

Thilina Jayarathne

5151, Brown Laboratory of Chemistry, Purdue University, West Lafayette, Indiana-47907, USA
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EDUCATION

- PhD. University of Iowa**, Iowa City, IA, 52242, USA 2017
Chemistry
Thesis: *Chemical Characterization of Biomass Burning and Sea Spray Aerosol*
- B.Sc., University of Sri Jayewardenepura**, Nugegoda, Sri Lanka 2008
Majors: Forestry & Environmental Science, Chemistry and Zoology

RESEARCH EXPERIENCE

- Post-Doctoral Research Associate** 2017-Present
Department of Chemistry, Purdue University, West Lafayette, IN, USA
Advisor: Paul B. Shepson, PhD.
- Applying advanced analytical techniques for characterizing biogenically derived secondary organic aerosol (e.g. UPLC/ESI-ToF MS/MS, CIMS, GC-MS, GC-FID, FTIR)
 - Developing new methods for separation and quantification of organic compounds from chamber reactions using UPLC/ESI-ToF MS/MS, CIMS, GC-MS
 - Supervising graduate and undergraduate laboratory assistants
- Graduate Research Assistant** 2011-2017
Department of Chemistry, University of Iowa, Iowa City, IA, USA
Advisor: Elizabeth A. Stone, PhD.
- Applied analytical methods for aerosol characterization using advanced techniques (e.g. HILIC-TQD-MS, HPLC-PAD, GC-MS, IC-CD, ICP-MS, SEM-EDX)
 - Developed new methods for separation and quantification of organic compounds from complex environmental samples using GC-MS and HPLC-PAD
 - Collected laboratory and field aerosol samples for chemical speciation
 - Supervised undergraduate laboratory assistants
 - Presented results of research in scientific journals and at national conferences
 - Performed as the safety manager (training record maintenance, conducted site-specific and personal protective equipment training, assisted with safety audits)

PROFESSIONAL EXPERIENCE

- Authorized International Lead Auditor** 2009-2011
Control Union Inspections (Pvt) Ltd., Sri Lanka
- Lead auditor in ISO:9001 Quality Management Systems and Forest Stewardship Council (FSC) Forest Management (FM) and Chain of Custody (COC) certification
 - Formulated National FSC FM/COC Standards for Sri Lanka

- Conducted audits in sustainable management of forests and forest products (Sri Lanka, India, Thailand, Netherland, Belgium)

TECHNIQUES AND SKILLS

Ultra performance liquid chromatography time-of-flight high-resolution mass spectrometry (UPLC-ToF MS/MS), Hydrophilic interaction liquid chromatography triple quadrupole mass spectrometry (HILIC-TQD-MS), Chemical ionization mass spectrometry (CIMS), Gas chromatography mass spectrometry (GC-MS), High performance liquid chromatography pulsed amperometry (HPLC-PAD), Ion chromatography (IC), Inductively coupled plasma mass spectrometry (ICP-MS), Gas chromatography flame ionization detection (GC-FID), Scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM-EDX), Ultraviolet-visible spectroscopy (UV-Vis), Total organic carbon analyzer (TOC), Extensive knowledge in method development, Well experienced in field and laboratory sample collection, Excellent skills in sample extraction techniques (SPE, solvent phase), Excellent skills in quality control procedures, system management and SOP formulation, Excellent knowledge in laboratory safety, training, record maintenance and audits, Excellent knowledge in Microsoft Office software, analytical software (ChemStation, Chromeleon, Peakview), graphing software (SigmaPlot) and statistical analysis software (Minitab)

AWARDS

Lynn Anderson Award for Research Excellence	2017
Ballard Seashore Graduate Dissertation Fellowship	2016
Center for Aerosol Impacts on Climate and the Environment (CAICE) Outstanding Achievement in Leadership and Outreach Award	2016
Foo Tsai Graduate Fellowship	2015
T. Anne Cleary International Dissertation Research Fellowship	2014
Center for Global and Regional Environmental Research (CGRER) Graduate Student Travel Award for Field Research	2014

AFFILIATIONS

American Chemical Society (ACS)	2016
American Geophysical Union (AGU)	2016

RESEARCH INTERESTS

Analytical chemistry, Separation science, Environmental science, Method development

PUBLICATIONS

Published and in Press

1. **Jayarathne, T.;** Stockwell, C.; Gilbert, A.; Daugherty, K.; Cochrane, M.; Ryan, K.; Putra, E.; Saharjo, B.; Nurhayati, A.; Albar, I.; Yokelson, R.; Stone, E.; "Chemical Characterization of Fine Particulate Matter Emitted by Peat Fires in Central Kalimantan, Indonesia During the 2015 El Niño." *Atmospheric Chemistry and Physics*, 2018, 18, 2585-2600. doi.org/10.5194/acp-18-2585-2018.

2. **Jayarathne, T.**; Stockwell, C.; Christian, T.; Bhawe, P.; Rathnayake, C.; Islam, R.; Praveen, P.; Panday, A.; Adhikari, S.; Maharjan, R.; Goetz, J.; DeCarlo, P.; Saikawa, E.; Yokelson, R.; Stone, E.; "Nepal Ambient Monitoring and Source Testing Experiment (NAMaSTE): Emissions of Particulate Matter from Wood- and Dung-fueled Cooking Fires, Garbage and Crop Residue Burning, Brick Kilns, and Other Sources." *Atmospheric Chemistry and Physics*, 2018, 18, 2259-2286. doi.org/10.5194/acp-18-2259-2018.
3. Hettiyadura, A.; **Jayarathne, T.**; Baumann, K.; Goldstein, A.; de Gouw, J.; Koss, A.; Keutsch, F.; Skog, K.; Stone, E.; "Qualitative and Quantitative Analysis of Atmospheric Organosulfates in Centreville, Alabama." *Atmospheric Chemistry and Physics*, 2017, 17 (2), 1343-1359. doi:10.5194/acp-17-1343-2017.
4. Rathnayake, C.; Metwali, N.; **Jayarathne, T.**; Kettler, J.; Huang, Y.; Thorne, P.; O'Shaughnessy, P.; Stone, E.; "Influence of Rain on the Abundance and Size Distribution of Bioaerosols" *Atmospheric Chemistry and Physics*, 2017, 17, 2459-2475. doi:10.5194/acp-17-2459-2017.
5. Cochran, R.; Laskina, O.; Trueblood, J.; Estillore, A.; Morris, H.; **Jayarathne, T.**; Sultana, C.; Lee, C.; Lin, P.; Laskin, J.; Laskin, A.; Dowling, J.; Qin, Z.; Cappa, C.; Bertram, T.; Tivanski, A.; Stone, E.; Prather, K.; Grassian, V.; "Molecular Diversity of Sea Spray Particles: Impact of Ocean Biology on Particle Composition and Hygroscopicity" *Chem*, 2017, 2, 655-667. doi:10.1016/j.chempr.2017.03.007.
6. Pokhrel, R.; Beamesderfer, E.; Wagner, N.; Langridge, J.; Lack, D.; **Jayarathne, T.**; Stone, E.; Stockwell, C.; Yokelson, R.; Murphy, S.; "Relative Importance of Black Carbon, Brown Carbon and Absorption Enhancement from Clear Coatings in Biomass Burning Emissions." *Atmospheric Chemistry and Physics*, 2017, 17, 5063-5078. doi:10.5194/acp-17-5063-2017.
7. McCluskey, C.; Hill, T.; Malfatti, F.; Sultana, C.; Lee, C.; Santander, M.; Beall, C.; Moore, K.; Cornwell, G.; Collins, D.; Prather, K.; **Jayarathne, T.**; Stone, E.; Kreidenweis, S.; Paul J. DeMott, P.; "A Dynamic Link Between Ice Nucleating Particles Released with Nascent Sea Spray Aerosol and Oceanic Biological Activity Expressed During Two Mesocosm Experiments" *Journal of the Atmospheric Sciences*, 2017, 74.1, 151-166. doi:10.1175/JAS-D-16-0087.1
8. **Jayarathne, T.**; Sultana, C.; Lee, C.; Malfatti, F.; Cox, J.; Pendergraft, M.; Moore, K.; Azam, F.; Tivanski, A.; Cappa, C.; Bertram, T.; Grassian, V.; Prather, K.; Stone, E.; "Enrichment of Saccharides and Divalent Cations in Sea Spray Aerosol During Two Phytoplankton Blooms." *Environmental Science and Technology*, 2016, 50 (21), 11511-11520. doi:10.1021/acs.est.6b02988.
9. **Jayarathne, T.**; Rathnayake, C.; Stone, E.; "Local Source Impacts on Primary and Secondary Aerosols in the Midwestern United States." *Atmospheric Environment*, 2016, 130, 74-83. doi: 10.1016/j.atmosenv.2015.09.058.
10. Stockwell, C.; **Jayarathne, T.**; Cochrane, M.; Ryan, K.; Putra, E.; Saharjo, B.; Nurhayati, A.; Albar, I.; Blake, D.; Simpson, I.; Stone, E.; Yokelson, R.; "Field Measurements of Trace Gases and Aerosols Emitted by Peat Fires in Central Kalimantan, Indonesia During the 2015 El Niño." *Atmospheric Chemistry and Physics*, 2016, 16, 11711-11732. doi:10.5194/acp-16-11711-2016.
11. Cochran, R.; **Jayarathne, T.**; Stone, E.; Grassian, V.; "Selectivity Across the Interface: A Test of Surface Activity in the Composition of Organic-Enriched Aerosols from Bubble Bursting." *The Journal of Physical Chemistry Letters*, 2016, 7(9), 1692-1696. doi: 10.1021/acs.jpcllett.6b00489.
12. Cochran, R.; Laskina, O.; **Jayarathne, T.**; Laskin, A.; Laskin, J.; Lin, P.; Sultana, C.; Lee, C.; Moore, K.; Cappa, C.; Bertram, T.; Prather, K.; Grassian, V.; Stone, E.; "Analysis of

Organic Anionic Surfactants in Fine (PM_{2.5}) and Coarse (PM₁₀) Fractions of Freshly Emitted Sea Spray Aerosol." *Environmental Science and Technology*, 2016, 50, 2477-2486. doi: 10.1021/acs.est.5b04053.

13. Adams, E.; Verreault, D.; **Jayarathne, T.**; Cochran, R.; Stone, E.; Allen, H.; "Surface Organization of a DPPC Monolayer on Concentrated SrCl₂ and ZnCl₂ Solutions." *Physical Chemistry Chemical Physics*, 2016, 18.47, 32345-32357. doi: 10.1039/C6CP06887A
14. Stockwell, C.; Christian, T.; Goetz, J.; **Jayarathne, T.**; Bhave, P.; Adhikari, S.; Puppala, S.; Maharjan, R.; DeCarlo, P.; Stone, E.; Saikawa, E.; Blake, D.; Yokelson, R.; Panday, A.; "Nepal Ambient Monitoring And Source Testing Experiment (NAMaSTE): Emissions of Trace Gases and light-absorbing carbon from wood and dung cooking fires, garbage and crop residue burning, brick kilns, and other sources." *Atmospheric Chemistry and Physics*, 2016, 16, 11043-11081. doi:10.5194/acp-16-11043-2016.
15. Rathnayake, C.; Metwali, N.; Baker, Z.; **Jayarathne, T.**; Thorne, P.; O'Shaughnessy, P., Stone, E.; "Urban Enhancement of PM₁₀ Bioaerosols Relative to Background Locations in the Midwestern United States." *Journal of Geophysical Research: Atmospheres*, 2016, 121(9), 5071-5089. doi: 10.1002/2015JD024538.
16. Pokhrel, R.; Wagner, N.; Langridge, J.; Lack, D.; **Jayarathne, T.**; Stone, E.; Stockwell, C.; Yokelson, R.; Murphy, S.; "Parameterization of Single-scattering Albedo (SSA) and Absorption Ångström Exponent (AAE) with EC/OC for Aerosol Emissions from Biomass Burning." *Atmospheric Chemistry and Physics* 2016, 16, 9549-9561. doi: 10.5194/acp-16-9549-2016.
17. Levin, E.; McMeeking, G.; DeMott, P.; McCluskey, C.; Carrico, C.; Nakao, S.; **Jayarathne, T.**; Stone, E.; Stockwell, C.; Yokelson, R.; Kreidenweis, S.; "Ice Nucleating Particle Emissions from Biomass Combustion and the Potential Importance of Soot Aerosol." *Journal of Geophysical Research: Atmospheres*, 2016, 121(10), 5888-5903. doi: 10.1002/2016JD024879
18. Downard, D.; Singh, A.; Bullard, B.; **Jayarathne, T.**; Rathnayake, C.; Simmons, D.; Wels, B.; Spak, C.; Peters, T.; Beardsley, D.; Stanier, C.; Stone, E.; "Uncontrolled Combustion of Shredded Tires in a Landfill-Part 1: Characterization of Gaseous and Particulate Emissions." *Atmospheric Environment*, 2015, 104, 195-204. doi: 10.1016/j.atmosenv.2014.12.059.
19. **Jayarathne, T.**; Stockwell, C.; Yokelson, R.; Nakao, S.; Stone, E.; "Emissions of Fine Particle Fluoride from Biomass Burning." *Environmental Science and Technology*, 2014, 48, 12636-12644. doi: 10.1021/es502933.
20. Liu, S.; Aiken, A.; Arata, C.; Dubey, M.; Stockwell, C.; Yokelson, R.; Stone, E.; **Jayarathne, T.**; Robinson, A.; DeMott, P.; Kreidenweis, S.; "Aerosol Single Scattering Albedo Dependence on Biomass Combustion Efficiency: Laboratory and Field Studies." *Geophysical Research Letters*, 2014, 41, 742-748. doi: 10.1002/2013GL058392.
21. Subasinghe, S.; **Jayarathne, T.**; "Evaluation of Growth and Management of Teak (*Tectona grandis* L.F.) Established in Farmer Woodlots in Dry and Intermediate Zones of Sri Lanka." *Sri Lanka Forester*, 2012, 34, 37-50.

In Preparation

22. Deane, G.; Cochran, R.; **Jayarathne, T.**; Stokes, M.; Forestieri, S.; Sultana, C.; Lee, C.; Morris, H.; Ray, K.; Lee, H.; Tivanski, A.; Bertram, T.; Prather, K.; Grassian, V.; Cappa, C.; Stone, E. "A mechanistic model for the size-dependent transfer of organic matter to sea spray aerosol" *in preparation for Science*.
23. **Jayarathne, T.**; Cappa, C.; Bertram, T.; Grassian, V.; Prather, K.; Stone, E.; "Enrichment of Saccharides and Metal Ions at Air-Water Interface: A Quantitative Comparison of Sea

Surface Microlayer and Foam." *In preparation for Environmental Science and Technology Letters.*

24. **Jayarathne, T.**; Stockwell, C.; Dolan, M.; Engling, G.; Yokelson, R.; Stone, E.; "Chemical Characterization of Biomass Burning Smoke from Conifers, Grasses, Crop Residue, Peat and Cooking Fires." *In preparation for Atmospheric Environment.*
25. Hettiyadura, A.; **Jayarathne, T.**; Stone, E.; "Sources of Fine Particulate Organic Carbon at Centreville, Alabama during Summer 2013 by Molecular Tracer-based Positive Matrix Factorization." *In preparation for Atmospheric Environment.*
26. Islam, Md.; **Jayarathne, T.**; Gilbert, A.; Rupakheti, M.; Stone, E. "Molecular markers for source identification and apportionment of ambient aerosol in Kathmandu, Nepal" *In preparation for Atmospheric Chemistry and Physics.*
27. Goetz, J.; Giordano, M.; Stockwell, C.; Christian, T.; Maharjan, R.; Adhikari, S.; Bhave, P.; Praveen, P.; Panday, A.; **Jayarathne, T.**; Stone E.; Yokelson, R.; DeCarlo, P.; "Speciated On-line PM₁ from South Asian Combustion Sources: Part I, Fuel-based Emission Factors and Size Distributions." *In preparation for Atmospheric Chemistry and Physics.*

Undergraduate Honors Thesis

28. Gilbert, A.; **Jayarathne, T.**; Stone, E.; "Chemical Analysis and Source Identification of Particulate Matter in Kathmandu, Nepal", 2016, University of Iowa.
29. Daugherty, K.; **Jayarathne, T.**; Stone, E.; "Emission of Water-soluble Organic Carbon from Biomass Burning Sources in Kathmandu, Nepal", 2017, University of Iowa.

PRESENTATIONS

- **Jayarathne, T.**; Stockwell, C.; Gilbert, A.; Daugherty, K.; Cochrane, M.; Ryan, K.; Putra, E.; Saharjo, B.; Nurhayati, A.; Albar, I.; Yokelson, R.; Stone, E.; "Chemical Characterization of Fine Particulate Matter Emitted by Peat Fires in Central Kalimantan, Indonesia During the 2015 El Niño." Iowa Academy of Science, 129th Annual Meeting, Cedar Falls, Iowa, 2017. (poster)
- **Jayarathne, T.**; Stockwell, C.; Gilbert, A.; Daugherty, K.; Cochrane, M.; Ryan, K.; Putra, E.; Saharjo, B.; Nurhayati, A.; Albar, I.; Yokelson, R.; Stone, E.; "Chemical Characterization of Fine Particulate Matter Emitted by Peat Fires in Central Kalimantan, Indonesia During the 2015 El Niño." The 19th Annual James F. Jakobsen Graduate Conference, Iowa City, Iowa, 2017.
- **Jayarathne, T.**; Stockwell, C.; Christian, T.; Bhave, P.; Rathnayake, C.; Islam, R.; Praveen, P.; Panday, A.; Adhikari, S.; Maharjan, R.; Goetz, J.; DeCarlo, P.; Saikawa, E.; Yokelson, R.; Stone E.; "Nepal Ambient Monitoring and Source Testing Experiment (NAMaSTE): Emissions of Particulate Matter from Wood and Dung Cooking Fires, Brick Kilns, Generators, Trash and Crop Residue Burning." American Geophysical Union (AGU) fall meeting, San Francisco, California, 2016. (poster)
- **Jayarathne, T.**; Moore, K.; Malfatti, F.; Cox, J.; Pendergraft, M.; Sultana, C.; Lee, C.; Bertram, T.; Cappa, C.; Tivanski, A.; Grassian, V.; Azam, F.; Prather, K.; Stone, E.; "Enrichment of Saccharides and Salts in Sea Spray Aerosol" CAICE annual meeting, Sanford Consortium, University of California, San Diego, California, 2016. (poster)
- **Jayarathne, T.**; Stone, E.; "Assessment of Saccharide Enrichment in Different Compartments of the Ocean Using Anion-Exchange Chromatography." American Chemical Society (ACS) spring meeting, San Diego, California, 2016. (poster)
- **Jayarathne, T.**; Moore, K.; Malfatti, F.; Sultana, C.; Lee, C.; Bertram, T.; Cappa, C.; Tivanski, A.; Grassian, V.; Azam, F.; Prather, K.; Stone, E.; "Quantitative Transfer of

- Organic species Across the Air-water Interface." CAICE annual meeting, Scripps Institute of Oceanography, University of California, San Diego, California, 2014. (poster)
- **Jayarathne, T.;** "The Sweet Side of the Ocean: Enrichment of Saccharides in Sea Spray Aerosol." Analytical Seminar, Department of Chemistry, 2015.
 - **Jayarathne, T.;** Stockwell, C.; Yokelson, R.; Nakao, S.; Stone, E.; "Quantification of Particulate Fluoride in the Biomass Burning Aerosol." The 16th Annual James F. Jakobsen Graduate Conference, Iowa City, Iowa, 2014.
 - **Jayarathne, T.;** Stone E.; "Chemical Composition of Atmospheric Aerosols in Iowa City." American Geophysical Union (AGU) fall meeting, San Francisco, California, 2013. (poster)
 - **Jayarathne, T.;** Stone E.; "Chemical Composition of Atmospheric Aerosols in Iowa City." 15th Annual James F. Jakobsen Graduate Conference, Iowa City, Iowa. 2013 (poster)
 - **Jayarathne, T.;** Stone E.; "Chemical Composition of Atmospheric Aerosols in Iowa City." Iowa Academy of Science, 125th Annual Meeting, Simpson City, Iowa, 2013.
 - **Jayarathne, T.;** "Use of Scanning Electron Microscopy (SEM) Coupled with Energy Dispersive X-ray (EDX) Microanalysis in Aerosol Analysis." Analytical Seminar, Department of Chemistry, 2012.
 - **Jayarathne, T.;** "Determination of Parabens in Cosmetic Products Using Solid Phase Extraction and Corona-Charged Aerosol Detection System." Analytical Seminar, Department of Chemistry, 2012.