STEPHANIE E. CLELAND, PhD, MSPH

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RESEARCH FOCUS

Topic: Human health impacts of exposure to climate change-influenced environmental hazards

Tools: Environmental epidemiology, spatiotemporal exposure assessment, health impact assessment

PROFESSIONAL EXPERIENCE

Simon Fraser University – Burnaby, British Columbia
Faculty of Health Sciences
Assistant Professor, Legacy for Airway Health Chair in Promotion of Lung Health 2023 – present

Vancouver Coastal Health Research Institute – Vancouver, British Columbia
Legacy for Airway Health
Research Scientist 2023 – present

British Columbia Centre for Disease Control – Vancouver, British Columbia
Environmental Health Services
Affiliate Investigator 2024 – present

University of British Columbia – Vancouver, British Columbia
Faculty of Medicine, Division of Respiratory Medicine
Affiliate Assistant Professor 2024 – present

United States Environmental Protection Agency - Chapel Hill, North Carolina
Center for Public Health and Environmental Assessment
Oak Ridge Institute for Science and Education (ORISE) Research Fellow 2020 – 2023

University of North Carolina-Chapel Hill - Chapel Hill, North Carolina
The Climate Health and Air Quality Lab
Graduate Research Assistant 2018 – 2020

Department of Environmental Sciences and Engineering
Graduate Teaching Assistant 2018 – 2019

CleanAIRE NC – Durham, North Carolina
Advocacy & Education Intern 2020

athenahealth - Watertown, Massachusetts
athenaClinicals Performance & Analytics
Product Analytics Associate 2017 – 2018

athenaClinicals Task Awareness
Product Management Associate 2016 – 2017

EDUCATION

University of North Carolina-Chapel Hill – Chapel Hill, North Carolina
Gillings School of Global Public Health
Doctor of Philosophy, Environmental Sciences & Engineering — May 2023
Advisors: Dr. Ana Rappold and Dr. Jason West

Master of Science in Public Health, Environmental Sciences & Engineering — May 2020
Advisors: Dr. Marc Serre and Dr. Jason West

Graduate Certificate in Global Health — May 2020

Tufts University – Medford, Massachusetts
Bachelor of Science, Computer Science and Community Health, *cum laude* — May 2016

PEER-REVIEWED PUBLICATIONS

Cleland, S.E., Steinhardt, W., Neas, L., West, J.J., Rappold, A.G. (2023). Urban heat island impacts on heat-related cardiovascular morbidity: A time series analysis of older adults in US metropolitan areas. *Environment International.* doi.org/10.1016/j.envint.2023.108005.
Interactive dashboard: shiny.epa.gov/Heat_CVD_UHI_Dashboard/

Wyatt, L.H., **Cleland**, S.E., Wei, L., Paul, N., Patil, A., Ward-Caviness, C., Henderson, S.B., Rappold, A.G. (2023). Long-term exposure to ambient O_3 and $PM_{2.5}$ is associated with reduced cognitive performance in young adults: A retrospective longitudinal repeated measures study in adults aged 18–90 years. *Environmental Pollution, 320.* doi.org/10.1016/j.envpol.2023.121085.

Cleland, S.E., Wyatt, L.H., Wei, L., Paul, N., Serre, M.L., West, J.J., Henderson, S.B., Rappold, A.G. (2022). Short-term exposure to wildfire smoke and $PM_{2.5}$ and cognitive performance in a brain-training game: A longitudinal study of US adults. *Environmental Health Perspectives, 130(6).* doi.org/10.1289/EHP10498.
Interactive dashboard: ehs-bccdc.shinyapps.io/PMSmoke_Attention_Dashboard/
☆ Selected for *EHP's* Editor's Choice Collection 2022 [link]

Cleland, S.E., Serre, M.L., Rappold, A.G., West, J.J. (2021). Estimating the acute health impacts of fire-originated $PM_{2.5}$ exposure during the 2017 California wildfires: Sensitivity to choices of inputs. *GeoHealth, 5(7).* doi.org/10.1029/2021GH000414

Delang, M.N., Becker, J.S., Chang, K.L., Serre, M.L., Cooper, O.R., Schultz, M.G., Schröder, S., Lu, X., Zhang, L., Deushi, M., Josse, B., Keller, C.A., Lamarque, J., Lin, M., Liu, J., Marécal, V., Strode, S.A., Sudo, K., Tilmes, S., Zhang, L., **Cleland**, S.E., Collins, E.L., Brauer, M., West, J.J. (2021). Mapping yearly fine resolution global surface ozone through the Bayesian Maximum Entropy data fusion of observations and model output for 1990-2017. *Environmental Science and Technology, 55.* doi.org/10.1021/acs.est.0c07742

Cleland, S.E., West, J.J., Jia, Y., Reid, S., Raffuse, S., O'Neill, S., Rappold, A.G., Serre, M.L. (2020). Estimating wildfire smoke concentrations during the October 2017 California fires through BME space/time data fusion of observed, modeled, and satellite-derived $PM_{2.5}$. *Environmental Science and Technology, 54* (*21).* doi.org/10.1021/acs.est.0c03761

Brugge, D., Simon, M.C., Hudda, N., Zellmer, M., Corlin, L., **Cleland,** S.E., Liu, E.Y., Rivera, S., Byrne, M., Chung, M., Durant, J.L. (2017). Lessons from in-home air filtration intervention trials to reduce urban ultrafine particle number concentrations. *Building and Environment, 126.* doi.org/10.1016/j.buildenv.2017.10.007

RESEARCH FUNDING

Canadian Institutes of Health Research - Project Grant October 2024 – September 2027
Early Life Exposures to Wildfire Smoke and Respiratory Health Outcomes During Childhood
Role: Principal Investigator *Amount:* $294,526
Co-Principal Investigator: S.B. Henderson
Co-Investigators: E.P. Brigham, E. Lavigne, A-M. Nicol, T. To

Canadian Institutes of Health Research - Team Grant in Lung Health April 2024 – March 2029
Lungs on Fire: Wildfire Smoke, Incident Diseases, Susceptible Populations, and Community Values in Canada
Role: Co-Principal Investigator *Amount:* $1,999,990
Principal Investigator: C. Carlsten
Co-Principal Investigators: N. Bansback, M. Brauer, E.P. Brigham, P. Camp, S.B. Henderson, N. Mookherjee

CONFERENCE PRESENTATIONS

Cleland, S.E., Paul, N., Coker, E., Henderson, S.B. (2024 August). The co-occurrence of wildfire smoke and extreme heat events in British Columbia, 2010-2022: Spatiotemporal patterns in population-level exposure [Oral presentation]. 36th Annual Conference of the International Society for Environmental Epidemiology, Santiago, Chile.

Cleland, S.E. (2024 January). The cognitive and mental health impacts of wildfire smoke exposure [Invited oral presentation]. Annual Cascadia Symposium on Environmental, Occupational, and Population Health, Blaine, Washington, United States of America.

Cleland, S.E., Paul, N., Coker, E., Henderson, S.B. (2024 January). Population-level exposure to co-occurring wildfire smoke and extreme heat events in British Columbia, 2010 – 2022 [Oral presentation]. Annual Cascadia Symposium on Environmental, Occupational, and Population Health, Blaine, Washington, United States of America.

Cleland, S.E., Rosman, L., Hill, K.L., Mazzella, A.J., Ward-Caviness, C., Rappold, A.G. (2023 September). The impact of temperature and relative humidity on ventricular arrhythmias in patients with implanted cardiac devices in North Carolina, 2010-2021 [Oral presentation]. 35th Annual Conference of the International Society for Environmental Epidemiology, Kaohsiung, Taiwan.

Cleland, S.E., Wyatt, L.H., Wei, L., Paul, N., Serre, M.L., West, J.J., Henderson, S.B., Rappold, A.G. (2022 November). Daily and hourly exposure to wildfire smoke and $PM_{2.5}$ and cognitive performance in a brain-training game: A longitudinal study of US adults [Oral presentation]. 2022 Wildland Fire Canada Conference, Edmonton, Alberta, Canada.

Cleland, S.E., Steinhardt, W., Neas, L., Rappold, A.G. (2022 September). Urban heat islands and heat-related cardiovascular morbidity in older adults: A time series study of US metropolitan areas [Poster presentation]. 34th Annual Conference of the International Society for Environmental Epidemiology, Athens, Greece.

Cleland, S.E., Wyatt, L.H., Wei, L., Paul, N., Patil, A., Henderson, S.B., Rappold, A.G. (2021 December). The cognitive performance effects of short-term $PM_{2.5}$ and wildfire smoke exposure [Oral presentation]. American Geophysical Union Fall Meeting 2021, New Orleans, Louisiana, United States of America.

Cleland, S.E., West, J.J., Jia, Y., Reid. S., Raffuse, S., O'Neill, S., Serre, M.L. (2021 September). Fusing observed, modeled, and satellite-derived concentrations to produce fine-resolution estimates of $PM_{2.5}$

during the 2017 California wildfires [Invited oral presentation]. 2021 Meteorology and Climate - Modeling for Air Quality Conference, Virtual.

Cleland, S.E., Wyatt, L.H., Wei, L., Paul, N., Patil, A., Henderson, S.B., Rappold, A.G. (2021 August). Short-term $PM_{2.5}$ exposure impacts cognitive performance: A longitudinal repeated measures study of the Western US 2017-2018 [Lightning talk presentation]. 33rd Annual Conference of the International Society for Environmental Epidemiology, Virtual.

Cleland, S.E., West, J.J., Jia, Y., Reid, S., Raffuse, S., O'Neill, S., Rappold, A.G., Serre, M.L. (2020 September). A data fusion approach for evaluating smoke exposure: Estimating $PM_{2.5}$ during the 2017 California wildfires [Oral presentation]. International Society of Exposure Science 30th Annual Meeting, Virtual.

Cleland, S.E., West, J.J., Jia, Y., Reid. S., Raffuse, S., O'Neill, S., Serre, M.L. (2020 August). A space/time data fusion method for estimating smoke concentrations during the October 2017 California fires to inform population-level exposure [Oral presentation]. 32nd Annual Conference of the International Society for Environmental Epidemiology, Virtual.

Cleland, S.E., West, J.J., Serre, M.L. (2020 April). Evaluating the acute health impact of $PM_{2.5}$ exposure during the October 2017 California wildfires [Oral presentation]. 3rd International Smoke Symposium, Virtual.

Cleland, S.E., Serre, M.L., Becker, J., DeLang, M., West, J.J. (2019 October). Fusing CMAQ with observations to estimate the air quality and health impacts of the October 2017 California wildfires [Poster presentation]. 18th Annual Community Modeling and Analysis System Conference, Chapel Hill, North Carolina, United States of America.

Cleland, S.E., Serre, M.L., Becker, J., DeLang, M., West, J.J. (2019 October). Estimating the hospital admissions attributable to the 2017 California wildfires [Poster presentation]. 2019 Triangle Global Health Annual Conference, Durham, North Carolina, United States of America.

INVITED TALKS

Cleland, S.E. (2024 September). Wildfire Smoke and Lung Health: Knowns, Unknowns and Future Directions. BC Lung Foundation Webinar, Virtual.

Cleland, S.E., Wilkinson, S., Murphy, B., Nelson, A. (2024 September). Megafires in BC: Impacts, Strategies, and Future Outlook. Vancouver Climate Day, Vancouver, British Columbia, Canada.

Cleland, S.E. (2024 June). The health impacts of wildfire smoke and exposure mitigation strategies. BC Municipal Safety Association Regular General Meeting, Virtual.

Cleland, S.E., Whitehead, J., Nelson, A., Freeman, R. (2024 May). The wildfire crisis. SFU Vancouver Lunch 'n' Learn, Vancouver, British Columbia, Canada.

Cleland, S.E., Yao, A., Barn, P., Coker, E., Brigham, E., Pawlovich, J., Newton, C. (2024 May). Protecting patients through wildfire Season: What you need to know. University of British Columbia Continuing Professional Development Webinar, Virtual.

Cleland, S.E. (2024 April). The impacts of wildfire smoke exposure on cognitive health. Oregon Smoke Ready Communities Group Meeting, Virtual.

Cleland, S.E., Lan, J., Brauer, M., Henderson, S.B. (2023 October). Diverse health impacts of wildfire smoke [Webinar]. Cascadia Wildfire Webinar, Virtual.

Cleland, S.E. (2022 July). Daily and hourly exposure to $PM_{2.5}$ and wildfire smoke and cognitive performance in a brain-training game: A longitudinal study of US adults. National Collaborating Centre for Environmental Health: Environmental Health Seminar Series, Virtual.

Cleland, S.E. & Wyatt, L.H. (2021 September). The impacts of short and long-term exposure to air pollution on cognitive performance. University of British Columbia: Occupational and Environmental Hygiene Friday Seminars, Virtual.

TEACHING EXPERIENCE

Instructor:

Environmental Health Exposure Assessment and Analysis — Spring 2024
HSCI 471/846, Simon Fraser University

Teaching Assistant:

Space/Time Exposure Mapping and Risk Assessment — Spring 2019
ENVR 765, University of North Carolina-Chapel Hill

Temporal GIS and Space/Time Geostatistics for the Environment and Public Health — Fall 2018
ENVR 468, University of North Carolina-Chapel Hill

KNOWLEDGE TRANSLATION

The Conversation: "As wildfires become more frequent and intense, how will persistent smoke exposure affect long-term health?" Stephanie Cleland and Ryan Allen, July 26, 2024. [link]

The Conversation: "These tips can help keep you safe during a potentially severe 2024 wildfire season." Stephanie Cleland, May 23, 2024. [link]

The Conversation: "Wildfire smoke is an increasing threat to Canadians' health." Ryan Allen and Stephanie Cleland, August 27, 2023. [link]

MEDIA OUTLET INTERVIEWS

The New York Times: "How Wildfire Smoke Threatens Health." Jane C. Hu. August 28, 2024. [link]

The Weather Channel: "Wildfire Smoke: New Research Links to Brain and Mental Health." August 23, 2024. [link]

CBC Radio: "A B.C. program is helping vulnerable residents breathe easier with homemade air cleaners." August 16, 2024. [link]

NBC News: "Wildfire smoke is probably harming your brain." Aria Bendix. July 30, 2024. [link]

Healthline: "Long-Term Exposure to Wildfire Smoke May Raise Your Risk of Dementia." Shawn Radcliffe. July 30, 2024. [link]

Science News: "Wildfire smoke may cause tens of thousands of premature deaths." Aimee Cunningham. June 7, 2024. [link]

SFU Engage Magazine: "Addressing the urgent human health impacts of B.C. wildfires." Summer 2024. [link]

CFNR Network: "Expert advises precautions as wildfire season begins in BC." Sabrina Spencer. May 17, 2024. [link]

CKPG Today: "Prince George Emergency Operation Centre in need of a permanent facility says city official." Chris Koo. April 29, 2024. [link]

SFU Faculty of Health Sciences: "New assistant professor brings creative, collaborative quantitative approaches to planetary health research." Sharon Mah. November 6, 2023. [link]

Daybreak North with Carolina de Ryk. Radio interview about how wildfire smoke affects human health. September 8, 2023. [link]

Freetrail: "Running Through Smoke." Keegan Sentner, September 7, 2023. [link]

National Geographic: "How wildfire smoke can permanently damage your brain and body." Tara Haelle, August 14, 2023. [link]

UNC Gillings School of Global Public Health: "New research finds risk from hot weather depends partly on where you live." July 31, 2023. [link]

EPA Science Matters: "Fighting the Haze: Effects of Wildfire Smoke and Particulate Matter on Brain Function." May 4, 2023. [link]

Press Democrat: "Concerns about long-term health effects grow since 2017 North Bay wildfires." Martin Espinoza, October 17, 2022. [link]

UNC Gillings School of Global Public Health: "Could an app help scientists understand wildfire smoke's impact on cognition?" August 16, 2022. [link]

EHP Science Selection: "Well Played: Using Game App Data to Assess Wildfire Smoke and Cognitive Performance." Charles Schmidt, July 13, 2022. [link]

AWARDS & HONORS

Gillings School Academic Excellence Award [UNC-Chapel Hill]	2023
Gary G. Koch and Carolyn J. Koch Student Travel Award [UNC-Chapel Hill]	2021
UNC-Chapel Hill's Three Minute Thesis Competition Finalist	2021
National Institute for Occupational Safety and Health (NIOSH) Training Grant	2020
Department of Environmental Sciences & Engineering's Environmental Sciences Achievement Award [UNC-Chapel Hill]	2020
Best Student Poster at the 18th Annual Community Modeling and Analysis System Conference	2019
Triangle Global Health Annual Conference Student Scholarship	2019
Weiss Urban Livability Fellowship [UNC-Chapel Hill]	2018
B.B. Parker Fellowship [UNC-Chapel Hill]	2018
Alan and Linda Rimer Endowed Scholarship in Environmental Science [UNC-Chapel Hill]	2018
Gillings Merit Scholarship [UNC-Chapel Hill]	2018

PROFESSIONAL & VOLUNTEER SERVICE

Professional:

Member of the Tenure and Promotion Committee 2024 - present
Simon Fraser University, Faculty of Health Sciences

Member of Network Advisory Committee 2024 - present
BC Respiratory Health Network (RespNetBC)

Graduate Student Representative at Faculty Meetings 2019 - 2020
UNC-Chapel Hill, Department of Environmental Sciences & Engineering

Ad Hoc Reviews:

Journals: GeoHealth, Nature Climate Change, Scientific Reports, Environmental Research 2023 - present

Grants: SSHRC Insight Grants 2024

Institutional: Applications for MPH Program (Simon Fraser University) 2024

Volunteer:

Skype a Scientist, Science communication outreach to K-12 classrooms 2023 - present

CleanAIRE NC, Member of planning committee for NC BREATHE Conference 2020 – 2023

Science Club for Girls, Mentor for after-school science club for elementary school girls 2017 – 2018

RELATED SKILLS & MEMBERSHIPS

Programming Languages: R, MATLAB, Python, SQL, C++, Java, HTML, CSS, JavaScript

Software: RStudio, MATLAB, ArcGIS, STATA, Jupyter, Adobe Creative Suite, Microsoft Office Suite

Memberships: International Society of Environmental Epidemiology, International Society of Exposure Science