

Alexander L. Frie

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University of Minnesota, Department of Soil, Water, and Climate

Education

- 2019 **Doctor of Philosophy in Environmental Science** (Environmental Chemistry)
University of California Riverside • 3.97/4.0 • Advisor: Roya Bahreini
Dissertation Title: “Studies on the Sources and Properties of Natural and Anthropogenic Aerosols”
Committee Members: Dr. Ying-Hsuan Lin, Dr. Samantha Ying, Dr. Roya Bahreini
- 2015 **Bachelor of Arts in Chemistry** (Environmental Chemistry)
Saint John’s University and College of Saint Benedict
History Minor • Departmental Distinction in Chemistry • All College Honors

Research Positions

- 2020 **Postdoctoral Associate**, University of Minnesota
- 2019-20 **Assistant Researcher**, Lake Superior Research Institute, University of Wisconsin-Superior
- 2015-19 **Graduate Researcher**, University of California Riverside, Supervisor: Dr. Roya Bahreini
- 2014 **Undergraduate Researcher**, University of Wisconsin Milwaukee, Supervisor: Dr. L. Guo
- 2012,14 **Research Assistant**, Saint John’s University Supervisors: Dr. C. Stollo, Dr. K. Graham

Peer-Reviewed Publications

**indicates equally contributing authors

Jin Y. Chen, Emmy Rodriguez, Huanhuan Jiang, Kunpeng Chen, **Alexander Frie**, Haofei Zhang, Roya Bahreini, Ying-Hsuan Lin. “Time-Dependent Density Functional Theory Investigation of the UV–Vis Spectra of Organonitrogen Chromophores in Brown Carbon” *ACS Earth and Space Chem.* **2020** DOI: [10.1021/acsearthspacechem.9b00328](https://doi.org/10.1021/acsearthspacechem.9b00328)

CM Sabbir Ahmed, Yumeng Cui, **Alexander L Frie**, Abigail Burr, Rohan Kamath, Jin Y Chen, Arafat Rahman, Tara Nordgren, Ying-Hsuan Lin, Roya Bahreini. “Exposure to Dimethyl Selenide (DMSe)-Derived Secondary Organic Aerosol Alters Transcriptomic Profiles in Human Airway Epithelial Cells.” *Environ. Sci. and Technol.* **2019** DOI: [10.1021/acs.est.9b04376](https://doi.org/10.1021/acs.est.9b04376)

Alexander L. Frie, Alexis Garrison, Mia Maltz, Jon Botthoff, Steve Bates, Timothy Lyons, Michael Schaefer, Samantha Ying, Michael Allen, Emma Aronson, Roya Bahreini. “Dust Sources in the Salton Sea Basin: A Clear Case of an Anthropogenically Impacted Dust Budget” *Environ. Sci. and Technol* **2019** DOI: [10.1021/acs.est.9b02137](https://doi.org/10.1021/acs.est.9b02137)

Zhuang, Wen, Samantha C. Ying, **Alexander L. Frie**, Qian Wang, Yongxia Liu, Qing Chen.”Distribution, pollution status, and source apportionment of trace metals in lake sediments under the influence of the South-to-North Water Transfer Project, China” *Science of the Total Environment* **2019** DOI: [10.1016/j.scitotenv.2019.03.306](https://doi.org/10.1016/j.scitotenv.2019.03.306).

Huanhuan Jiang** and **Alexander L. Frie****, Jin Chen, Avi Lavi, Haofei Zhang, Roya Bahreini, Ying-Hsuan Lin “Brown Carbon Formation from Nighttime Chemistry of Heterocyclic Aromatic Compounds.” *Environ. Sci. and Tech. Letters* **2019**, DOI:[10.1021/acs.estlett.9b00017](https://doi.org/10.1021/acs.estlett.9b00017)

Dingle, Justin, Stephen Zimmerman, **Alexander L. Frie**, Justin Min, Heejung Jung, Roya Bahreini. "Complex Refractive Index, Single Scattering Albedo, and Mass Absorption Coefficient of Secondary Organic Aerosols Generated from Oxidation of Biogenic and Anthropogenic Precursors" *Aerosol Science & Technology*. **2019**, DOI:[10.1080/02786826.2019.1571680](https://doi.org/10.1080/02786826.2019.1571680)

Frie, Alexander L., Justin H. Dingle, Samantha C. Ying, and Roya Bahreini. "The Effect of a Receding Saline Lake (The Salton Sea) on Airborne Particulate Matter Composition." *Environ. Sci. and Technol.* **2017**, DOI: [10.1021/acs.est.7b01773](https://doi.org/10.1021/acs.est.7b01773)

Related Media:

- Studying Dust Around the Salton Sea, Scientists Find Initial Answers, *Desert Sun*, August 4th 2017.
- New Study Traces Airborne Dust To Shrinking Salton Sea, *KPBS*, August 8th 2017.

Technical Reports

Olivia Anders, Kimberly Beesley, Lana Fanberg, **Alexander Frie**, Tom Markee, Heidi Schaefer, Christine Polkinghorne, Kelsey Prihoda, Heidi Saillard, Matthew Teneyck. Bench Scale technical Report: Tests of The Nano Bubble Ozone Technology (2.5 HP Unit). **2020**

<https://minds.wisconsin.edu/handle/1793/80297>

Olivia Anders, Kimberly Beesley, Lana Fanberg, **Alexander Frie**, Tom Markee, Deanna Regan, Heidi Schaefer, Christine Polkinghorne, Kelsey Prihoda, Heidi Saillard, Matthew Teneyck. Bench Scale Technical Report: Tests of The Nano Bubble Ozone Technology (3 HP Unit). **2019**

<https://minds.wisconsin.edu/handle/1793/79880>

Olivia Anders, Lana Fanberg, **Alexander Frie**, Tom Markee, Christine Polkinghorne, Kelsey Prihoda, Heidi Saillard, Matthew Teneyck. Bench Scale Technical Report: Tests Of The Led Light Activated Titanium Dioxide Bench-scale Ballast Water Treatment Process. **2019**

<https://minds.wisconsin.edu/handle/1793/79428>

Selected Presentations

- 2019 **Frie, Alexander**, Roya Bahreini. *Estimating Uncertainties in Refractive Index Retrievals from Optical Closure Calculations using Full Aerosol Size Distributions*. American Association of Aerosol Research Conference (Oral)
- 2019 **Alexander Frie**. *Searching for Sources: Ambient Dust in the Salton Sea Basin and Brown Carbon Aerosols from Heterocyclic Compounds*. Pacific Northwest National Laboratory. **(Oral, Invited)**
- 2018 **Frie, Alexander**, Alexis Garrison, Mia Maltz, Jon Botthoff, Steve Bates, Timothy Lyons, Emma Aronson, Roya Bahreini. *Impact of a Shrinking Saline Lake (Salton Sea) on Regional Dust Deposition and Composition*. International Aerosol Conference (Oral).
- 2018 **Frie, Alexander**, Alexis Garrison, Justin Dingle, Mia Maltz, Jon Botthoff, Steve Bates, Timothy Lyons, Samantha Ying, Emma Aronson, Roya Bahreini. *Searching for Particulate Sources Near the Salton Sea*. 2018 Salton Sea Symposium, Shrinking Shorelines and the Salton Sea. University of California Riverside, Palm-Desert Campus. **(Oral, Invited)**
- 2017 **Frie, Alexander**, Justin Hernandez Dingle, Alexis Garrison, Samantha Ying, Roya Bahreini. *Particulate Matter Sources and Composition near a Shrinking Saline Lake (Salton Sea)*. American Geophysical Union Conference (Oral)
- 2017 **Frie, Alexander**, Justin Dingle, Stephen Zimmerman, Justin Min, Roya Bahreini. *Optical Properties of Secondary Organic Aerosol Generated via Photooxidation in Single and Multiple Precursor Systems*. American Association of Aerosol Research Conference (Poster)

- 2016 **Frie, Alexander**, Justin Dingle, Roya Bahreini, Sam Ying. *Metal Composition and Source Identification of Particulate Matter around a Shrinking, Saline Lake (Salton Sea)*. American Association of Aerosol Research Conference (Oral)

Awards and Financial Support

- 2018 **IAC Student Travel Grant**
International Aerosol Conference
- 2017 **Albert Marsh Environmental Sciences Scholarship**
University of California, Riverside, Department of Environmental Sciences
- 2016 **Association of Environmental Professionals Student Scholarship**
Association of Environmental Professionals, Inland Empire Chapter
- 2015 **Provost Research Fellowship**
University of California Riverside

Teaching and Mentorship

- 2018 **Graduate Student Mentor**
Underrepresented Students Pursuing Agriculture-Related Careers
- 2018 **Teaching Assistant**
Introduction to Atmospheric Science
- 2017 **Graduate Student Mentor**
Fertile Futures Undergraduate Research Program
- 2016 **Teaching Assistant**
Introduction to Environmental Science.

Service and Outreach

- 2019- **Reviewer**
Science of the Total Environment, Atmospheric Chemistry and Physics, Environmental Pollution
- 2018 **Session Co-Chair**
Source Apportionment Poster Session I, International Aerosol Conference
- 2016-18 **Environmental Science Mini-GSA Co-President**
University of California Riverside, Department of Environmental Science
- 2016-17 **Atmospheric Journal Club Facilitator**
UC-Riverside
- 2017 **Student Assistant**
American Association of Aerosol Research Conference
- 2017 **EDGE Symposium Planning Committee**
University of California Riverside
- 2017 **Student Advisory Committee: Environmental Statistics Hire**
UCR Department of Environmental Sciences
- 2016-17 **Science Olympiad Coach: Hydrogeology**
Riverside Stem Academy
- 2016-17 **Geoscience Education Outreach Program**
University of California, Riverside, Department of Earth Science
- 2016 **Student Advisory Committee: Climate Change and Sustainability Hire**
University of California, Riverside, Department of Environmental Science

Professional Affiliations

American Geophysical Union, American Association of Aerosol Research