., K. Knupp, D. Phillips, **T.A. Murphy**, A. Sherrer, A. Mayhew, A. Lyza*, and B. Freitag*, 2015: MIPS observations of the kinematic, thermodynamic, and microphysical characteristics of lake-effect snow bands during The Ontario Winter Lake-effect Systems (OWLeS) Field Project. *37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc.,
- *Lyza, A.W., **T.A. Murphy**, and K. Knupp, 2014: Overview of the 28-29 April 2014 Tennessee Valley Tornado Outbreak. *27th Conference on Severe Local Storms*, Madison, WI, Amer. Meteor. Soc., P120.
- Murphy, T.A.**, and K.R. Knupp, 2014: Prevalence and characteristics of atmospheric waves in severe weather environments. *94th American Meteorological Society Annual Meeting*, Atlanta, GA, Amer. Meteor. Soc., P837.
- Murphy, T.A.**, T.A. Coleman, and K.R. Knupp, 2013: Observations and analysis of atmospheric waves during the historic April 27, 2011 tornado outbreak. *38th National Weather Association Annual Meeting*, Charleston, SC, Nat. Wea. Assoc.
- Murphy, T.A.**, T.A. Coleman, and K.R. Knupp, 2013: Observations and analysis of atmospheric waves during the historic April 27, 2011 tornado outbreak. *36th Conference on Radar Meteorology*, Breckenridge, CO, Amer. Meteor. Soc., P258.

- Murphy, T.A.**, T.A. Coleman, and K.R. Knupp, 2013: Observations and analysis of atmospheric waves during the historic April 27, 2011 tornado outbreak. *11th Annual Southeast Severe Storms Symposium*, Starkville, MS, Mississippi State University.
- Murphy, T.A.**, T.A. Coleman, and K.R. Knupp, 2012: Observations and analysis of atmospheric waves during the historic April 27, 2011 tornado outbreak. *26th Conference on Severe Local Storms*, Nashville, TN, Amer. Meteor. Soc., P107.
- Murphy, T.A.**, R.A. Wade, T.A. Coleman, and K.R. Knupp, 2012: Analysis and recent observations of wave interactions in North Alabama. *9th Southeastern Coastal and Atmospheric Processes Symposium*, Mobile, AL, University of South Alabama.
- Murphy, T.A.**, R.A. Wade, T.A. Coleman, and K.R. Knupp, 2012: Analysis and recent observations of wave interactions in North Alabama. *10th Annual Southeast Severe Storms Symposium*, Starkville, MS, Mississippi State University.
- Murphy, T.A.**, T.A. Coleman, R.A. Wade, and K.R. Knupp, 2012: Radar overview and visual documentation of the 27 April 2011 tornadic outbreak. *92nd American Meteorological Society Annual Meeting*, New Orleans, LA, Amer. Meteor. Soc., J1.1.
- +Murphy, T.A.**, R.A. Wade, T.A. Coleman, and K.R. Knupp, 2011: Observations and operational importance of wave like features interacting with quasi-linear convective systems. *36th National Weather Association Annual Meeting*, Birmingham, AL, Nat. Wea. Assoc. **Awarded “Best Graduate Student Oral Presentation”**
- Murphy, T.A.**, T.A. Coleman, and K.R. Knupp, 2011: Preliminary observations of convective initiation and mesocyclone interactions with atmospheric waves on 27 April 2011. *36th National Weather Association Annual Meeting*, Birmingham, AL, Nat. Wea. Assoc.
- Murphy, T.A.**, R.A. Wade, T.A. Coleman, and K.R. Knupp, 2011: Observations of wave-like features interacting with a tornadic line-echo wave pattern. *35th Conference on Radar Meteorology*, Pittsburgh, PA, Amer. Meteor. Soc., 4B.6.
- Murphy, T. A.**, R.A. Wade, T.A. Coleman, and K.R. Knupp, 2011: Recent radar observations of wave-like features interacting with quasi-linear convective systems. *35th Conference on Radar Meteorology*, Pittsburgh, PA, Amer. Meteor. Soc., 191713.
- Murphy, T.A.**, and K.R. Knupp, 2010: Super Tuesday storm variability. *25th Conference on Severe Local Storms*, Denver, CO, Amer. Meteor. Soc., P8.20.
- Murphy, T.A.**, and K.R. Knupp, 2010: Super Tuesday storm variability. *7th Southeastern Coastal and Atmospheric Processes Symposium*, Mobile, AL, University of South Alabama.
- Murphy, T.A.**, and K.R. Knupp, 2009: Variability in the kinematic structure of Super Tuesday storms. *34th Conference on Radar Meteorology*, Williamsburg, VA, Amer. Meteor. Soc., 5B.2.
- Murphy, T.A.**, and M. Anderson, 2009: A North Alabama winter weather event: From a dual-pol perspective. *6th Southeastern Coastal and Atmospheric Processes Symposium*, Mobile, AL, University of South Alabama.

ADDITIONAL PRESENTATIONS

Invited presentations

- Mar. 2017 “ULM Radar Update,” NWS Shreveport Monroe SKYWARN Class
 Oct. 2016 “ULM Radar Update,” NWS Shreveport Monroe SKYWARN Class

Jun. 2016 “VORTEX-SE: Year 1 Review & Year 2 Preview,” Central Mississippi AMS/NWA Chapter
 Apr. 2016 “Tornado Climatology & the ULM Polarimetric Doppler Radar,” Louisiana Bankers Association
 Emergency Preparedness Meeting
 Jul. 2015 “ULM’s Polarimetric Doppler Weather Radar,” Southeast Texas/Southwest Louisiana AMS/NWA
 Chapter
 May 2015 “ULM’s Polarimetric Doppler Weather Radar,” Central Mississippi AMS/NWA Chapter
 Feb. 2015 “Atmospheric Gravity Waves,” Science Speaker Series, Louisiana School for Math, Science, and
 the Arts
 Apr. 2014 “Atmospheric Gravity Waves,” University of Louisiana at Monroe
 Mar. 2014 “Gravity Wave Interactions with Convection,” Nashville Severe Weather Awareness Day
 Mar. 2013 “April 27, 2011 Tornado Outbreak,” Nashville Severe Weather Awareness Day
 Jan. 2013 “April 27, 2011 Tornado Outbreak,” Middle Tennessee Chapter of the NWA
 Feb. 2012 “Doppler Radar and Polarimetric Analysis,” 3rd Annual Rocket City Weather Fest
 Sep. 2011 “April 27, 2011 Tornado Outbreak,” 2nd Annual Rocket City Weather Fest

TEACHING EXPERIENCE

*Annotations: *New course development by T. Murphy.*

University of Louisiana at Monroe

Earth Science (GEOS 1001)*: SU15, SU17
 Natural Disasters and Hazards (GEOS 1002)*: SU15, SU16, SU17
 Introduction to the Atmosphere (ATMS 1001): FA15, W16, SU17
 Introduction to Severe Weather (ATMS 1002): SP15, SU15, SP16, SU16, SP17, SU17
 Basic Meteorology Lab I (ATMS 1003): FA15
 Weather Analysis and Forecasting (ATMS 2000): FA14, FA15, FA16, FA17
 Dynamic Meteorology I (ATMS 3005): SP15
 Dynamic Meteorology II (ATMS 3006): FA14
 Intermediate Weather Forecasting (ATMS 3025)*: SP16, SP17
 Synoptic Meteorology Laboratory (ATMS 4003): FA14, FA15, FA16, FA17
 Mesoscale Meteorology (ATMS 4004): SP15, SP16, SP17
 Radar Meteorology (ATMS 4006)*: SP16

University of Alabama in Huntsville

Severe & Hazardous Weather (ATS/ESS 112): 2012–2014 *substitute instructor*
 Synoptic Meteorology (ATS/ESS 452): SP12, SP13
 Forecasting Mesoscale Processes (ATS 454/554): SP14
 Atmospheric Thermodynamics and Cloud Physics (ATS 541): 2012–2014 *substitute instructor*
 Ground Based Remote Sensing (ATS 671): 2012–2014 *substitute instructor*

University of South Alabama

Dynamic Meteorology I (MET 354): Fall 2007 *teaching assistant*
 Dynamic Meteorology II (MET 355): Spring 2008 *teaching assistant*
 Computer Applications in Meteorology (MET 420): Summer 2008 *teaching assistant*

LEADERSHIP, SERVICE, AND OUTREACH

University of Louisiana at Monroe

2017- UCAR Member Representative for ULM
 2016- Doctoral Committee Member, Tony Lyza, Dept. of Atmos. Science, Univ. Alabama in Huntsville
 2015- Faculty Advisor, ULM HAWCS (High Altitude Weather Collection with Soundings) balloon team
 2014- Webmaster, Department of Atmospheric Science
 2014- Faculty Advisor, ULM Student Chapter of the American Meteorological Society
 2014- Student Recruitment Coordinator, Department of Atmospheric Science
 2016-17 Member, Mathematics Faculty Search Committee
 2017 National Science Foundation (NSF), Major Research Instrumentation (MRI) Proposal Review Panel

June 2017 Co-Organizer and Presentation, ULM Radar Partners Meeting with NWS and GOHSEP
 Apr. 2017 Guest Seminar on Tornadoes & Weather Balloon Launch, Lee Junior High School
 Apr. 2017 Weather Balloon Launch, Louisiana Purchase Gardens & Zoo Easter Eggstravaganza
 Feb. 2017 Collaboration Visit, Louisiana Universities Marine Consortium
 Feb. 2017 Weather Balloon Launch, LearningTECH/Quest School
 2016 Member, College of Arts, Education, & Sciences Fundraising Committee
 Nov. 2016 Research participant and presentation, VORTEX-SE Workshop and Planning Meeting
 Sept. 2016 Interview (local TV), KNOE, Recent ATMS Grants
 June 2016 Weather Balloon Launch, Girls Power Up STEM Summer Camp
 Feb. 2016 Weather Balloon Launch, Jesus Good Shepherd School
 Feb. 2016 Interview (local TV), KNOE, Benefits of ULM Radar
 Feb. 2016 Interview (newspaper), The News Star, ULM participation in Vortex-SE
 Feb. 2016 Judge, LSU-S Student Scholars Forum
 2014-15 Member, School of Sciences Scholarship and Awards Committee
 2014-15 Member, Atmospheric Science Faculty Search Committee
 Nov. 2015 Interview (local TV), KTVE, ULM participation in Vortex-SE
 Nov. 2015 Interview (local TV), KNOE, ULM participation in Vortex-SE
 Nov. 2015 Research participant, VORTEX-SE Steering Workshop and Planning Meeting
 Oct. 2015 ULM ATMS representative, STEM Recruiting at St. Fredericks Catholic High School
 Oct. 2015 ULM representative, UCAR Members Meeting
 Sep. 2015 Interview (local radio), KEDM, Vortex-SE and ULM Radar
 Jul. 2015 Instructor, Bayou Discovery Camp
 May 2015 ULM representative, WiFi Committee, National Weather Service – Jackson, MS
 Feb. 2015 Research seminar & recruiting visit, Louisiana School for Math, Science, and the Arts
 Feb. 2015 Judge, Louisiana High School Technology Online Challenge

Undergraduate Researchers Supervised at the University of Louisiana at Monroe

Spring 2017 Taylor Aydell, Isaiah Bordelon, Brandon Cohen, Collin Landry, Alex Melancon, Sisam Shrestha, Nicholas Slaughter, and Sachin Thapa (VORTEX-SE field balloon team)
 Fall 2016 Taylor Aydell, ULM Emerging Scholars Program (\$500 internal grant)
 Fall 2016 Devorea McMillian, ULM Emerging Scholars Program (\$500 internal grant)
 Spring 2016 Taylor Aydell, Isaiah Bordelon, Stephen Kreller, Holly Mallinson, Alex Melancon, and Elisa Murillo (VORTEX-SE field balloon team)
 Spring 2016 John Dopieralla, ULM Emerging Scholars Program (\$500 internal grant)
 Spring 2016 Sisam Shrestha, ULM Emerging Scholars Program (\$500 internal grant)
 2015-16 Elisa Murillo, "Severity of Tornado Outbreaks in the Southeastern United States versus the Great Plains," *unfunded research project*
 2015-16 Holly Mallinson, "Characteristics of Damaging Wind Events," *unfunded research project*
 Fall 2015 Collin Landry, ULM Emerging Scholars Program (\$500 internal grant)
 Fall 2015 Cameron Dauterive, ULM Emerging Scholars Program (\$500 internal grant)

University of Alabama in Huntsville

2008-14 Public tour lead for UAH severe weather research vehicles
 Exhibit at 94th Annual AMS Meeting, Atlanta, GA (2014)
 STEM outreach event at Hampton Cover Middle School, Huntsville, AL (2013)
 AMS outreach event at Buckhorn High School, Huntsville, AL (2013)
 41st Conference on Broadcast Meteorology, Nashville, TN (2013)
 11th Annual Southeast Severe Storms Symposium, Starkville, MS (2013)
 9th Southeastern Coastal and Atmospheric Processes Symposium, Mobile, AL (2012)
 3rd Rocket City Weather Fest, Huntsville, AL (2012)
 2nd Rocket City Weather Fest, Huntsville, AL (2011)
 Various elementary, middle, and high school groups (2008-14)
 2011-12 Graduate Student Representative, Department of Atmospheric Science
 2011-12 Lead graduate student for new student recruiting, Department of Atmospheric Science
 2011, 12 Planning committee and volunteer, Rocket City Weather Fest

2011 National Weather Service Emergency Response Meteorologist (ER-MET) (assisted in tornado track surveys after 27 April 2011 outbreak)

Undergraduate Researchers Supervised at the University of Alabama in Huntsville

2014 Chris Lisauckis, “A Climatology of Wave-like Reflectivity Segments,” senior capstone project
2013 Elizabeth Lawson, “Synoptic Analysis of the 27 April 2011 Tornado Outbreak,” senior capstone project

ADDITIONAL RESEARCH OR PROFESSIONAL ACTIVITIES _____

2014- Science-PI, ULM polarimetric S-band Doppler weather radar
2011- Member, National Weather Association
2008- Member, American Meteorological Society

Research Field Deployments

2016-17 Verification of the Origins of Rotation in Tornadoes Experiment – Southeast (VORTEX-SE)
2013-14 Ontario Winter Lake-effect Systems (OWLLeS)
2011-13 Atmospheric Boundary Identification and Delineation Experiment III (ABIDE-III)
2008-12 UAH Tornadoes & Hurricanes, Observations, & Research (THOR)

Radar analysis experience (single and multi-Doppler) using the following software: SOLOII, SOLO3, NCAR RadX, REORDER, CEDRIC, GRLevel2 Analyst, Py-ART

Data analysis and visualization using the following software: IDL, NCL, Python, PV-Wave, Fortran

Experience operating and troubleshooting the following research instruments: S-, C-, and X-band polarimetric Doppler radars, Doppler wind profilers, microwave profiling radiometers, lidar ceilometers, Doppler wind lidars, parsivel disdrometers, electric field mills, hotplate precipitation sensors, high-resolution time-lapse weather camera, iMet mobile sounding system

Actively manage the following research instruments at ULM: S-band polarimetric Doppler radar, Radiometrics 35-channel microwave radiometer, two iMet mobile sounding systems, OTT PARSIVEL disdrometer

AWARDS AND HONORS _____

2011 Graduate Research Assistant of the Year, University of Alabama in Huntsville
2011 Best Graduate Student Oral Presentation, 36th Annual National Weather Association Meeting
2007 Dr. Bill Williams Endowment Scholarship, University of South Alabama