ANNA MARIA WILSON, Ph.D.

Scripps Institution of Oceanography, University of California San Diego
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EDUCATION

2016 Ph.D. in Hydrology and Fluid Dynamics
Department of Civil and Environmental Engineering, Duke University

2009 B.S. in Atmospheric Sciences, Mathematics Minor
University of North Carolina at Asheville, *Summa Cum Laude*

GRANTS AND RESEARCH AWARDS

2019-2021 NOAA Office of Weather and Air Quality Research, Co-PI, Project Title: *Enhancing observations of melting level to support forecasts of rain-snow partitioning in the Sierra Nevada,* $301,408.

2017-2019 NOAA Office of Weather and Air Quality Research, Co-PI, Project Title: *Quantifying observational requirements for WRF-Hydro forcing in the west using Russian River HMT experience and data to inform National Water Center tools,* $299,883.

AWARDS

2016 Outstanding Scholar Award, Pratt School of Engineering, Duke University

2015 Professor Senol Utku Award, Duke University
- Annual award for best pre-Ph.D. peer-reviewed journal papers
- Awarded for Wilson and Barros, 2014

2014 National Science Foundation Travel Award to attend the 2014 Weather Radar and Hydrology International Symposium

2012-2015 National Science Foundation Graduate Research Fellowship Program (GRFP) Fellowship

2010 Pratt-Gardner Fellowship, Duke University

2010-2014 James B. Duke Fellowship, Duke University

2009 Award for Academic Excellence, University of North Carolina at Asheville

RESEARCH AND PROFESSIONAL EXPERIENCE

2018-present **University of California, San Diego.** *Field Research Manager*. Scripps Institution of Oceanography, Center for Western Water and Weather Extremes, San Diego, CA.
- Coordinate and lead all facets of CW3E's field efforts at locations around the world, including airborne reconnaissance
- Identify research priorities and develop field proposals to support program objectives
- Coordinate and assemble materials for grant submissions
- Author and co-author scientific publications using observational data in peer-review journals

2016-2018 **University of California, San Diego.** *Postdoctoral Scholar*. Scripps Institution of Oceanography, Center for Western Water and Weather Extremes, San Diego, CA.
- Lead scientist for Task 4 of FIRO campaign – Advance the science of atmospheric rivers
- Leader of process studies group for West-WRF modeling at CW3E
- Mentor PhD students and undergraduates at UC San Diego

- Co-manage field campaign in the Russian River Basin in northern California, including radiosonde systems, radars, disdrometers, and rain gauges

2010-2016 **Duke University.** *Research Assistant*. Pratt School of Engineering, Durham, NC.

- Led and organized fieldwork tasks including maintenance of rain gauge networks, and deployments of MicroRain Radars and optical disdrometers
- Conducted numerous studies of precipitation microphysical and dynamical processes in complex terrain (western North Carolina) using: an explicit rainshaft model of drop size distribution evolution; analysis of in situ and remotely sensed observations; other modeling and analysis tools such as ARW-WRF and HYSPLIT
- Improved the functionality of the explicit rainshaft model to include the presence of additional low level moisture, in order to more accurately understand the effect of low level cloud and fog on precipitation events in the region
- Conducted sensitivity studies on microphysics and boundary layer schemes in ARW-WRF

2009-2010 **STG, Inc.** *Meteorological Precipitation Analyst*. National Climatic Data Center, Asheville, NC.

- Worked with a team on updating the Hourly Precipitation Dataset
- Developed skills with Linux servers, programming in Fortran and IDL

2009 **National Environmental Modeling and Analysis Center**. *GIS Intern*. National Climatic Data Center, Asheville, NC.

- Worked with a mentor to develop a quality-controlled snowstorm database in GIS
- Developed skills in GIS, presented work at an NCDC seminar and at UNC Asheville

PEER REVIEWED PUBLICATIONS

Hatchett, B.J., Q. Cao, P. Dawson, C.J. Ellis, C. Hecht, B. Kawzenuk, T. Osborne, J. Lancaster, **A.M. Wilson**, M. Anderson, M. Dettinger, J. Kalansky, M. Kaplan, D. Lettenmaier, N. Oakley, F.M. Ralph, D. Reynolds, A.B. White, M. Sierks, and E. Sumargo, 2020: Observations of an extreme atmospheric river storm with a diverse sensor network. *Earth and Space Sciences*, **6**, e2020EA001129, **https://doi.org/10.1029/2020EA001129.**

Lawrimore, J.H., D. Wuertz, **A. Wilson**, S. Stevens, M. Menne, B. Korzeniewski, M.A. Palecki, R.D. Leeper, and T. Trunk, 2020: Quality control and processing of Cooperative Observer Program Hourly Precipitation Data. *J. Hydrometeor.*, **https://doi.org/10.1175/JHM-D-19-0300.1.**

Ralph, F.M., F. Cannon, V. Tallapragada, C.A. Davis, J.D. Doyle, F. Pappenberger, A. Subramanian, **A.M. Wilson**, D.A. Lavers, C.A. Reynolds, J.S. Haase, L. Centurioni, J.J. Rutz, J.M. Cordeira, M. Zheng, C.W. Hecht, B. Kawzenuk, and L. Delle Monache, 2020: West coast forecast challenges and development of atmospheric river reconnaissance. *Bull. Amer. Meteor. Soc.*, **https://doi.org/10.1175/BAMS-D-19-0183.1.**

Sumargo, E., **A.M. Wilson**, F.M. Ralph, R. Weihs, A. White, J. Jasperse, M.A. Lamjiri, S. Turnbull, C. Downer, and L. Delle-Monache, 2020: The hydrometeorological observation network in California's Russian River Watershed: Development, characteristics, and key findings from 1997-2019. *Bull. Amer. Meteor. Soc.*, **https://doi.org/10.1175/BAMS-D-19-0253.1.**

Wilson, A.M., W. Chapman, A.E. Payne, A.M. Ramos, C. Boehm, D. Campos, J. Cordeira, R. Garreaud, I.V. Gorodetskaya, J.J. Rutz, C. Viceto, and F.M. Ralph, 2020: Training the next generation of researchers in the science and application of atmospheric rivers. *Bull. Amer. Meteor. Soc.*, **101(6)**, E738-E743, **doi:10.1175/BAMS-D-19-0311.1.**

Fish, M.A., **A.M. Wilson**, and F.M. Ralph, 2019: Atmospheric river families: definition and associated synoptic conditions. *J. Hydrometeor.*, **20**, 2091-2108, **https://doi.org/10.1175/JHM-D-18-0217.1.**

Martin, A.C., F.M. Ralph, **A.M. Wilson**, L. DeHaan, and B. Kawzenuk, 2019: Rapid cyclogenesis from a mesoscale frontal wave on an atmospheric river: impacts on forecast skill and predictability during

atmospheric river landfall. *J. Hydrometeor.,* **20**, 1779-1794, **https://doi.org/10.1175/JHM-D-18-0239.1.**

Ralph, F.M., **A.M. Wilson**, T. Shulgina, B. Kawzenuk, S. Sellars, J.J. Rutz, M.A. Lamjiri, E.A. Barnes, A. Gershunov, B. Guan, K. Nardi, T. Osborne, and G.A. Wick, 2019: ARTMIP-Early start comparison of atmospheric river detection tools: How many atmospheric rivers hit northern California's Russian River Watershed? *Clim. Dyn.*, **52**, 4973-4994.

Ramos, A.M., **A.M. Wilson**, M.J. DeFlorio, M.D. Warner, E.A. Barnes, R. Garreaud, I.V. Gorodetskaya, D.A. Lavers, B. Moore, A. Payne, C. Smallcomb, H. Sodemann, M. Wehner, and F.M. Ralph, 2019: 2018 International Atmospheric Rivers Conference: Multidisciplinary studies and high-impact applications of atmospheric rivers. *Atmos. Sci. Lett.,* **e935, https://doi.org/10.1002/asl.935**.

Rutz, J.J., C.A. Shields, J.M. Lora, A.E. Payne, B. Guan, P. Ullrich, T. O'Brien, L.R. Leung, F.M. Ralph, M. Wehner, S. Brands, A. Collow, A. Gershunov, N. Goldenson, I. Gorodetskaya, H. Griffith, S. Hagos, K. Kashinath, B. Kawzenuk, H. Krishnan, D. Lavers, G. Magnusdottir, K. Mahoney, G. Muszynski, P.D. Nguyen, M. Prabhat, A.M. Ramos, S. Sellars, R. Tome, D. Waliser, D. Walton, G. Wick, **A.M. Wilson**, M. Viale, 2019: The Atmospheric River Tracking Method Intercomparison Project (ARTMIP): Quantifying uncertainties in atmospheric river climatology. *J. Geophys. Res.: Atmospheres*, **124**, 13777-13802, **doi: 10.1029/2019JD030936.**

Vano, J.A., M.D. Dettinger, R. Cifelli, D. Curtis, A. Dufour, K. Miller, J.R. Olsen, and **A.M. Wilson**, 2019: Hydroclimatic extremes as challenges for the water management community: Lessons from Oroville Dam and Hurricane Harvey [in "Explaining Extreme Events of 2017 from a Climate Perspective"]. *Bull. Amer. Meteor. Soc.*, **100(1)**, S9-S14.

Shields, C.A., J.J. Rutz, L.-Y. Leung, F.M. Ralph, M. Wehner, B. Kawzenuk, J.M. Lora, E. McClenny, T. Osborne, A.E. Payne, P. Ullrich, A. Gershunov, N. Goldenson, B. Guan, Y. Qian, A.M. Ramos, C. Sarangi, S. Sellars, I. Gorodetskaya, K. Kashinath, V. Kurlin, K. Mahoney, G. Muszynski, R. Pierce, A.C. Subramanian, R. Tome, D. Waliser, D. Walton, G. Wick, **A.M. Wilson**, D. Lavers, Prabhat, A. Collow, H. Krishnan, G. Magnusdottir, and P. Nguyen, 2018: Atmospheric River Tracking Method Intercomparison Project (ARTMIP): Project goals and experimental design. *Geosci. Model Dev.*, **11**, 2455-2474.

Cannon, F., F.M. Ralph, **A.M. Wilson,** and D.P. Lettenmaier, 2017: GPM Satellite Radar Measurements of Precipitation and Freezing Level in Atmospheric Rivers: Comparison with Ground-Based Radars and Reanalyses. *J. Geophys. Res.: Atmospheres*, **122**, 12747-12764.

Wilson, A.M., and A.P. Barros, 2017: Orographic land-atmosphere interactions and the diurnal cycle of low level clouds and fog. *J. Hydrometeor.*, **18**, 1513-1533.

Wilson, A.M., and A.P. Barros, 2015: Landform controls on low level moisture convergence and the diurnal cycle of warm season orographic rainfall in the Southern Appalachians. *J. Hydrol.*, **531**, 475-493.

Duan, Y., **A.M. Wilson**, and A.P. Barros, 2015: Scoping a field experiment: error diagnostics of TRMM precipitation radar estimates in complex terrain as a basis for IPHEX2014. *Hydrol. Earth Syst. Sci.*, **11**, 11137-11182.

Wilson, A.M., and A.P. Barros, 2014: An investigation of warm rainfall microphysics in the Southern Appalachians: orographic enhancement via low-level seeder-feeder interactions. *J. Atmos. Sci.,* **71**, 1783-1805.

Williams, C.R., V.N. Bringi, L. Carey, V. Chandrasekar, P. Gatlin, Z.S. Haddad, S.J. Munchak, W.A. Petersen, R. Meneghini, S.W. Nesbitt, S. Tanelli, A. Tokay, **A. Wilson**, and D. Wolff, 2014: Describing the shape of raindrop size distributions using uncorrelated raindrop mass spectrum parameters. *J. Appl. Meteor. Climatol.,* **53**, 1282-1296.

PROCEEDING PUBLICATIONS

F.M. Ralph, J. Jasperse, C.A. Talbot, and **A.M. Wilson**, 2019. Forecast informed reservoir operations: Developing best practices for enhancing use of existing water management infrastructure. *SEDHYD2019*, Reno, NV, US Army Corps of Engineers.

Wilson, A., S. Hinson, D. Manns, R. Ray and J.H. Lawrimore, 2010. Hourly precipitation data processing changes at NCDC. *15th Symposium on Meteorological Observation and Instrumentation*, Atlanta, GA, American Meteorological Society, 8.3.

INVITED TALKS

2019 **Wilson, A.M.** Rivers in the Sky – Why I Study the Earth's Atmospheric Processes. *American Geophysical Union Fall Meeting*, San Francisco, CA, 13 December.

2019 **Wilson, A.M.** Exploring Novel Strategies to Enhance Use of Existing Water Management Infrastructure: Collecting Unique Observations with Local Partners. *American Geophysical Union Fall Meeting*, San Francisco, CA, 11 December.

2018 **Wilson, A.M.**, and F.M. Ralph. Forecast informed reservoir operations: Background, and supporting forecast improvements through atmospheric data collection and numerical modeling. *Governor's Conference on the Future of Water in Kansas*, Manhattan, KS, 14 November.

2018 **Wilson, A.M.**, and F.M. Ralph. Research on atmospheric rivers and resulting watershed impacts in the Russian River Basin and West Coast. *Russian River Science Forum*, Sonoma County Water Agency, Santa Rosa, CA, 1 May.

2014 **Wilson, A.M.** An investigation into the effect of low level cloud and fog on the precipitation regime in the Southern Appalachians. *EcoLunch Seminar Series*, Wake Forest University, Winston-Salem, NC, 19 March.

FIELD EXPERIENCE

2019-present Forecast-Informed Reservoir Operations Field Campaign. Yuba, Feather, and Santa Ana Basins
- Instruments: Radiosondes, MicroRain Radars, Optical Disdrometers, Rain Gauges, Soil Moisture, Level Loggers**,** ISCO samplers

2018-present Coordinator for Atmospheric River Reconnaissance. North Pacific Ocean.
- Instruments: Dropsondes

2016-present Forecast-Informed Reservoir Operations Field Campaign. Russian River Basin, Sonoma and Mendocino Counties, CA.
- Instruments: Radiosondes, MicroRain Radars, Optical Disdrometers, Rain Gauges, Soil Moisture, Level Loggers

2007-2016 Precipitation Measurement Mission (PMM) Great Smoky Mountains Network. Pigeon River Basin, Haywood County, NC.
- Instruments: Flux Tower, MicroRain Radars, Optical Disdrometers, Rain Gauges

2015 Andes Biodiversity and Ecosystem Research Group. Madre de Dios Basin, Peru.
- Instruments: Rain Gauges, Weather Stations

2013-2014 Integrated Precipitation and Hydrology Experiment. Asheville, NC.
- Instruments: MicroRain Radars, Optical Disdrometers, Rain Gauges, Particle Counters

2011-2012 Global Cold-Season Precipitation Experiment. Egbert, ON, Canada.
- Instruments: L-band and acoustic snow sensors

2011 Midlatitude Continental Convective Cloud Experiment. Ponca City, OK.
- Instruments: Rain Gauges, Optical and 2 Dimensional Video Disdrometers

PROFESSIONAL MEMBERSHIPS

2007 – present	American Meteorological Society (AMS)
2011 – present	American Geophysical Union (AGU)
2011 – present	Earth Science Women's Network (ESWN)
2013 – present	Geological Society of America (GSA)
2013 – present	American Society of Civil Engineers (ASCE)
2019 – present	Sigma Xi Associate Member
2020 – present	Association for Women in Science Junior Member

TEACHING AND MENTORING

2019 Mentor, Scripps Undergraduate Research Fellowship Program. Scripps Institution of Oceanography. La Jolla, CA.

- Ketzel Levens (University of Wisconsin, Madison) – atmospheric river dynamics as observed by radiosondes and dropsondes, West Coast vs. Midwest US., fieldwork maintaining sensors in the Russian River basin

2019 Instructor – AR Colloquium Summer School. La Jolla, CA.

2016 Mentor – UCSD California Louis Stokes Alliance for Minority Participation in Science, Engineering & Mathematics Summer Research Program. San Diego, CA.

2010 – 2016 Elementary and Middle School Tutor for the Refugee Resettlement Committee at the Congregation for Duke University Chapel. Durham, NC.

2015 Women and Mathematics Math Mentoring Program. Durham, NC Public Schools.

2012 – 2013 Teaching Assistant, Mechanics of Solids Course. Duke University. Durham, NC.

2011 - 2014 Mentor, Research Experience for Undergraduates. Duke University. Durham, NC.

- Kevin Olson (Georgia Tech) – satellite remote sensing, deployment of new temperature and relative humidity sensors in the PMM network, data analysis
- Daniel Moraff (Brown University) – statistical and spectral analysis of precipitation data, maintenance of PMM network
- Zarif Gani (Vanderbilt University) – development of a new fog collector, data analysis, maintenance of PMM network
- Lauren Weston (Smith College) – maintenance and deployment of mobile observing platform, precipitation microphysics, statistical analysis

PROFESSIONAL SERVICE AND OUTREACH

2020 – present	Global Hydrology Resource Center User Working Group, NASA.
2019	AR Colloquium Summer School Steering Committee Member
2018 - present	International Atmospheric Rivers Conference Steering Committee Member
2018 – present	Yampa Basin Rendezvous Steering Committee Member
2017	Session Convener and Chair, *Science to Action: Resilient Decision Making in the Midst of Uncertainty*, American Geophysical Union Fall Meeting, New Orleans, LA.
2017	Session Co-Chair, *Atmospheric Rivers*, American Meteorological Society 17th Conference on Mesoscale Processes, San Diego, CA.
2016 – present	Water Resources Committee Member, American Meteorological Society.
2012 – present	Peer reviewer for multiple journals including *J. Hydrol., J. Hydrometeor., Atmosphere, Remote Sensing, J. Geophys. Res.-Atmos., Water, Water Res. Research, Hydrol. Sciences Journal, Meteor. Atmos. Phys., Climate Res.*

2010 – 2016	National Academy of Engineers Grand Challenge K-12 Partners Program at Duke University**.** Durham, NC.
2011 – 2016	Drop Size Distribution Working Group, Global Precipitation Mission, NASA.
2012 – 2016	Water Resources Committee Student Member, American Meteorological Society.
2014 – 2016	Project Lead-the-Way Advisory Board Member, East Chapel Hill High School.
2016	Central North Carolina (Region 3A) K-12 Science and Engineering Fair Judge
2015 - 2016	FEMMES (Females Excelling More in Math, Engineering, and Science) Capstone Event Volunteer
2011 - 2012	Project Lead-the-Way at Duke University**.** Durham, NC.