

Yeongkwon Son, Ph.D

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 Organic Analytical Laboratory
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(a) Professional Preparation

Rutgers University, NJ, USA	Public Health	Ph.D.	2018
Konkuk University, Seoul, South Korea	Environmental science	Ph.D.	2012
Konkuk University, Seoul, South Korea	Rural engineering	B.S.	2007

(b) Appointments

Graduate Faculty	Atmospheric Sciences Program University of Nevada, Reno, NV, USA	Mar 2020-Present
Assistant Research Professor	Desert Research Institute, NV, USA	Aug 2019-Present
Postdoctoral Fellow	Desert Research Institute, NV, USA	Jan 2018-Aug 2019

(c) Courses Taught

Data analysis with Python for atmospheric scientists (UNR ATMS 792)	2020-Present
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(d) Funded Projects

“Natural” and “organic”: cigarette descriptors: association with expectancies, subjective effects, topography, and biomarkers of exposure among daily smokers. PI (subaward), NIH, \$458,574	2021-2024
Multi-parameter Investigation of Factors Controlling Carbonyl Emissions from Electronic Cigarettes. Co-PI, NIH, \$1,415,510	2021-2024
An Integrative Approach for Estimating Children's Soil and Dust Ingestion Rates, PI (subaward), EPA, \$689,433	2021-2024
Development, Implementation and Evaluation of Stakeholder-Driven Wildfire Smoke Monitoring and Messaging in Rural Nevada, Co-PI, EPA, \$544,763	2021-2023
Informing the Management of Hot Springs in the Black Rock Desert-High Rock Canyon National Conservation Area: Microplastics, PFAS, and Aqueous geochemistry, Co-PI, DOI, \$30,491	2021-2022
Occurrence and Mass Balance of PFAS during Wastewater Treatment, Co-PI, USGS, \$106,930	2020-2021
Per- and polyfluoroalkyl substances (PFAS) in the southern Nevada watershed, Co-PI, MAKI Foundation, \$79,980	2019-2021
Development of a High-Throughput Electronic Cigarette Testing System, PI, Desert Research Foundation, \$34,882	2018-2019
Developing Analytical Methods for Nicotine Metabolites to Study Health Effects Associated with Electronic Cigarette Use, PI, DRI, \$10,257	2018-2019

(e) Publications

Peer-reviewed Journal Articles

23. **Son, Y.** and Khlystov, A. (2021) An Automated Aerosol Collection and Extraction System to Characterize Electronic Cigarette Aerosols. *Frontiers in Chemistry*, 9:764730 (IF: 5.221)
22. Zhang, T., Bhattarai, C., **Son, Y.**, Samburova, V., Khlystov, A., & Varganov, S. (2021) Reaction Mechanisms of Anisole Pyrolysis at Different Temperatures: Experimental and Theoretical Studies, *Energy & Fuels*, 35 (12), 9994–10008 (IF: 3.421)
21. Bai, X., & **Son, Y.** (2021). Perfluoroalkyl substances (PFAS) in surface water and sediments from two urban watersheds in Nevada, USA. *Science of The Total Environment*, 751, 141622. (IF: 7.963)
20. **Son, Y.**, Weisel, C., Wackowski, O., Schwander, S., Delnevo, C., & Meng, Q. (2020). The Impact of Device Settings, Use Patterns, and Flavorings on Carbonyl Emissions from Electronic Cigarettes. *International journal of environmental research and public health*, 17(16), 5650. (IF: 3.390)
19. **Son, Y.**, Giovenco, D. P., Delnevo, C., Khlystov, A., Samburova, V., & Meng, Q. (2020). Indoor Air Quality and Passive E-cigarette Aerosol Exposures in Vape-shops. *Nicotine & Tobacco Research*, ntaa094. (IF: 3.786)
18. Ebersole, J., Samburova, V., **Son, Y.**, Cappelli, D., Demopoulos, C., Capurro, A., Pinto, A., Chrzan, B., Kingsley, K., Howard, K. and Clark, N. (2020). Harmful chemicals emitted from electronic cigarettes and potential deleterious effects in the oral cavity. *Tobacco Induced Diseases*, 18. (IF: 2.092)
17. **Son, Y.**, Bhattarai, C., Samburova, V., & Khlystov, A. (2020). Carbonyls and Carbon Monoxide Emissions from Electronic Cigarettes Affected by Device Type and Use Patterns. *International journal of environmental research and public health*, 17(8), 2767. (IF: 3.390)
16. **Son, Y.**, Mainelis, G., Delnevo, C., Wackowski, O. A., Schwander, S., & Meng, Q. (2019). Investigating E-Cigarette Particle Emissions and Human Airway Depositions under Various E-Cigarette-Use Conditions. *Chemical Research in Toxicology*, 33(2), 343-352. (IF: 3.278)
15. **Son, Y.**, Mishin, V., Laskin, J. D., Mainelis, G., Wackowski, O. A., Delnevo, C., Schwander, S., Samburova, V., Khlystov, A., Meng, Q. (2019). Hydroxyl Radicals in E-cigarette Vapor and E-vapor Oxidative Potentials under Different Vaping Patterns. *Chemical research in toxicology*, 32(6), 1087-1095. (IF: 3.278)
14. **Son, Y.**, Weisel, C., Wackowski, O., Mainelis, G., Schwander, S., Delnevo, C., Kipen, H., Meng, Q. (2018). Evaluation of e-vapor nicotine and nicotine concentrations emitted under various e-liquid compositions, device settings and vaping topographies. *Chemical Research in Toxicology*, 31(9), 861-868. (IF: 3.278)
13. Samburova, V., Bhattarai, C., Strickland, M., Darrow, L., Angermann, J.E., **Son, Y.**, Khlystov, A. (2018). Aldehydes in exhaled breath during e-cigarette vaping: results of a pilot study. *Toxics*, 6(3), 46. (IF: 3.531; Best Paper Award)
12. **Son, Y.**, Osornio-Vargas, Á. R., O'Neill, M. S., Hystad, P., Texcalac-Sangrador, J. L., Ohman-Strickland, P., Meng, Q., Schwander, S. (2018). Land use regression models to assess air pollution exposure in Mexico City using finer spatial and temporal input parameters. *Science of The Total Environment*, 639, 40-48. (IF: 7.963)
11. Yoon, C.G., Rhee, H.P. & **Son, Y.*** (2017). Applicability study of ecological impact assessment using AQUATOX model in Paldang Reservoir, South Korea. *Desalination and Water Treatment*, 60, 39-47. (IF: 1.15)
10. Meng, Q., Nagarajan, S., **Son, Y.**, Koutsoupias, P., & Bielory, L. (2016). Asthma, ocular symptoms, and skin test sensitivity across National Health and Nutrition Examination Surveys. *Annals of Allergy, Asthma & Immunology*, 116(2), 118-125.
9. Meng, Q., Schwander, S., **Son, Y.**, Rivas, C., Delnevo, C., Graber, J., Giovenco, D., Bruen, U. & Robson, M. (2016). Has the mist been peered through? Revisiting the building blocks of human health risk

assessment for electronic cigarette use. *Human and Ecological Risk Assessment: An International Journal*, 22(2), 558-579.

8. **Son, Y.**, Rhee, H. P., Yoon, C. G., & Kwon, T. Y. (2016). Feasibility study of ecological wastewater treatment system for decentralized rural community in South Korea. *Desalination and Water Treatment*, 57(44), 20766-20773.
7. Choi, J., Yoon, C. G., Rhee, H. P., **Son, Y.**, Cho, M., & Ryu, J. (2016). National risk assessment of irrigation on farmland near wastewater treatment plants in Korea. *Paddy and Water Environment*, 14(2), 281-288.
6. **Son, Y.**, Mishin, V., Welsh, W., Lu, S. E., Laskin, J. D., Kipen, H., & Meng, Q. (2015). A Novel High-Throughput Approach to Measure Hydroxyl Radicals Induced by Airborne Particulate Matter. *International journal of environmental research and public health*, 12(11), 13678-13695.
5. **Son, Y.K.**, Yoon, C.G., Rhee, H.P., & Lee, S.J. (2013). A review on microbial and toxic risk analysis procedure for reclaimed wastewater irrigation on paddy rice field proposed for South Korea. *Paddy and Water Environment*, 11(1-4), 543-550.
4. Rhee, H.P., Yoon, C.G., Lee, S.J., Choi, J.H., & **Son, Y.K.** (2012). Analysis of nonpoint source pollution runoff from urban land uses in South Korea. *Environmental Engineering Research*, 17(1), 47-56.
3. Rhee, H.P., Yoon, C.G., **Son, Y.K.**, & Jang, J.H. (2011). Quantitative risk assessment for reclaimed wastewater irrigation on paddy rice field in Korea. *Paddy and Water Environment*, 9(2), 183-191.
2. **Son, Y.K.**, Yoon, C.G., Kim, H.C., Jang, J.H., & Lee, S.B. (2010). Determination of regression model parameter for constructed wetland using operating data. *Paddy and Water Environment*, 8(4), 325-332.
1. Kim, H.C., Yoon, C.G., **Son, Y.K.**, Rhee, H.P., & Lee, S.B. (2010). Effects of open water on the performance of a constructed wetland for nonpoint source pollution control. *Water Science and Technology*, 62(5), 1003-1012.

Conference Proceedings

18. **Son, Y.** and Cho, J. (2021) Current Trends in Air Quality Forecasting using a Machine Learning Technique, ICT-Advanced Engineering Society, International Conference on Advanced Engineering and ICT-Convergence: Seoul, Korea, July 7, 2021-July 9, 2021
17. **Son, Y.**, Carranza, C., Torres, M., Black, K., Jones, L., Meng, Q., Osornio-Vargas, A., Schwander, S. (2021) Association Between Particle Load in Alveolar Macrophages and Air Pollution Particulate Matter Exposures in México City, A3175-A3175, American Thoracic Society, May 15, 2021-May 19, 2021
16. **Son, Y.**, Khlystov, A. Y., Samburova, V. (2020) Pilot Study on The Nicotine Metabolite Ratio Among Electronic Cigarette Users, Society For Research On Nicotine and Tobacco 26th annual meeting: New Orleans, Louisiana, March 11, 2020-March 14, 2020, Poster No. PS5-155
15. **Son, Y.** and Ryu, J. (2019) Development of low-cost autonomous air quality sensing platform to access health impacts associated with wildfire events. *Proceedings of Nevada Public Health Association annual conference*, Reno, NV, USA
14. **Son, Y.**, Bhattarai, C., Samburova, V., and Khlystov, A. (2019). Impact of Vaping Patterns on Carbonyls and Carbon Monoxide Emissions from Four Popular Types of Electronic Cigarettes. *Proceedings of Society of Research on Nicotine & Tobacco annual meeting*, San Francisco, CA, USA
13. **Son, Y.**, Khlystov, A., Samburova, V., Al-Shujairi, A., Giovenco, D., Delnevo, C., and Meng, Q. (2019) Passive Nicotine Exposures in Electronic Cigarette Vape Shops in New Jersey, USA. *Proceedings of Society of Research on Nicotine & Tobacco annual meeting*, San Francisco, CA, USA
12. **Son, Y.**, Bhattarai, C., Samburova, V., Meng, Q., Wackowski, A., Delnevo, C., and Khlystov, A. (2019). Estimating the Human Health Risks Induced by Harmful Chemical Exposures from Four Types Electronic Cigarettes. *Proceedings of Society of Research on Nicotine & Tobacco annual meeting*, San Francisco, CA, USA

11. Khlystov, A., **Son, Y.**, Samburova, V., and Bhattarai, C. (2019). Characterization of nicotine, aldehyde, and carbon monoxide emissions from four types of electronic cigarette devices. Proceedings of American Chemical Society annual meeting, Orlando, FL, USA
10. **Son, Y.**, Samburova, V., and Khlystov, A. (2018). Carbon Monoxide and Carbonyl Emissions from Four Popular E-cigarettes. Proceedings of Nevada Public Health Association annual meeting, Las Vegas, NV, USA
9. Samburova, V., **Son, Y.**, Bhattarai, C., Strickland, M., Darrow, L., Angermann, J.E., and Khlystov, A. (2018). Aldehydes in exhaled breath during e-cigarette vaping: results of a pilot study. Invited Speaker at Nevada Tobacco Prevention Coalition Regular Meeting
8. Pearson, J.L., Crabtree, M.B., Maloney, S.F., Hiler, M., Spindle, T., Kilgalen, B., Nareg, K., **Son, Y.**, Samburova, V., Khlystov, K., Eissenberg, T. (2018) A comparison of e-cigarette nicotine aerosol content vs blood nicotine concentrations: Markten vs. e-Go T. Proceedings of Tobacco Regulatory Science annual conference
7. Al-Shujairi, A., **Son, Y.**, Meng, Q., Giovenco, D., Delnevo, C. (2018) Indoor Air Quality in Electronic Cigarette Vape Shops. Proceedings of Society of Research on Nicotine & Tobacco annual meeting, Baltimore, MD, USA, POS5-5
6. **Son, Y.**, Osornio-Vargas, A. R., O'Neill, M., Texcalac-Sangrador, J. L., Ohman-Strickland, P. A., Meng, Q., Torres, M. & Schwander, S. (2017) A Novel Land Use Regression Model to Assess Air Pollution Exposure for Tuberculosis Research in Mexico City Using Finer Spatial and Temporal Input Parameters. Proceedings of American Thoracic Society International Conference, Washington DC, USA. American Journal of Respiratory and Critical Care Medicine, 195:A3908.
5. Meng, Q., **Son, Y.**, Kipen, H., Laskin, D., Schwander, S., Delnevo, C. (2017) Particles Released from Primary E-Cigarette Vaping: Particle Size Distribution and Particle Deposition in the Human Respiratory Tract. Proceedings of American Thoracic Society International Conference, Washington DC, USA. American Journal of Respiratory and Critical Care Medicine, 195:A1023.
4. **Son Y.K.**, C.G. Yoon, H.C. Kim, J.H. Jang. (2009) Development of Regression and Design Model for Constructed Wetland System using Performance Data. Proceedings of 13th international conference on diffuse pollution and integrated watershed management, Seoul, Korea, pp 27-28
3. **Son Y.K.**, C.G. Yoon, H.P. Rhee, H.C. Kim. (2009) A Health-risk Analysis Procedure for Reclaimed Wastewater Irrigation in Paddy Rice Field. Proceedings of 7th IWA World Congress on Water Reclamation and Reuse, Brisbane, Australia, pp. 87
2. **Son Y.K.**, C.G. Yoon, J.H. Jeon, J.H. Jang. (2008) Effect of Subwatershed Size on the BOD Loading Estimate in Hydrological Simulation Program-Fortran Simulation. Proceedings of 12th international conference on integrated diffuse pollution management, Khon Kaen, Thailand
1. **Son Y.K.**, C.G. Yoon, T.Y. Kwun, J.W. Son. (2008) The Performance and Analysis of Natural and Ecological Wastewater Treatment System. Proceedings of 1st Asia-Pacific young water professional conference, Gwangju, Korea, pp71-72

(f) Technical Reports/Book Chapters

2. Wang, X., Firouzkouhi, H., Claassen, M., Bingham, B., Gronstal, S. B., Kohl, S. D., Rhode, D. E., **Son, Y.**, Chow, J. C., Watson, J. G., Kumar, N., 2020: Virus Transport and Mitigation in Offices and Classrooms, Desert Research Institute: Reno, NV, Prepared for Nevada Governor's Office of Economic Development
1. Wang, X., Firouzkouhi, H., Claassen, M., Bingham, B., Gronstal, S. B., Kohl, S. D., Rhode, D. E., **Son, Y.**, Moosmüller, H., Chow, J. C., Watson, J. G., Kumar, N., 2020: Virus Transport and Mitigation in Public Transit Buses, Desert Research Institute: Reno, NV, Prepared for Nevada Governor's Office of Economic Development

(g) Professional Organizations

International Society of Exposure Science
Society for Research on Nicotine & Tobacco
Society of Environmental Toxicology and Chemistry
Korean-American Scientists and Engineers Association
Korea Engineering and Consulting Association

(h) Professional Service

- Faculty senate, Desert Research Institute, 2021-Present
- Early Career Faculty committee, Desert Research Institute, 2021-Present
- Curriculum committee, Atmospheric Sciences program, University of Nevada, Reno, 2021-Present
- Topic Editor of Atmosphere (ISSN 2073-4433; CODEN: ATMOCZ), 2020-Present
- Guest Editor of Toxics (ISSN 2305-6304; CODEN: TOXIC8), Special Issue entitled "Speciation, Characterization, and Quantitative Analysis of Toxic Organic Species in Indoor Air."
- Ad-hoc reviewer for 21 peer-review journals

(i) Undergraduate/Graduate MentorshipUndergraduate Supervisor

Mathew J Thomas, UNR School of Medicine, 2021-Present

Graduate Advising Committee

Camilo Andres Pena Bello, UNR College of Agriculture, Biotechnology & Natural Resources, PhD student, Expected to graduate in 2024