

## CURRICULUM VITAE

### **Elizabeth J. Thompson**

Senior Meteorologist  
Applied Physics Laboratory  
University of Washington  
Air-Sea Interaction and Remote Sensing Department  
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### **Research Interests**

Air-sea fluxes and their role in the co-evolution of atmospheric and oceanic boundary layers; Studies of meteorology, precipitation, and clouds using observations from dual- and single-polarization radars for clouds and rain, satellites, and disdrometers; Algorithms for quantitative precipitation estimation and precipitation classification; Investigations of meteorological and physical oceanographic processes with satellite and in-situ observations; Observation-based research on atmospheric dynamics as well as synoptic-scale and mesoscale meteorology; Use of in-situ measurements to improve prediction models and remote sensing products.

### **Education**

- 2012-2016 Ph.D. Atmospheric Science, Colorado State University  
Advisor: Steven A. Rutledge; co-advisor: James N. Moum (Oregon State Univ.)  
Dissertation: "*Tropical warm pool rainfall variability and impact on upper ocean variability throughout the Madden-Julian Oscillation*"
- 2010-2012 M.S. Atmospheric Science, Colorado State University  
Advisor: Steven A. Rutledge  
Thesis: "*Development of a Polarimetric-Radar Based Hydrometeor Classification Algorithm for Winter Precipitation*"
- 2006-2010 B.S. Meteorology, minors in Mathematics and Geography, Valparaiso University  
Advisor: Bart Wolf

### **Professional Experience**

- 2018-present Senior Meteorologist, Applied Physics Laboratory at Univ. of Washington, Air-Sea Interaction and Remote Sensing Dept.
- 2016-2018 Postdoctoral Research Associate, Applied Physics Laboratory at Univ. of Washington, Air-Sea Interaction and Remote Sensing Dept. Mentors: Kyla Drushka, William E. Asher, Andrew T. Jessup

- 2010-2016 Graduate Research Assistant, Colorado State Univ., Radar Meteorology Group, Advisor: Steven A. Rutledge
- 2014 Graduate Teaching Assistant, Atmospheric Thermodynamics and Cloud Physics, Supervisor: Prof. Steven A. Rutledge, Colorado State Univ.
- 2011-2012 Graduate Student Representative, Colorado State Univ.
- 2010 Environmental Science Interpretation and Visitor Services Assistant, U.S. Forest Service, Chugach National Forest, Glacier Ranger District, Alaska. Mentor: Lezlie Murray
- 2009-2010 Undergraduate Teaching Assistant, Atmospheric Dynamics, Supervisor: Prof. Teresa Bals-Elsholz, Valparaiso Univ.
- 2009 Undergraduate Research Assistant. NOAA OAR National Severe Storms Lab, Mentor: Kenneth Howard
- 2008 Student Volunteer, NOAA National Weather Service Weather Forecast Office Baltimore/Washington D.C., Mentor: Steven Zubrick
- 2007 Undergraduate Research Assistant, NASA/Texas Commission for Environmental Quality and Valparaiso Univ. Tropospheric Ozone Pollution Project, Mentor: Gary Morris

## **Field Experiments**

- 2018 Propagation of Intra-Seasonal Tropical Oscillations (PISTON), Sept 14 – Oct 15, role: collected ship-based oceanographic and rain measurements, analyzed observations of air-sea fluxes, upper ocean properties, surface meteorological properties, clouds, and rain, R/V Thomas G. Thompson, Chief Scientist: James N. Moum (OSU)
- 2017 Salinity Processes in the Upper Ocean Regional Study 2 (SPURS-2), Oct 16 – Nov 17, role: collected and analyzed ship-based observations of the upper ocean and lower atmosphere, including radar-based rainfall; also analyzed air-sea fluxes, R/V Roger Revelle, Chief Scientist: Kyla Drushka (APL-UW)
- 2017 UNOLS Chief Scientist Training Cruise: Diurnal Warm Layers in the Great Lakes, June 8 -11, role: collected and analyzed upper ocean and meteorological observations, R/V Blue Heron, co-Chief Scientist: Elizabeth J. Thompson (APL-UW)
- 2016 Salinity Processes in the Upper Ocean Regional Study 2 (SPURS-2), Aug 13 – Sept 23, role: collected and analyzed ship-based observations of the upper ocean and lower atmosphere, including radar-based rainfall; also analyzed air-sea fluxes, R/V Roger Revelle, Chief Scientist: Andrew T. Jessup (APL-UW)

- 2011 Dynamics of the Madden-Julian Oscillation (DYNAMO), Nov 3 – Dec 13, role: lead radar scientist operating NASA TOGA C-Band Doppler radar used to measure precipitation; analyzed measurements of rain, the upper ocean, the lower atmosphere, and air-sea fluxes, R/V Roger Revelle, Chief Scientist: James N. Moum (OSU)
- 2011 Midlatitude Continental Convective Clouds Experiment (MC3E), May –June, role: launched radiosondes for DOE to test NASA Global Precipitation Measurement satellite algorithms; PI: Steven A. Rutledge (CSU)
- 2009 Engineers Without Borders Valparaiso Univ. Assessment Trip to Tanzania, Africa, May 15-24, role: designed and conducted Geographic Information System (GIS) project to map demographics and deteriorating water canal in primitive village
- 2008 Plains Convective Storms Student Field Study, May 2008, role: lead Doppler radar data interpreter for the forecasting and interception of severe storms in 20-student team; Supervisor: Bart Wolf (Valparaiso Univ.)
- 2007 Texas Commission for Environmental Quality Study (TexAQS II), June-July 2007, role: launched daily ozonesondes to study the atmospheric boundary layer and tropospheric ozone in urban environment of Houston; Supervisor: Gary Morris (Valparaiso Univ.)

## Refereed Publications

- Thompson E. J., W. E. Asher, A. T. Jessup, K. Drushka, 2019: High-resolution rain maps from an X-band marine radar and their use in understanding ocean freshening. *Oceanography* 32(2):xx-xx, <https://doi.org/10.5670/oceanog.2019.2xx>.
- W. E. Asher, K. Drushka, A. T. Jessup, E. J. Thompson, D. Clark, 2019: Estimating rain-generated turbulence at the ocean surface using the Active Controlled-Flux Technique. *Oceanography* 32(2):xx-xx, <https://doi.org/10.5670/oceanog.2019.2xx>.
- Drushka, K., W.E. Asher, A.T. Jessup, E.J. Thompson, S. Iyer, and D. Clark, 2019: Capturing fresh layers with the Surface Salinity Profiler. *Oceanography* 32(2):xx-xx, <https://doi.org/10.5670/oceanog.2019.2xx>.
- Thompson, E. J., Moum, J. N., Fairall, C. W., & Rutledge, S. A. 2019: Wind limits on rain layers and diurnal warm layers. *Journal of Geophysical Research: Oceans*, 124, 897-924. <https://doi.org/10.1029/2018JC014130>
- B. Dolan, B. Fuchs, S. A. Rutledge, E. A. Barnes, E. J. Thompson, 2018: Primary modes of global drop-size distributions. *J. Atmos. Sci.*, 75, 1453–1476, <https://doi.org/10.1175/JAS-D-17-0242.1>
- Thompson, E. J., S. A. Rutledge, B. Dolan, M. Thurai, and V. Chandrasekar, 2018: Dual-polarization radar rainfall estimation over tropical oceans. *J. Appl. Meteor. Climatol.*, 57, 755–775, <https://doi.org/10.1175/JAMC-D-17-0160.1>

Thompson, E. J., S. A. Rutledge, B. Dolan, and M. Thurai, 2015: Drop size distributions and radar observations of convective and stratiform rain over the equatorial Indian and west Pacific Oceans. *J. Atmos. Sci.*, 72, 4091-4125. <https://doi.org/10.1175/JAS-D-14-0206.1>

Moum, J. N., S. P. de Szoeke, W. D. Smyth, J. B. Edson, H. L. DeWitt, A. J. Moulin, E. J. Thompson, C. J. Zappa, S. A. Rutledge, R. H. Johnson, and C. W. Fairall, 2014: Air-sea interactions from MJO westerly wind bursts. *Bull. Am. Meteorol. Soc.*, 95, 1185-1199. <https://doi.org/10.1175/BAMS-D-12-00225.1>

Thompson, E. J., S. A. Rutledge, B. Dolan, V. Chandrasekar, and B.-L. Cheong, 2014: A dual-polarization radar hydrometeor classification algorithm for winter precipitation. *J. Atmos. Oceanic Technol.*, 31, 1457-1481. <https://doi.org/10.1175/JTECH-D-13-00119.1>

Willingham, K. M., E. J. Thompson, K. W. Howard, and C. L. Dempsey, 2010: Characteristics of Sonoran Desert microbursts. *Weather Forecast.*, 26, 94-108. <https://doi.org/10.1175/2010WAF2222388.1>

## **Committees and Science Teams**

2018-present Scientific steering committee of US CLIVAR workshop on Atmospheric Convection and Air-Sea Interaction over Tropical Oceans

2018-present Member, NASA Ocean Salinity Science Team

2018-present Member, NASA Precipitation Measurement Mission Team

## **Technological and Instrumentation Expertise**

Led the collection, quality-controlling, and processing of measurements from:

- CTDs: underway, profiling, through-flow, towed (ocean temperature, salinity, velocity)
- X-, C-, and S-band single and dual polarization Doppler radars (precipitation, wind)
- X-band marine navigation radar (precipitation)
- 2D-video and optical disdrometers: ground and ship-based (raindrop size distributions)
- surface meteorological instruments (wind, humidity, pressure, temperature, air-sea fluxes)
- radiosondes (meteorological data and ozone concentration)

## **Workshop Participation**

2018 NASA Coupled Ocean Surface Variables Workshop (APL-UW)

2017 NASA Global Ocean Salinity and Water Cycle Workshop (WHOI)

2017 NASA/GPM OLYMPEX Science Workshop (UW)

2017 Cross-cultural Communication Workshop (UW)

2016 NASA Coupled Ocean Surface Variables Workshop (APL-UW)

2014 NASA Jet Propulsion Laboratory (JPL) Summer School: Using Satellite Observations to Advance Climate Models

2011 American Meteorological Society Summer Policy Colloquium (Washington D.C.)

## Reviewer

Approximately 10 reviews total per year for: *Journal of the Atmospheric Sciences*, *Journal of Oceanic and Atmospheric Technology*, *Journal of Applied Meteorology and Climatology*, *Monthly Weather Review*, *Weather and Forecasting*, *Journal of Geophysical Research: Atmospheres*, *EGU Atmospheric Measurement Technique*, *Institute of Electrical and Electronics Engineers Sensors Journal*

## Awards and Honors

2016-2018	APL-UW SEED Postdoctoral Research Fellowship
2012-2015	NSF Graduate Research Fellowship
2010-2011	AMS Graduate Research Fellowship
2010	NSF Graduate Research Fellowship Program Honorable Mention
2010	Valparaiso Univ. Eugene M. Rasmussen Meteorology Scholarship and Service Award
2008-2010	NOAA Ernest F. Hollings Undergraduate Scholarship Program
2009	AMS John R. Hope Endowed Scholarship in Atmospheric Sciences
2009	NWA Arthur C. Pike Scholarship in Meteorology
2008-2009	Valparaiso Univ. Swim Team Captain
2006-2007	Valparaiso Univ. Swim Team MVP

## Mentoring and Outreach

2017-present	SeaTalk committee at APL-UW aimed at “building community between fieldgoers in APL and Oceanography” by addressing and preventing sexual harassment, improving communication techniques and effectively planning for field work: <a href="http://psc.apl.washington.edu/HLD/SEATALK/Seatalk.html">http://psc.apl.washington.edu/HLD/SEATALK/Seatalk.html</a>
2017	Volunteer at Polar Science Weekend “Waves in the Arctic” Exhibit
2016	Bush School 5th grade “Life as a Scientist” talk and student mentoring
2015	Presenter for PROGRESS: Promoting Geoscience Research, Education and Success, PI: Emily Fischer, CSU; Summary: PROGRESS workshops open up valuable professional development opportunities to undergraduate women in the geosciences.
2012-2016	Mentored student between middle and high school in meteorology and for general college preparation
2010	Weekly tutoring of two 7th graders for meteorology Olympiad contest
2008-2009	Engineers Without Borders: developing water resources project between Valparaiso University students and community in Tanzania, Africa

## Presentations

Thompson, E.J., J. N. Moum, C. W. Fairall, S. A. Rutledge, 2019: Wind Limits on Rain Layers and Diurnal Warm Layers. CLIVAR Workshop: Atmospheric Convection and Air-Sea Interactions over Tropical Oceans, Boulder, CO, poster

- Thompson, E. J., J. Thomson, 2018: Air-Sea Interaction during EUREC4A: Spatially distributed observations. Planning Workshop for the Atlantic Trade wind Ocean-Atmosphere Mesoscale Interaction Campaign (ATOMIC), Boulder, CO, oral
- Thompson, E. J., and M. Bourassa, 2018: Outstanding questions regarding air-sea interaction and near-surface processes, and how satellites can be used to find answers. NASA Coupled Surface Variables Workshop, Seattle, WA, oral (invited)
- Thompson, E. J., 2018: Salinity Stratification by Rain during SPURS-2. Synthesis Meeting for the Salinity Processes Upper Ocean Regional Study 2 Experiment, La Jolla, CA, oral.
- Thompson, E. J., K. Drushka, W. E. Asher, A. T. Jessup, J. J. Schanze and D. Clark, 2018: How is salinity stratification affected by surrounding precipitation variability? AGU Ocean Sciences, Portland, OR, oral
- K. Drushka, W. E. Asher, E. J. Thompson, S. Iyer, A. T. Jessup, and D. Clark, 2018: A mechanistic synthesis of turbulence measurements made during SPURS-2. AGU Ocean Sciences, Portland, OR, oral
- W. E. Asher, Kyla Drushka, E. J. Thompson, S. Iyer, A. T. Jessup, and D. Clark, 2018: Rain-generated ocean surface turbulence and salinity stratification. AGU Ocean Sciences, Portland, OR, poster
- J. J. Schanze, S. R Springer, G. S E. Lagerloef, and E. J. Thompson, 2018: The Physics of Very-Near Surface Salinity Stratification and its Effects on Satellite Salinity. AGU Ocean Sciences, Portland, OR, oral
- Thompson, E. J., J. Thomson, 2017: Air-Sea Interaction during EUREC4A: SWIFT Buoys, Wave Glider, and Underway Ship Measurements, Meeting for the Elucidating the Role of Cloud-Circulation Coupling in Climate Campaign (EUREC4A), New Orleans, LA, oral
- Thompson, E. J., K. Drushka, W. E. Asher, A. T. Jessup, J. J. Schanze and D. Clark, 2017: Utility of shipborne disdrometer and marine navigation radar observations during convective and stratiform rain. AMS 38th Conference on Radar Meteorology, Chicago, IL, oral: <https://ams.confex.com/ams/38RADAR/meetingapp.cgi/Paper/321223>
- Thompson, E. J., K. Drushka, W. E. Asher, J. J. Schanze, A. T. Jessup, and D. Clark, 2017: Predictability of tropical freshwater lenses due to convective and stratiform rain during SPURS-2. Global Ocean Salinity and Water Cycle Workshop, Woods Hole Oceanographic Institution, Woods Hole, MA, oral
- Thompson, E. J., K. Drushka, W. E. Asher, J. J. Schanze, A. T. Jessup, and D. Clark, 2017: Satellite Rain Rate from IMERG as a Predictor for Salinity Stratification in the Upper Meter of the Ocean during SPURS-2 Rain Events. AMS Annual Meeting, Seattle, WA, poster

- Drushka, K., W. E. Asher, E. J. Thompson, A.T. Jessup, D. Clark, 2017: Observations of near-surface fresh layers during SPURS-2. European Geophysical Union General Assembly Conference Abstracts 19, 10658, oral
- Thompson, E. J., S. A. Rutledge, B. Dolan, M. Thurai, V. Chandrasekar, 2017: Dual-polarization radar rainfall estimation over warm tropical oceans. AMS Annual Meeting, Seattle, WA, poster
- Asher, W. E., E. J. Thompson, K. Drushka, A. T. Jessup, J. J. Schanze, D. Clark, 2016: Comparing spatial scales of IMERG rain with depth-resolved near-surface salinity structure as measured during the SPURS-2 experiment. AGU Fall Meeting, San Francisco, CA, poster
- Thompson, E. J., W. E. Asher, K. Drushka, A. T. Jessup, J. J. Schanze, D. Clark, 2016: Rain Rate from IMERG as a Predictor for Salinity Stratification in the Upper Meter of the Ocean during SPURS-2 Rain Events. AGU Fall Meeting, San Francisco, CA, oral
- Thompson, E. J., S. A. Rutledge, J. N. Moum, C. W. Fairall, 2016: Rain-formed and diurnal warming-formed near-surface ocean mixed layers: impacts on SST throughout the MJO. AMS 31st Conference on Hurricanes and Tropical Meteorology, San Juan, PR, oral: <https://ams.confex.com/ams/32Hurr/webprogram/meeting.html#Friday1>
- Timothy J. Lang, NASA/MSFC, Huntsville, AL; and B. Dolan, B. Fuchs, P. Hein, E. J. Thompson, S. Collis, J. Helmus, and N. Guy, 2015, Marshall Space Flight Center and the open-source radar software revolution. AMS 37th Conference on Radar Meteorology, Norman, OK, oral
- Michael J. Dixon, NCAR, Boulder, CO; and J. W. Wilson, T. M. Weckwerth, D. Albo, and E. J. Thompson, 2015, A dual-polarization QPE method based on the NCAR Particle ID algorithm - description and preliminary results. AMS 37th Conference on Radar Meteorology, Norman, OK, oral
- Thompson, E. J., S. A. Rutledge, 2015: Potential Benefits of Dual-Polarization Radar during SPURS-2: Mesoscale Precipitation Patterns in the Eastern Pacific Ocean. Planning Meeting for the NASA Salinity Processes Upper Ocean Regional Study 2 Experiment, La Jolla, CA, oral
- Thompson, E. J., S. A. Rutledge, J. N. Moum, C. W. Fairall, 2014 Influence of precipitating systems on upper Indian Ocean stability during DYNAMO. AGU Fall Meeting, San Francisco, CA, poster
- Thompson, E. J., J. M. Peters, R. S. Schumacher, S. A. Rutledge, 2014: Explaining low convective echo top heights during a strong DYNAMO westerly wind burst. AMS 31st Conference on Hurricanes and Tropical Meteorology, San Diego, CA, poster

- Thompson, E. J., S. Rutledge, J. N. Moum, C. W. Fairall, S. P. de Szoeko, A. Brewer, 2014  
Oceanic influence of atmospheric cold pools during DYNAMO. AMS 31st Conference on  
Hurricanes and Tropical Meteorology, San Diego, CA, oral
- Thompson, E. J., S. A. Rutledge, B. Dolan, R. A. Rilling, M. Dixon, S. M. Ellis, and W. Xu,  
2013: Radar Rainfall estimation during DYNAMO. AMS 36th Conference on Radar  
Meteorology, Breckenridge, CO, poster
- Thompson, E. J., S. A. Rutledge, B. Dolan, V. Chandrasekar, and B. L. Cheong, 2013: A dual-  
polarization radar hydrometeor classification algorithm for winter precipitation. AMS 36th  
Conference on Radar Meteorology, Breckenridge, CO, oral:  
<https://ams.confex.com/ams/36Radar/webprogram/Paper228449.html>
- Thompson, E. J., S. Rutledge, Timothy. J. Lang, 2012. Radar analysis of precipitation influenced  
by tropical cyclone-MJO interaction during DYNAMO. AGU Fall Meeting, San Francisco,  
CA, oral
- Morris, G.A., D. Martins, A. Thompson, A. Reed, E. Joseph, and E. Thompson, 2012: The  
impact of radiosonde pressure sensor errors on ozone profiles and columns as reported by  
ozonesondes, Quadrennial Ozone Symposium, Toronto, Canada.
- Thompson E. J., K. M. Willingham, K. W. Howard, 2010. Characteristics of Sonoran Desert  
Microbursts. AMS Annual Meeting, Atlanta, GA, oral
- Thompson, E. J., Brian J. Lasorsa and Steven M. Zubrick, 2009: The February 2007 Valentine's  
Day Storm: Diagnosis and Impact on the Washington, DC Area. AMS Annual Meeting,  
Student Conference, Phoenix, AZ, poster
- Thompson, E. J., S. A. Rogowski, S. M. Zubrick, S. A. Listemaa, 2008: Analysis of 4 July 2006  
Washington, DC Severe Thunderstorm: Overview with Synoptic and Mesoscale  
Assessment, 33rd Annual National Weather Association Meeting, Student Conference,  
Louisville, KY, poster (award winner)
- Ford, B. G. A. Morris, X. Li, B. Rappenglueck, D. Byun, B. Lefer, R. Perna, R. Boudreaux, B.  
McEvoy-Day, L. Pedemonte, E. Thompson, 2008: The impact of residual layer ozone on  
surface ozone levels in Houston, Texas during TexAQS II, 10th Conference on Atmospheric  
Chemistry, 88th Annual AMS Meeting, New Orleans, LA, poster