

## **EDUCATION**

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**Doctorate in Analytical Chemistry** **Dec 2020**  
*Purdue University, West Lafayette, Indiana*

**Bachelor of Science Double Major in Chemistry and Sustainability Science** **2015**  
*Furman University, Greenville, South Carolina*

## **RESEARCH EXPERIENCE**

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**Senior Postdoctoral Associate: SOMAS, Stony Brook University** **Jan 2021 – present**  
**Advisor: Paul B. Shepson, Ph.D.**

*Aircraft based greenhouse gas measurements*

- Processed atmospheric data through Matlab, R, and Igor
- Archived over 10 years of flight data in a user-friendly format to make accessible
- Planned and flew in several field campaigns and single-day flight experiments

**Graduate Research Assistant: Chemistry, Purdue University** **Aug 2015 – Dec 2020**  
**Advisor: Paul B. Shepson, Ph.D.**

*Aircraft based greenhouse gas measurements*

- Processed atmospheric data through Matlab, R, and Igor
- Quantified power plant emission rates of CO<sub>2</sub> and CH<sub>4</sub> via airborne mass balance experiments
- Investigated CO<sub>2</sub> inventory performance in a complex urban environment (New York City) via dispersion modeling in a Harvard collaboration
- Planned and flew in several field campaigns and many single-day flight experiments
- Mentored younger graduate students in both data analysis and data collection

**Research Assistant: EES Department, Furman University** **Summer 2014 – Spring 2015**

*Spring water chemistry as it relates to fault zones*

- Collected field measurements from springs in SC along with samples for offline analysis
- Analyzed samples with a suite of instruments including an IC, ICP-AES, fluorimeter for NH<sub>4</sub> levels, etc.

**Research Assistant: Business Department, Furman University** **Summer 2013**

*Global Sustainability in Guatemala: Survey Work*

- Created a survey based on relevant literature with guidance from the research professor
- Led data collection in Guatemala. Involved interviewing local Guatemalans in 4 groups.
- Basic GIS analysis and publication of results

**Research Assistant: Chemistry Department, Furman University** **Summer 2012 & Fall 2012**

*Surface Modifications of Alginate-Conducting Polymer Composites*

- Performed multiple published syntheses while supervised by a graduate student
- Analyzed products using NMR, GC-MS, UV, IR, and a contact angle device

**Research Assistant: EES Department, Furman University** **Fall 2011 – Spring 2012**

*Waste Audit*

- Assessed the composition of residential waste focusing on potentially recyclable material
- Work is published in Resources, Conservation, and Recycling  
DOI: <https://doi.org/10.1016/j.resconrec.2012.06.002>

*Nanotechnology in the Medical Field*

- Assisted researchers in the NC State Research Center at the David Henry Murdock Research Institute
- Assisted in investigating the correlation between color and nutrient (leucine) content using a spectrophotometer
- Analyzed cell images to help pursue a method to predict cell division for use in cancer research

**SKILLS**


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Instrumentation:	Cavity Ringdown IR, 2B O <sub>3</sub> analyzer, Grimm Aerosol Spectrometer, IR, H <sup>1</sup> NMR and C <sup>13</sup> NMR, UV-Vis, GC-TOF-MS, contact angle measurement device, IC, ICP-AES, Alkalinity titrations, fluorimeter for NH <sub>4</sub> concentrations, dissolved organic carbon analyzer, total dissolved nitrogen analyzer
Computer Skills:	Igor Pro, R, Microsoft Office, Matlab, Linux, QGIS, HPC Systems, LaTeX

**AWARDS**


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Stony Brook Postdoc Spotlight	2021
<ul style="list-style-type: none"> <li>• Tied for 3<sup>rd</sup> place of 9 participants.</li> <li>• Presented current research in 5 min to a broad, non-specialist audience. Videos available at: <a href="https://www.stonybrook.edu/commcms/postdoc/spotlight/spotlight-2021">https://www.stonybrook.edu/commcms/postdoc/spotlight/spotlight-2021</a></li> </ul>	
Furman Fellow Leadership Award	2014
<ul style="list-style-type: none"> <li>• "The fellowships are awarded annually to five members of the senior class who have shown unique leadership skills and an ability to make a difference in the world and in the lives of others."</li> </ul>	
Research Experiences for Undergraduates Funding Award	2012

**TEACHING AND VOLUNTARISM**


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Frequent platelet donor (2x/month)	2009 – present
Member of Purdue's chapter of Phi Lambda Upsilon (PLU) chemistry honors society	2016 – 2021
<ul style="list-style-type: none"> <li>• PLU hosted science outreach events for local community (<math>\geq 1</math>/semester)</li> </ul>	
Lab Safety Officer	2016 – 2019
Atmospheric Chemistry Outreach Events, Purdue University	2017, 2018
<ul style="list-style-type: none"> <li>• Discussed CO<sub>2</sub> instrumentation and research to high school students</li> <li>• Prepared poster as visual aid for the work</li> </ul>	
Graduate Teaching Assistant, Purdue University	2015 – 2016
<ul style="list-style-type: none"> <li>• Led 2 sections of recitation and labs for intro chemistry for 2 semesters. ~24 students each.</li> <li>• Hand graded work, ran/planned recitation and labs, proctored exams, and held office hours</li> </ul>	
Tutoring, Furman University	2014 – 2015
<ul style="list-style-type: none"> <li>• Walk in tutoring of students in early chemistry courses 2 hours a week in a group setting</li> <li>• Additionally, tutored an individual in 1 on 1 sessions as needed (approximately once per week)</li> </ul>	
Member of Global Sustainability Club	2013 – 2015
Member of Bartram Society (Environmental Earth Science honor society)	2013 – 2015
Founding member of Alpha Phi Omega (service group), Furman University	2013 – 2015
<ul style="list-style-type: none"> <li>• Treasurer of Alpha Phi Omega</li> </ul>	2013 – 2014
Furman Farm, Greenville, South Carolina	2012 – 2015

Member of Habitat for Humanity, Furman University	2011 – 2014
• Volunteer Coordinator	2012
Member of Environmental Action Group, Furman University	2011 – 2013
• Vice President	2012
Ran volunteer chemical demonstration for afterschool students as part of REU	Summer 2012

## **WORK EXPERIENCE**

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Farm May X – 3-week course living on a family farm in Iowa	May of 2014
• Visited industrial farms, sustainable farms, and companies within the food industry	
• Worked briefly with the family in large-scale spraying and tilling	
• Blogged about the trip regularly, blog available at <a href="http://iowafurmanfarm.org/blog-2/">http://iowafurmanfarm.org/blog-2/</a>	
David E. Shi Center for Sustainability, Greenville, South Carolina	2012 – 2015
• Completed greenhouse gas inventory for American College and University Presidents’ Climate Commitment ( <a href="https://reporting.secondnature.org">https://reporting.secondnature.org</a> )	
• Presented data to both informed and general audiences	
• Supervised students in completing a greenhouse gas inventory and the Sustainability Tracking, Assessment, and Rating System program (STARS, <a href="https://stars.aashe.org/">https://stars.aashe.org/</a> )	
Furman Farm, Greenville, South Carolina	2011 – 2012
• Learned about organic gardening and improving soil quality without chemical fertilizers	
• Worked on composting, solarization, natural insecticides, compost tea, etc.	

## **PUBLICATIONS**

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1. Pitt, J. R., I. Lopez-Coto, **K. D. Hajny**, J. Tomlin, R. Kaeser, T. Jayarathne, B. H. Stirm, C. R. Floerchinger, C. P. Loughner, C. K. Gately, L. R. Hutyra, K. R. Gurney, G. S. Roest, J. Liang, S. Gourdjji, A. Karion, J. R. Whetstone, P. B. Shepson. “New York City Greenhouse Gas Emissions Estimated with Inverse Modeling of Aircraft Measurements.” *Elementa: Science of the Anthropocene*. 10 (2022) DOI: <https://doi.org/10.1525/elementa.2021.00082>
2. Jones, T. S., J. E. Franklin, J. Chen, F. Dietrich, **K. D. Hajny**, J. C. Paetzold, A. Wenzel, C. Gately, E. Gottlieb, H. Parker, M. Dubey, F. Hase, P. B. Shepson, L. H. Mielke, S. C. Wofsy. “Assessing Urban Methane Emissions Using Column-Observing Portable Fourier Transform Infrared (FTIR) Spectrometers and a Novel Bayesian Inversion Framework.” *Atmospheric Chemistry and Physics*. 21 (2021) DOI: <https://doi.org/10.5194/acp-21-13131-2021>
3. Floerchinger, C., P. B. Shepson, **K. D. Hajny**, B. C. Daube, B. H. Stirm, C. Sweeney, S. C. Wofsy. “Relative Flux Measurements of Biogenic and Natural Gas-Derived Methane for Seven U.S. Cities.” *Elementa: Science of the Anthropocene*. 9 (2021) DOI: <https://doi.org/10.1525/elementa.2021.000119>
4. Olsen, N. E., N. W. May, R. M. Kirpes, A. E. Watson, **K. D. Hajny**, J. H. Slade, P. B. Shepson, B. H. Stirm, K. A. Pratt, A. P. Ault. “Lake Spray Aerosol Incorporated into Great Lakes Clouds.” *Earth and Space Chemistry*. 3 (2019) DOI: <https://doi.org/10.1021/acsearthspacechem.9b00258>
5. **Hajny, K. D.**, O. E. Salmon, J. Rudek, D. R. Lyon, A. A. Stuff, B. H. Stirm, R. Kaeser, C. R. Floerchinger, S. Conley, M. L. Smith, and P. B. Shepson. “Observations of Methane Emissions from Natural Gas-Fired Power Plants” *Environmental Science & Technology*. 53 (2019) DOI: <https://doi.org/10.1021/acs.est.9b01875>

6. Salmon, O.E., L.R. Welp, M. Baldwin, **K. Hajny**, B. H. Stirm, and P. B. Shepson. “Vertical Profile Observations of Water Vapor Deuterium Excess in the Lower Troposphere.” *Atmospheric Chemistry and Physics*, 19 (2019): 1 – 35. DOI: <https://doi.org/10.5194/acp-19-11525-2019>
7. Bonin, T. A., B. J. Carroll, R. M. Hardesty, W. A. Brewer, **K. Hajny**, O. E. Salmon, and P. B. Shepson. “Doppler Lidar Observations of the Mixing Height in Indianapolis Using an Automated Composite Fuzzy Logic Approach.” *Journal of Atmospheric and Oceanic Technology*, 35 (2018): 473–490. DOI: <https://doi.org/10.1175/JTECH-D-17-0159.1>
8. **Hajny, K. D.**, and B. W. Clemens. “Water and Wealth: A Guatemalan Case Study.” *Journal of Economics and Economic Education Research* 16.2 (2015): 119 – 36. Available at <https://www.abacademies.org/journals/month-august-year-2015-vol-16-issue-2-journal-jeer-past-issue.html>

### In Preparation

1. **Hajny, K. D.**, J. M. Tomlin, T. Jayarathne, C. Floerchinger, R. Kaeser, B. H. Stirm, P. B. Shepson, C. Gately, T. Jones, S. Wofsy, K. Gurney. “Estimating Anthropogenic CO<sub>2</sub> Emissions from New York City Using Aircraft Measurements and Dispersion Modeling.” 01/2022 - Submitted to *Elementa: Science of the Anthropocene*.
2. **Hajny, K. D.**, J. M. Tomlin, T. Jayarathne, C. Floerchinger, R. Kaeser, B. H. Stirm, P. B. Shepson, A. Stuff, A. Armstrong, B. Wulle, O. E. Salmon, T. Lavoie, D. Lyon, J. Rudek. “Assessing the Bias and Uncertainties in the Airborne Mass Balance Technique.” *In preparation*.

## PRESENTATIONS

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### Presented:

**Hajny, K. D.**, I. Lopez-Coto, T. Lavoie, J. Rudek, A. Armstrong, C. Floerchinger, T. Jayarathne, R. Kaeser, D. Lyon, O. E. Salmon, B. H. Stirm, A. Stuff, J. M. Tomlin, B. Wulle, P. B. Shepson. *Assessing Bias and Uncertainties in the Airborne Mass Balance Technique*. Fall meeting of the American Geophysical Union, 2021, New Orleans, Louisiana. **Oral**

Shepson, P. B., J. R. Pitt, I. Lopez-Coto, **K. D. Hajny**, J. M. Tomlin, R. Kaeser, T. Jayarathne, B. H. Stirm, C. R. Floerchinger, C. Loughner, R. Commane, C. Gately, L. Hutyla, K. R. Gurney, G. S. Roest, J. Liang, A. Karion, J. R. Whetstone. *A High-Resolution Inventory for Inverse Modeling of New York City Methane Emissions*. Fall meeting of the American Geophysical Union, 2021, New Orleans, Louisiana. **Poster**

**Hajny, K. D.**, C. R. Floerchinger, J. R. Pitt, I. Lopez-Coto, J. M. Tomlin, R. Kaeser, B. H. Stirm, T. Jayarathne, C. Gately, M. Sargent, K. Gurney, G. Roest, A. Turner, L. Hutyla, P. B. Shepson, S. Wofsy. *Application of a Spatially Explicit Scaling Factor Method on CO<sub>2</sub> Emissions from New York*. European Geophysical Union General Assembly, 2021, digital meeting. **Poster**

**Hajny, K. D.**, T. Jayarathne, J. M. Tomlin, J. R. Pitt, C. R. Floerchinger, I. Lopez-Coto, R. Kaeser, B. H. Stirm, C. Gately, L. Hutyla, M. R. Sargent, K. R. Gurney, G. S. Roest, A. J. Turner, P. B. Shepson, S. C. Wofsy. *Estimating Anthropogenic CO<sub>2</sub> Emissions from New York City Using Aircraft Measurements and Dispersion Modelling*. Fall meeting of the American Geophysical Union, 2020, digital meeting. **Poster**

Shepson, P., J. R. Pitt, K. Jayarathne, **K. D. Hajny**, C. R. Floerchinger, S. Wofsy, J. Tomlin. *Quantification of CO<sub>2</sub> and CH<sub>4</sub> Emission Rates for New York City*. Fall meeting of the American Geophysical Union, 2019, San Francisco, CA. **Oral**

**Hajny, K. D.**, P. B. Shepson, B. H. Stirm, R. Kaeser, A. Stuff, A. Armstrong, B. Wulle, D. Lyon, J. Rudek, T. Lavoie, O. E. Salmon, C. Floerchinger, T. Jayarathne, J. M. Tomlin. *Assessing the Accuracy and Precision of the Airborne Mass Balance Technique*. Fall meeting of the American Geophysical Union, 2019, San Francisco, CA. **Poster**

**Hajny, K. D.**, P. B. Shepson, B. H. Stirm, R. Kaeser, A. Stuff, B. Wulle, D. Lyon, J. Rudek. *Assessing the Accuracy and Precision of the Airborne Mass Balance Technique*. Gordon Research Conference – Atmospheric Chemistry, 2019, Newry, ME, **Poster**

**Hajny, K. D.**, P. B. Shepson, C. Floerchinger, J. Rudek, A. Stuff, R. Kaeser, B. H. Stirm. *Assessing the Greenhouse Gas Emissions from Natural Gas Fired Power Plants*. Fall meeting of the American Geophysical Union, 2018, Washington, D.C. **Poster**

**Hajny, K. D.**, P. B. Shepson, J. Rudek, B. H. Stirm, R. Kaeser, A. Stuff. *Assessing the Greenhouse Gas Emissions from Natural Gas Fired Power Plants*. Fall meeting of the American Geophysical Union, 2017, New Orleans, Louisiana. **Poster**

**Hajny, K. D.**, K. Davis, J. Franklin, R. Harvey, T. Lavoie, N. Miles, S. Richardson, O. E. Salmon, D. Sarmiento, S. Wofsy, B. H. Stirm, P. B. Shepson. *A Collaborative Study of Source Apportionment and Spatially Resolved Total City Emissions of CH<sub>4</sub> from Indianapolis*. Fall meeting of the American Geophysical Union, 2016, San Francisco, California. **Poster**

**Hajny, K. D.**, J. M. Garihan. *Upstate Springs Project Part II: Spring Water Chemistry as an Indicator of Fault, Fracture, and Joint Network Control of Groundwater Flow in a Crystalline Terrain, Slater and Dacusville Quadrangles, Greenville and Pickens Counties, South Carolina*. Geological Society of America southeastern section meeting, 2015, Chattanooga, Tennessee. **Poster**

**Hajny, K. D.**, B. W. Clemens. *Water and Wealth: A Guatemalan Case Study*. American Association of Geographers, 2014, Tampa, Florida. **Poster**

**Hajny, K. D.**, H. Gordhan, T. Hanks. *Surface Modifications of Alginate-Conducting Polymer Composites*. Southeastern Regional Meeting of the American Chemical Society, 2012, Raleigh, North Carolina. **Poster**

#### **Coauthored:**

Hope, A., I. Lopez-Coto, **K. D. Hajny**, J. M. Tomlin, A. Karion, J. Whetstone, P. B. Shepson. *Analyzing Turbulent Kinetic Energy Predictions at the “Grey Zone” from Three WRF-PBL Schemes, with Comparison to Aircraft Measurements Over New York City*. Fall meeting of the American Geophysical Union, 2021, New Orleans, Louisiana. **Poster**

Pitt, J. R., I. Lopez-Coto, **K. D. Hajny**, J. M. Tomlin, R. Kaeser, T. Jayarathne, B. H. Stirm, C. R. Floerchinger, C. Loughner, R. Commane, C. Gatley, L. Hutya, K. Gurney, G. Roest, J. Liang, A. Karion, J. Whetstone, P. B. Shepson. *Development of a High-Resolution Prior for Inverse Modelling of New York City Methane Emissions*. European Geophysical Union General Assembly, 2021, digital meeting. **Poster**

Tomlin, J. M., **K. D. Hajny**, J. R. Pitt, R. Kaeser, T. Jayarathne, B. H. Stirm, C. R. Floerchinger, R. Commane, I. Lopez-Coto, A. Karion, P. B. Shepson. *Comparison of Multiple Approaches for Quantifying Winter Greenhouse Gas Emissions in New York City Based on Aircraft Measurements*. Fall meeting of the American Geophysical Union, 2020, digital meeting. **Oral**

Pitt, J. R., I. Lopez-Coto, **K. D. Hajny**, J. M. Tomlin, R. Kaeser, T. Jayarathne, B. H. Stirm, C. R. Floerchinger, C. Loughner, R. Commane, C. Gately, L. Hutyla, K. R. Gurney, G. S. Roest, J. Liang, A. Karion, J. R. Whetstone, P. B. Shepson. *New York City Greenhouse Gas Emissions with Inverse Modelling of Aircraft Measurements*. Fall meeting of the American Geophysical Union, 2020, digital meeting. **Poster**

Floerchinger, C.R., S.C. Wofsy, **K. D. Hajny**, C. Sweeney, T. Newberger, E.A. Kort, G. Plant, A. Gvakharia, P. B. Shepson. *Fractional Methane Emissions from Natural Gas Infrastructure in Urban Domains in the Eastern United States using Airborne Measurements and Lagrangian Particle Dispersion Modeling*. Fall meeting of the American Geophysical Union, 2018, Washington, D.C. **Poster**

Tomlin, J.M., **K. D. Hajny**, O. E. Salmon, B. H. Stirm, B. S. Hardiman, P. B. Shepson. *Quantifying Background CO<sub>2</sub> Emission in Rural Sites Around Indianapolis Using Airborne Eddy Covariance Flux Measurements*. Fall meeting of the American Geophysical Union, 2018, Washington, D.C. **Poster**

## **PROFESSIONAL ORGANIZATIONS**

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Member of the American Chemical Society (ACS)	2011, 2014, 2017– present
Member of the American Geophysical Union (AGU)	2016 – present
Member of the European Geophysical Union (EGU)	2021
Member of the Geological Society of America (GSA)	2015 – 2016
Member of the Association of American Geographers (AAG)	2014 – 2015