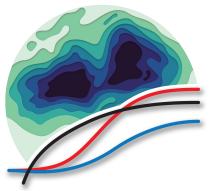
Kyle P Messier

530 Davis Dr.
Durham, NC 27713
✉ kyle.messier@nih.gov
homepage
GitHub
Updated January 5, 2024



Summary

Dr. Kyle P Messier is a Stadtman tenure-track investigator with a primary appointment in the Division of Translational Toxicology, Predictive Toxicology Branch, and the lead of the Spatiotemporal Exposures and Toxicology Group, $\{SET\}_{group}$. Messier's expertise is methodological development and application of spatial statistics in environmental health sciences. SET Group's research focus is on environmental exposure assessments and mechanistically-informed mixture risk assessments using spatiotemporal statistics.

Education

2011-2015 **PhD**, *University of North Carolina at Chapel Hill*, Environmental Science and Engineering.

2008-2010 **MS**, *University of North Carolina at Chapel Hill*, Environmental Science and Engineering.

2003-2007 **BS**, *University of North Carolina at Asheville*, Environmental Studies.

Experience

2020 - **Stadtman Tenure-Track Investigator**, *National Institute of Environmental Health Sciences*, Durham, NC.
Division of Translational Toxicology (Formerly the Division of the National Toxicology Program)

2020 - **Adjunct Investigator**, *National Institute on Minority Health and Health Disparities*, Bethesda, MD.
Division of Intramural Research

2020 - **Secondary Appointment**, *National Institute of Environmental Health Sciences*, Durham, NC.
Biostatistics and Computational Biology Branch

2018 - 2020 **Research Assistant Professor**, *Oregon State University*, Corvallis, OR.
Department of Environmental and Molecular Toxicology

2015 - 2018 **Kravis Postdoctoral Fellow**, *University of Texas at Austin & Environmental Defense Fund*, Austin, TX.

2010 - 2015 **Geographic Information Systems and Statistical Analyst**, *US Environmental Protection Agency, Epidemiology Branch*, Chapel Hill, NC.

2008 - 2014 **Teaching Assistant**, *University of North Carolina at Chapel Hill*, Chapel Hill, NC.

Externally Funded Projects

- **Expanding Climate Change and Health (CCH) Data Infrastructure to Advance Health Interventions: Linking Health and Environmental Data to Improve Patient and Community Health** The Patient-Centered Outcomes Research Trust Fund $3,998,658.20, 03/01/2023 - 05/31/2026, *Project Co-Lead (Lead: Aubrey Miller, NIEHS SCOPE)*
- **Spatiotemporal Risk Assessment Modeling of Chemical Mixtures**, K99/R00, Pathway to Independence Award, National Institute of Environmental Health Sciences, $997,132, 08/01/2018 - 07/31/2023, *Principal Investigator (Mentor: Kim A Anderson), Award ended voluntarily due to intramural position at NIH.*

Trainees and Mentorship

Aug. 2023 - **Insang Song, PhD**, *Visiting Postdoctoral Fellow*, Spatial Disparity and Risk Assessment of combined socioeconomic, environmental, and climate factors.

Aug. 2023 - **Mariana Alifa Kassien, PhD**, *IRTA Postdoctoral Fellow*, High-Throughput Exposure Mapping using Physics-Informed Neural Networks.

Jul. 2023 - **Eva Marques, PhD**, *Visiting Postdoctoral Fellow*, High-Resolution Temperature and Humidity Mapping in North Carolina using Bayesian Hierarchical Models.

Jul. 2023 - **Ranadeep Daw, PhD**, *Visiting Postdoctoral Fellow*, Extremely Random Spatiotemporal Boosted Models: Gapfilling Satellite Observation Air Pollution Data.

Jul. 2023 - **Mitchell Manware, MS**, *Research Data Analyst*, Climate Change and Health Data Analysis and Educational Vignette Development.

Sept. 2021 - **Daniel Zilber, PhD**, *IRTA Postdoctoral Fellow*, Bayesian Hierarchical Models to Solve Mixtures Prediction with Dirichlet Processes and Generalized Concentration Addition.

Nov. 2021 - Nov. 2023 **Lara P Clark, PhD**, *NIH Data Scholar, co-advising with Dr. Charles Schmitt (NIEHS ODS)*, Lowering the burden of integrating geospatial data into epidemiological studies through the development of geospatial data standards and open-source code.

Nov. 2020 - May. 2023 **Kristin M Eccles, PhD**, *Visiting Postdoctoral Fellow*, A geospatial modeling approach to quantifying the risk of exposure to environmental chemical mixtures via a common molecular initiating event.

Aug. 2020 - May 2022 **Melissa E Lowe, MS**, *IRTA Post-baccalaureate Fellow*, GIS analyst for the Personalized Environment and Gene Study; Air pollution mixtures and causal relationships with skin autoimmune disorders.

Sept. 2020 - May 2022 **Taylor A Potter, BS**, *IRTA Post-baccalaureate Fellow*, GIS and statistical training; Flood risk and health outcomes using the Personalized Gene and Environment Study.

June 2021 - Aug. 2021 **Alvin Sheng, BA**, *NIH Summer Intern*, Effects of flood risk and climate change on census-tract Level health outcomes.

Refereed Publications

34. Alvin Sheng, Brian J Reich, and **Kyle P Messier**. "Associations between Flood Risk and United States Census Tract-Level Health Outcomes". In: *American Journal of Epidemiology* in press (2023)

33. Melissa E Lowe, Farida S Akhtari, Taylor A Potter, David C Fargo, Charles P Schmitt, Shepherd H Schurman, Kristin M Eccles, Alison Motsinger-Reif, Janet E Hall, and **Kyle P Messier**. "The skin is no barrier to mixtures: Air pollutant mixtures and reported psoriasis or eczema in the Personalized Environment and Genes Study (PEGS)". in: *Journal of Exposure Science & Environmental Epidemiology* (2022), pp. 1–8

32. Kristin M Eccles, Agnes L Karmaus, Nicole C Kleinstreuer, Fred Parham, Cynthia V Rider, John F Wambaugh, and **Kyle P Messier**. "A geospatial modeling approach to quantifying the risk of exposure to environmental chemical mixtures via a common molecular target". In: *Science of The Total Environment* (2022), p. 158905

31. Ettie M Lipner, Joshua P French, Stephen Nelson, Joseph O Falkinham III, Rachel A Mercaldo, Rebekah A Blakney, Yihe G Daida, Timothy B Frankland, **Kyle P Messier**, Jennifer R Honda, et al. "Vanadium in groundwater aquifers increases the risk of MAC pulmonary infection in O'ahu, Hawai'i". In: *Environmental Epidemiology* 6.5 (2022), e220

30. Yuxia Cui, Kristin M Eccles, Richard K Kwok, Bonnie R Joubert, **Kyle P Messier**, and David M Balshaw. "Integrating Multiscale Geospatial Environmental Data into Large Population Health Studies: Challenges and Opportunities". In: *Toxics* (July 2022). ISSN: 2196-2995

29. Johanna R Jahnke, **Kyle P Messier**, Melissa Lowe, and Anne Marie Jukic. "Ambient Air Pollution Exposure Assessments in Fertility Studies: a Systematic Review and Guide for Reproductive Epidemiologists". In: *Current Epidemiology Reports* (May 2022). ISSN: 2196-2995

28. Sarah E. Chambliss, Carlos P.R. Pinon, **Kyle P Messier**, Brian LaFranchi, Crystal Romeo Upperman, Melissa M. Lunden, Allen L. Robinson, Julian D. Marshall, and Joshua S. Apte. "Local- and regional-scale racial and ethnic disparities in air pollution determined by long-term mobile monitoring". In: *Proceedings of the National Academy of Sciences* 118.37 (2021)

27. Shahzad Gani, Sarah E Chambliss, **Kyle P Messier**, Melissa M Lunden, and Joshua S Apte. "Spatiotemporal profiles of ultrafine particles differ from other traffic-related air pollutants: lessons from long-term measurements at fixed sites and mobile monitoring". In: *Environmental Science: Atmospheres* 1.7 (2021), pp. 558–568

26. Priyanka N deSouza, Phoebe Atsieno Oriama, Peter P Pedersen, Sebastian Horstmann, Lorena Gordillo-Dagallier, Charles N Christensen, Christoph O Franck, Richard Ayah, Ralph A Kahn, Jacqueline M Klopp, **Kyle P Messier**, and Patrick K Kinney. "Spatial variation of fine particulate matter levels in Nairobi before and during the COVID-19 curfew: implications for environmental justice". In: *Environmental Research Communications* 3.7 (2021), p. 071003

25. **Kyle P Messier** and Matthias Katzfuss. "Scalable penalized spatiotemporal land-use regression for ground-level nitrogen dioxide". In: *Annals of Applied Statistics* 15.2 (2021), pp. 688–710

24. Stephanie DeFlorio-Barker, Andrey Egorov, Genee S Smith, Mark S Murphy, Jason E Stout, Andrew J Ghio, Edward E Hudgens, **Kyle P Messier**, Jean-Marie Maillard, and Elizabeth D Hilborn. "Environmental risk factors associated with pulmonary isolation of nontuberculous mycobacteria, a population-based study in the southeastern United States". In: *Science of The Total Environment* 763 (2021), p. 144552

23. Sarah E Chambliss, Chelsea V Preble, Julien J Caubel, Troy Cados, **Kyle P Messier**, Ramón A Alvarez, Brian LaFranchi, Melissa Lunden, Julian D Marshall, Adam A Szpiro, et al. "Comparison of mobile and fixed-site black carbon measurements for high-resolution urban pollution mapping". In: *Environmental Science & Technology* 54.13 (2020), pp. 7848–7857

22. Andrew J Ghio, Genee S Smith, Stephanie DeFlorio-Barker, **Kyle P Messier**, Edward Hudgens, Mark S Murphy, Jean-Marie Maillard, Jason E Stout, and Elizabeth D Hilborn. "Application of diagnostic criteria for non-tuberculous mycobacterial disease to a case series of mycobacterial-positive isolates". In: *Journal of clinical tuberculosis and other mycobacterial diseases* 17 (2019), p. 100133

21. Ellis S Robinson, Rishabh U Shah, **Kyle P Messier**, Peishi Gu, Hugh Z Li, Joshua S Apte, Allen L Robinson, and Albert A Presto. "Land-Use Regression Modeling of Source-Resolved Fine Particulate Matter Components from Mobile Sampling". In: *Environmental Science and Technology* 53.15 (2019)

20. **Kyle P Messier**, Lane G Tidwell, Christine C Ghetu, Diana Rohlman, Richard P Scott, Lisa M Bramer, Holly M Dixon, Katrina M Waters, and Kim A Anderson. "Indoor versus outdoor air quality during wildfires". In: *Environmental science & technology letters* 6.12 (2019), pp. 696–701

19. Yawen Guan, Margaret C. Johnson, Matthias Katzfuss, Elizabeth Mannshardt, **Kyle P Messier**, Brian J Reich, and Joon J Song. "Fine-Scale Spatiotemporal Air Pollution Analysis Using Mobile Monitors on Google Street View Vehicles". In: *Journal of the American Statistical Association* 1459 (2019)

18. Riyana Ayub, **Kyle P Messier**, Marc L Serre, and Kumar Mahinthakumar. "Non-point source evaluation of groundwater nitrate contamination from agriculture under geologic uncertainty". In: *Stochastic Environmental Research and Risk Assessment* 33.4-6 (2019)

17. **Kyle P Messier**, David C Wheeler, Abigail R Flory, Rena R Jones, Deven Patel, Bernard T Nolan, and Mary H Ward. "Modeling groundwater nitrate exposure in private wells of North Carolina for the Agricultural Health Study". In: *Science of the Total Environment* 655 (2019)

16. George S Downward, Erik J.H.M. van Nunen, Jules Kerckhoffs, Paolo Vineis, Bert Brunekreef, Jolanda M.A. Boer, **Kyle P Messier**, Ananya Roy, W. Monique M. Verschuren, Yvonne T. van der Schouw, Ivonne Sluijs, John Gulliver, Gerard Hoek,

and Roel Vermeulen. "Long-Term Exposure to Ultrafine Particles and Incidence of Cardiovascular and Cerebrovascular Disease in a Prospective Study of a Dutch Cohort". In: *Environmental health perspectives* 126.12 (2018)

15. **Kyle P Messier**, Sarah E Chambliss, Shahzad Gani, Ramón Alvarez, Michael Brauer, Jonathan J Choi, Steven P Hamburg, Jules Kerckhoffs, Brian Lafranchi, Melissa M Lunden, Julian D Marshall, Christopher J Portier, Ananya Roy, Adam A Szpiro, Roel C.H. Vermeulen, and Joshua S Apte. "Mapping Air Pollution with Google Street View Cars: Efficient Approaches with Mobile Monitoring and Land Use Regression". In: *Environmental Science and Technology* 52.21 (2018)

14. David A Holcomb, **Kyle P Messier**, Marc L Serre, Jakob G Rowny, and Jill R Stewart. "Geostatistical Prediction of Microbial Water Quality Throughout a Stream Network Using Meteorology, Land Cover, and Spatiotemporal Autocorrelation". In: *Environmental Science and Technology* 52.14 (2018)

13. Stacey E. Alexeeff, Ananya Roy, Jun Shan, Xi Liu, **Kyle P Messier**, Joshua S. Apte, Christopher Portier, Stephen Sidney, and Stephen K. Van Den Eeden. "High-resolution mapping of traffic related air pollution with Google street view cars and incidence of cardiovascular events within neighborhoods in Oakland, CA". in: *Environmental Health* 17.1 (2018), pp. 1–13

12. Genee S Smith, **Kyle P Messier**, James L Crooks, Timothy J. Wade, Cynthia J Lin, and Elizabeth D Hilborn. "Extreme precipitation and emergency room visits for influenza in Massachusetts: A case-crossover analysis". In: *Environmental Health* 16.1 (2017)

11. Jules Kerckhoffs, Gerard Hoek, Jelle Vlaanderen, Erik van Nunen, **Kyle P Messier**, Bert Brunekreef, John Gulliver, and Roel Vermeulen. "Robustness of intra urban land-use regression models for ultrafine particles and black carbon based on mobile monitoring". In: *Environmental Research* 159 (2017), pp. 500–508

10. Joshua S Apte, **Kyle P Messier**, Shahzad Gani, Michael Brauer, Thomas W Kirchstetter, Melissa M Lunden, Julian D. Marshall, Christopher J Portier, Roel C.H. Vermeulen, and Steven P Hamburg. "High-Resolution Air Pollution Mapping with Google Street View Cars: Exploiting Big Data". In: *Environmental Science and Technology* 51.12 (2017)

9. **Kyle P Messier** and Marc L Serre. "Lung and stomach cancer associations with groundwater radon in North Carolina, USA". in: *International Journal of Epidemiology* 46.2 (2017), pp. 676–685

8. Jules Kerckhoffs, Gerard Hoek, **Kyle P Messier**, Bert Brunekreef, Kees Meliefste, Jochem O Klompmaker, and Roel Vermeulen. "Comparison of ultrafine particle and black carbon concentration predictions from a mobile and short-term stationary land-use regression model". In: *Environmental Science and Technology* 50.23 (2016)

7. Genee S Smith, Andrew J Ghio, Jason E Stout, **Kyle P Messier**, Edward E Hudgens, Mark S Murphy, Stacy L Pfaller, Jean-Marie Maillard, and Elizabeth D Hilborn. "Epidemiology of nontuberculous mycobacteria isolations among central North Carolina residents, 2006-2010". In: *Journal of Infection* 72.6 (2016)

6. **Kyle P Messier**, Ted Campbell, Phil Bradley, and Marc L Serre. "Estimation of Groundwater Radon in North Carolina using Land Use Regression and Bayesian Maximum Entropy". In: *Environmental science & technology* 49.16 (2015), pp. 9817–9825

5. Jyotsna S Jagai, Quanlin Li, Shiliang Wang, **Kyle P Messier**, Timothy J Wade, and Elizabeth D Hilborn. "Extreme precipitation and emergency room visits for gastrointestinal illness in areas with and without combined sewer systems: An analysis of Massachusetts data, 2003–2007". In: *Environmental Health Perspectives* 123.9 (2015)

4. **Kyle P Messier**, Evan Kane, Rick Bolich, and Marc L Serre. "Nitrate variability in groundwater of North Carolina using monitoring and private well data models". In: *Environmental Science and Technology* 48.18 (2014)

3. **Kyle P Messier**, Laura E Jackson, Jennifer L White, and Elizabeth D Hilborn. "Landscape risk factors for Lyme disease in the eastern broadleaf forest province of the Hudson River valley and the effect of explanatory data classification resolution". In: *Spatial and Spatio-temporal Epidemiology* 12 (2015)

2. **Kyle P Messier**, Yasuyuki Akita, and Marc L Serre. "Integrating address geocoding, land use regression, and spatiotemporal geostatistical estimation for groundwater tetrachloroethylene." In: *Environmental science & technology* 46.5 (Mar. 2012), pp. 2772–80

1. Alison P Sanders, **Kyle P Messier**, Mina Shehee, Kenneth Rudo, Marc L Serre, and Rebecca C Fry. "Arsenic in North Carolina: Public Health Implications". In: *Environment International* 38.1 (2012)

Technical Reports

- Lobdell, D.T., Jagai, J.S., Messer, L.C., Rappazzo, K., Grabich, S., Gray, C.L., **Messier, K.P.**, Smith, G.S., Pierson, S., Rosenbaum, B., Murphy, M.S. (2014) *Creating an overall environmental quality index, Technical Report.* United States Environmental Protection Agency, Office of Research and Development, Environmental Public Health Division, Epidemiology Branch, Chapel Hill, NC.

Invited Presentations

- GeoTox: Integrating Geospatial Exposure Modeling and Adverse Outcome Pathways Towards Mechanistically-Informed Risk Assessment *National Cancer Institute, Geographic Analysis Working Group Seminar Series* , Bethesda, MD (Virtual), January 11 2024
- Geostatistical Methods for Environmental Exposomics and Mechanistically-Informed Risk Assessment *National Institute on Minority Health and Health Disparities, Division of Intramural Research Seminar Series*, Bethesda, MD (Virtual), January 9 2024
- Advancing Spatiotemporal Methods for Large-Scale Environmental Exposure and Mechanistically-Informed Risk Assessment *Icahn School of Medicine at Mount Sinai, Department of Environmental Medicine and Public Health, Grand Rounds Lecture Series*, New York, NY, November 8 2023, (*Sponsored Travel*)

- Geospatial Modeling and Toxicology: A Growing Alliance for Mechanistically Informed Chemical Mixtures Risk Assessment *George Washington University, Department of Environmental and Occupational Health, Departmental Seminar Series*, Washington, DC, April 25 2023, (*Sponsored Travel Declined Due to Technical Constraints*)
- Geospatial Human Health Exposure Science Connections to Toxicology. *National Toxicology Program Board of Scientific Counselors*, Research Triangle Park, NC, June 17-18, 2019
- Associations of Groundwater Radon and Non-Lung Cancers: Current Understanding and Future Research. *Conference of Radiation Control Program Directors*, New Orleans, LA, Oct 4, 2017
- Spatial variability and stability of air quality data from mobile monitoring with Google Street View vehicles. *University of Utrecht, Institute for Risk Assessment Sciences*, Utrecht, Netherlands, Oct 14, 2016
- Nitrate variability in groundwater of North Carolina using monitoring and private well data models. *North Carolina Department of Environment and Natural Resources, Division of Water Resources*, Raleigh, NC, USA. November 21, 2014
- Integrating address geocoding, land use regression and spatiotemporal geostatistical estimation for groundwater PCE. *North Carolina GIS Conference*, February 8, 2013

Conference Publications

*Indicates trainee co-author

- Aubrey Miller, Ann Liu, Trisha Castranio, **Kyle P Messier**, Alison Motsinger-Reif, David Reif, David Fargo, and Charles Schmitt. "Building a data ecosystem to advance climate change and health research". In: *APHA 2023 Annual Meeting and Expo*. APHA. 2023
- Krishna, Shagun and Chang, Xiaoqing and *Eccles, Kristin M and **Messier, Kyle P** and Kleinstreuer, Nicole K, (2023, Aug. 27-31) *Risk-Based, Geospatially Informed Prioritization of Potentially Cardiotoxic Chemicals.* Poster Presentation at the 12th World Congress on Alternatives and Animal Use in the Life Sciences, WC12
- *Eccles, Kristin M and Karmaus, Agnes L and Kleinstreuer, Nicole C and Parham, Fred and Rider, Cynthia V and Wambaugh, John F and **Messier, Kyle P**, (2023, March) *Mapping a Path to Disease: Quantifying the risk of exposure to environmental chemical mixtures via a common molecular target using a geospatial modeling approach.* Oral Presentation at the annual meeting for the Society of Toxicology
- *Zilber, Daniel, **Messier, K.P.** (2023, March) *Bayesian Hierarchical Models to Solve Mixtures Prediction with Dirichlet Processes and Generalized Concentration Addition.* Poster Presentation at the annual meeting of the Society of Toxicology.
- **Messier, Kyle P**, Deepak Mav, Eric Bair, Ruchir R. Shah, Melissa E. Lowe, Myeongjong Kang, Matthias Katzfuss, and Matthew W. Wheeler (2022, December) *Interpretable and Scalable Spatiotemporal Gaussian Process Regression for Multivariate and Censored Environmental Data*, Oral Presentation at the annual meeting for the American Geophysical Union

- *Eccles, K.M., **Messier, K.P.** (2022, December) *Geospatial risk characterization mapping of chemical mixtures through connections to the the toxicological adverse outcome pathways.* Poster Presentation at the annual meeting for the American Geophysical Union.
- *Eccles, Kristin M and Rider, Cynthia V and **Messier, Kyle P**, (2022, November) *Geospatial Risk Assessment Using High-Throughput Screening Assays To Quantify Potential Adverse Effects From Exposure To Chemical Mixtures* . Oral Presentation at the annual meeting for the Society for Environmental Toxicology and Chemistry
- *Eccles, Kristin M and Karmaus, Agnes L and Kleinstreuer, Nicole C and Parham, Fred and Rider, Cynthia V and Wambaugh, John F and **Messier, Kyle P**, (2022, October) *A geospatial modeling approach to quantifying the risk of exposure to environmental chemical mixtures via a common molecular target.* Poster Presentation at the annual North Carolina Chapter Meeting for the Society of Toxicology
- *Eccles, K.M., **Messier, K.P.** (2021, December) *Geospatial risk characterization mapping of chemical mixtures through connections to the the toxicological adverse outcome pathways.* Oral Presentation at the annual meeting for the American Geophysical Union.
- *Eccles, K.M., Kleinstreuer, N.C., Wambaugh, J.F., **Messier, K.P.** (2021, August) *A geospatial modeling approach to quantifying risk of exposure to environmental chemical mixtures via a common molecular initiating event.* Oral Presentation at the conference for the International Society of Environmental Epidemiology.
- *Lowe, M.E., *Potter, T.A., Akhtari, F.S., Fargo, D.C., Schmitt, C.S., Schurman, S.H., Hall, J.E., Motsinger-Reif, A.A., **Messier, K.P.** (2021, August) *Air pollutant mixtures and autoimmune skin disease prevalence: findings from the Personalized Environment and Genes Study.* Oral Presentation at the conference for the International Society of Environmental Epidemiology.
- **Messier, K.P.** and Katzfuss, M. (2020, August) *Land-Use regression variable selection with spatiotemporal dependent errors and large sample size: A national and daily ground level NO_2 model.* Oral Presentation at the conference for the International Society of Environmental Epidemiology.
- Hilborn, E.D., DeFlorio-Barker, S., Smith, G.S., Murphy, M.S., Stout, J.E., Ghio, A.J., Hudgens, E.E., **Messier, K.P.**, Maillard, J-M., Egorov, A. (2019, December). *Geospatial analysis of environmental risks for isolation prevalence of pulmonary nontuberculous mycobacteria in a population cohort.* Poster presentation at American Geophysical Union Fall Meeting.
- Ward, M.H., Wheeler, D.C., Nolan, B.T., **Messier, K.P.**, Jones, R.R., Flory, A. (2018, September) *Modeling Nitrate Concentrations in Private Wells Using Machine Learning Methods.*Oral presentation at the joint conference of International Society of Exposure Science and International Society of Environmental Epidemiology
- Apte, J.S., **Messier, K.P.** (2018, September) *Are Low-Cost Sensors Ready for Prime Time? The Case of Mobile Monitoring*. Oral presentation at the joint conference of International Society of Exposure Science and International Society of Environmental Epidemiology

- **Messier, K.P.**, Chambliss, S.E., Alvarez, R., Brauer, M., Choi, J.J., Hamburg, S.P., Kerckhoffs, J., LaFranchi, B., Lunden, M.M., Marshall, J.D., Portier, C.J., Roy, A., Szpiro, A.A., Vermeulen, R.C.H., Apte, J.S. (2018, September) *Mapping air pollution with Google Street View cars: Efficient approaches with mobile monitoring and land use regression*. Oral presentation at the joint conference of International Society of Exposure Science and International Society of Environmental Epidemiology
- Apte, J.S., **Messier, K.P.**, Chambliss, S.E.,Brauer, M., Gani, S., Hamburg, S.P., Kirchstetter, T.W., Marshall, J.D., LaFranchi, B., Lunden, M.M., Marshall, J.D., Portier, C.J., Tuxen-Bettman, K., Vermeulen, R.C.H., Alvarez, R. (2018, September) *Understanding Traffic-Related Air Pollution Exposures through Mobile Monitoring*. Oral presentation at the joint conference of International Society of Exposure Science and International Society of Environmental Epidemiology
- **Messier, K.P.**, Chambliss, S., Gani, S., Lunden, M.M., Vermeulen, R.C.H., Alvarez, R., & Apte, J.S. (2017, October) *Air Quality Land Use Regression Model Robustness from Routine Mobile Monitoring Using Google Street View Vars.* Oral presentation at International Society of Exposure Science Annual Conference.
- **Messier, K.P.** (2017, June). *Land Use Regression of Spatially High-Resolution Air Pollution Data.* Oral presentation at Google Earth Engine Summit.
- Apte, J.S., **Messier, K.P.**, Gani, S., Vermeulen, R.C.H., Marshall, J.D., Kirchstetter, T.W., Portier, C., & Hamburg, S.P. (2016, October). *Mapping urban air quality in Oakland, CA with Google Street View vehicles* Oral presentation at American Association of Aerosol Research Annual Conference.
- Gani, S., **Messier, K.P.**, & Apte, J.S. (2016 October). *Exposure to outdoor ultrafine particles: Roles of traffic and atmospheric new particle formation.* Oral presentation at American Association of Aerosol Research Annual Conference.
- **Messier, K.P.**, Gani, S., Lunden, M.M., Vermeulen, R.C.H., Marshall, J.D., Kirchstetter, T.W., Hamburg, S.P., & Apte, J.S. (2016, October) *Spatial variability of air quality data from extensive mobile monitoring with Google Street View cars.* Oral presentation at International Society of Exposure Science Annual Conference.
- **Messier, K.P.**, Gani, S., Lunden, M.M., Vermeulen, R.C.H., Marshall, J.D., Kirchstetter, T.W., Hamburg, S.P., & Apte, J.S. (2016, September) *Lessons learned from extensive mobile air quality monitoring with Google Street View cars.* Oral Presentation at International Society of Environmental Epidemiology Annual Conference.
- Ayub, R., Obenour, D.R., **Messier, K.P.**, Serre, M.L., & Mahinthakumar, K. (2016, March) *Non-point source evaluation of groundwater contamination from agriculture under geologic and hydrologic uncertainty.* Poster Presentation at North Carolina Water Resources Research Institute Annual Conference.
- **Messier, K.P.** & Serre, M.L. (2015, December). *Development of an anisotropic geological-based land use regression and bayesian maximum entropy model for estimating groundwater radon across Northing Carolina.* Poster presentation at American Geophysical Union Fall Meeting.
- Holcomb, D., **Messier, K.P.**, Serre, M.L., Rowny, J., & Stewart, J. (2015, May). *Geostatistical prediction of microbial water quality on an urbanizing inland stream network.* Poster presentation at The Water Microbiology Conference.

- **Messier, K.P.**, Kane, E., Bolich, R., & Serre, M.L. (2014, December). *Evidence for legacy contamination of nitrate in groundwater of North Carolina using monitoring and private well data models.* Poster presentation at American Geophysical Union Fall Meeting.
- **Messier, K.P.**, Akita, Y., Campbell, T., & Serre, M.L.; (2013, March). *You're too gneiss, you take me for granite: Preliminary geology-based land use regression and kriging analysis of groundwater radon across North Carolina.* Oral presentation at the North Carolina Water Resource Research Institute Annual Conference.
- **Messier, K.P.**, Akita, Y., Bolich, R., Kane, E., & Serre, M.L.; (2013, March.)*Preliminary results of land use regression and kriging analysis of groundwater nitrate Across North Carolina.* Poster presentation at the North Carolina Water Resource Research Institute Annual Conference.
- **Messier, K.P.**, Akita, Y., Bolich, R., Kane, E., Campbell, T., & Serre, M.L. (2012, March). *Building a North Carolina groundwater nitrate database using multiple data sources and land use regression modeling.* Oral presentation at the North Carolina Water Resource Research Institute Annual Conference.
- **Messier, K.P.**, Akita, Y., Bolich, R., Kane, E., Campbell, T., & Serre, M.L. (2012, March). *Multiple North Carolina groundwater radon data sources and correlations with rock types.* Oral presentation at the North Carolina Water Resource Research Institute Annual Conference.
- Hilborn, E.D., Smith, G.S., Murphy, M.S., **Messier, K.P.**, Hudgens , E., Ghio ,A., Maillard, J.M., Pfaller, S., & Stout, J.E. (2011, June). *Nontuberculous Mycobacteria, reports of clinical laboratory isolation in a three county area, North Carolina, 2006—2010.* Poster presented at the International Conference on Emerging Infectious Diseases.
- **Messier, K.P.**, Akita, Y., & Serre, M.L. (2010, October). *Land use regression and bayesian maximum entropy spatiotemporal analysis of groundwater tetrachloroethylene in North Carolina.* Poster presented at the UNC Water and Health Conference: Science, Policy and Innovation.
- Jagai, J.S., Wang, S, **Messier, K.P.**, Wade T.J., & Hilborn, E.D. (2011, October). *Rates of gastrointestinal illness among areas impacted by combined sewer facilities: Analysis of Massachusetts data, 2003-2007.* Poster presentation at the UNC Water and Health Conference: Science, Policy and Innovation.
- Hilborn, E.D., Smith, G.S., Murphy, M.S., **Messier, K.P.**, Hudgens , E., Ghio ,A., Maillard, J.M., Pfaller, S., & Stout, J.E. (2011, May). *Modeling human exposure to Nontuberculosis Mycobacteria in central North Carolina.* Poster presentation at the ESRI Annual Conference.
- **Messier, K.P.**, Akita, Y., & Serre, M.L. (2009, March). *Cost-effective methods for estimation of groundwater contamination in North Carolina.* Oral presentation at the North Carolina Water Resource Research Institute Annual Conference.

Awards

January 2023 **NIEHS Paper of the Year**, *NIEHS Environmental Factor - 1 of 32 Papers of the Year from NIEHS funded research in 2022*.

A geospatial modeling approach to quantifying the risk of exposure to environmental chemical mixtures via a common molecular target

January 2023 **Intramural Paper of the Month**, *NIEHS Environmental Factor*.
The skin is no barrier to mixtures: air pollutant mixtures and reported psoriasis or eczema in the Personalized Environment and Genes Study (PEGS)

October 2022 **Intramural Paper of the Month**, *NIEHS Environmental Factor*.
A geospatial modeling approach to quantifying the risk of exposure to environmental chemical mixtures via a common molecular target

October 2022 **Best Poster Presentation in Postdoctoral Fellow Category**, *NC Society of Toxicology*.
Kristin M Eccles - A geospatial modeling approach to quantifying the risk of exposure to environmental chemical mixtures via a common molecular target.

2017 **Paper of the Year**, *Environmental Science & Technology*.
Primary contributor and co-author on paper of the year in Environmental Technology category for *High-Resolution Air Pollution Mapping with Google Street View Cars: Exploiting Big Data*

2013 & 2015 **Graduate Education Advancement Board**, *North Carolina Impact Award*.
Recognizing research benefiting the state of North Carolina

2013 **North Carolina Geographic Information Systems Conference**, *The G. Herbert Stout Award* .
For exemplary and innovative use of geographic information systems

Professional Services

Grant Review

- Health Effects Institute (HEI), Oct. 2022 - May 2024, Oversight panel for the Walter A. Rosenblith New Investigator Award to Dr. Joseph Antonelli, *Robust Statistical Approaches to Understanding the Causal Effect of Air Pollution Mixtures*

Hiring Committees

- Staff Scientist in the Integrative Health Assessment Branch of the Division of the National Toxicology Program, 2022
- Tenure-Track or Tenure-Eligible Investigator in Biostatistics and Computational Biology Branch, 2022
- Staff Scientist in the NTP Interagency Center for the Evaluation of Alternative Toxicology Methods (NICEATM) in the Division of the National Toxicology Program, 2021
- NIH/NIEHS Data Scholar in *Harnessing Geospatial Data for Environmental Public Health Protection*, 2021

Workshops

- NIEHS and NIH-All of Us, *Integrating Climate and Environmental Data and Justice into the All of Us Research Program*, Organizing Committee and Session Moderator, July 28-29, 2022
- NIEHS *Integrating Multiscale Geospatial Environmental Data into Large Population Health Studies*, Organizing Committee and Session Moderator, June 16-17, 2021

Peer Reviewer

- Nature Communications
- Proceedings of the National Academy of Sciences

- Journal of the American Statistical Association
- Environmental Health Perspectives
- International Journal of Epidemiology
- Environmental Science & Technology
- IEEE Transactions on Intelligent Transportation Systems
- Science of the Total Environment
- American Journal of Epidemiology
- Journal of Water and Health

Conference Session Chair

- American Geophysical Union, " Geospatial Data for Exposure and Risk Modeling: Approaches and Applications", New Orleans, LA & Virtual, Dec. 2021
- International Society of Exposure Science, "Spatial - Temporal Measures", Utrecht, The Netherlands, Oct. 2016

Professional Memberships

May 2022 - **Member**, *Society of Toxicology*.

August 2021 - **Member**, *American Geophysical Union*.

March 2016 - **Member**, *International Society of Exposure Science*.

March 2016 - **Member**, *International Society of Environmental Epidemiology*.

Statistical Software and Computer skills (*denotes expert-level)

prestoGP — penalized regression on spatiotemporal outcomes with Gaussian Processes- An R-package in development in collaboration with Sciome LLC. The package will implement the scalable penalized Gaussian process regression from Messier and Katzfuss (2021), but also include new developments for multivariate and left-censored data.

High Level Programming — R*, Julia, Python, Matlab* JavaScript, SAS, Git*, LaTeX*, Unix for High Performance Computing

Geographic Information Systems — QGIS*, ESRI ArcGIS*, Google Earth Engine

Microsoft Office — Access*, Excel*, Powerpoint*, Word*