

# 2024 ANNUAL REPORT

Climate & Health Institute

THE GEORGE WASHINGTON UNIVERSITY

Milken Institute School of Public Health

THE GEORGE WASHINGTON UNIVERSITY

# A MESSAGE FROM THE DIRECTOR

# Susan Anenberg, PhD



For the past three years I have had the tremendous privilege of serving as the Director of the GW Climate and Health Institute. Our steadfast vision of an evidence-based global response by governments and stakeholders to mitigate the climate crisis and equitably improve public health, is continually advanced through: 1) conducting policy-relevant and community-oriented research that reveals relationships between climate change, human health, and equity; 2) educating and empowering the newest generation of leaders in equitably minimizing climate change and its health consequences; and, 3) communicating and translating cross-disciplinary knowledge to integrate health and equity into actions to address climate change. The generous support we receive from the Milken Institute School of Public Health continues to allow us to make important and impactful contributions to the climate and health space, for which I am extremely grateful.

As we know, climate change has a profound impact on human health, and the actions we take to mitigate and adapt to a warming climate matter. And, leveraging multidisciplinary, systems thinking, and equity-focused approaches to achieve an evidence-based response is imperative to protecting population health. The 2023-2024 academic year has had marked successes, which are highlighted throughout this report under our three pillars of operational focus: research, training, and action. I am proud of the Institute's accomplishments, which continue to set a standard of excellence for effective communication and translation of knowledge, skilled training of the newest generation of climate and health leaders, and thoughtful and intentional advocacy with the aim of improving public health.

I look forward to sustained collaboration with other GW initiatives, such as the Sumner M. Redstone Global Center for Prevention and Wellness, Planet Forward, Global Food Institute (GFI), and the newly launched GW Alliance for a Sustainable Future. With CHI affiliates holding leadership positions in all of these distinguished centers and institutes, it presents an incredible opportunity for the University to make an impact locally, nationally, and globally.

I would like to thank all our affiliated faculty, staff, students, and alumni, as well as our internal and external collaborators, for your continued engagement, collaboration, and partnership. Without your vision and dedication, this essential and significant work would not be possible.

Sincerely,

**Susan Anenberg** 

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Director, GW Climate and Health Institute

Professor and Chair of Environmental and Occupational Health

Milken Institute School of Public Health

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# AREAS OF ENGAGEMENT: RESEARCH

Research led by affiliated faculty members spans a range of topics within the climate and health space, including air pollution and asthma, infectious disease, sustainability, extreme weather and ecosystem changes, social movements around climate change, risk assessment and policy, the Arctic, climate litigation, occupational health, food systems and nutrition, and equity and Environmental Justice. The CHI also regularly supports student research through the CHI Research Fellows program, which is a semester-long, paid opportunity open to all GW degree-seeking students.

#### Research



SUMMER 2023



# SAVITA POTARAZU

Savita Potarazu is a fourth-year medical student at the GW School of Medicine and Health Sciences and recently received her Master's in Public Health between her third and fourth years of medical school. Savita's fellowship project included a waste audit of outpatient OBGYN procedures to better understand current institutional waste management practices, identify waste treatment pathways, and estimate annual waste output by category. In addition to the above primary research outcomes, she developed guidelines to reduce waste while maintaining effective infection prevention and calculated expected cost-savings with improved adherence to waste minimization.

**FALL 2023** 



#### LIZ ROSE

Liz Rose is a third-year graduate student pursuing her Master's of Professional Studies in Sustainable Urban Planning. Liz's fellowship project included the collection of socio-health data for Eastern Kentucky, specifically Perry County, to investigate rates of suicide, depression, obesity, drug use, teenage pregnancy, food insecurity, and homelessness, placing these health considerations in the context of the decline of the coal economy in this region (specifically the transition away from coal and towards a more diversified portfolio of natural gas, nuclear, and renewables).

**FALL 2023** 



## JULIETTE ANNE JACKSON

Juliette Anne Jackson is a Master of Laws (LLM) student specializing in Environmental & Energy Law, focused on Indigenous rights, at GW Law School. Juliette's fellowship project focused on assessing the current landscape of advocacy, law, policy, and regulation pertaining to animal law, environmental law, and Indian law/Indigenous rights by conducting an analysis that identifies: 1) the current risks/harms impacting the Klamath tribes; 2) what methods, if any, are being used to remedy the contamination; and 3) what innovative legal methods or policy actions the tribes could take.

#### SPRING 2024



# SILVANA BARBOSA

Silvana Barbosa is a second-year graduate student at GW's Milken Institute School of Public Health. Silvana's project assessed anesthesia providers' perceptions of the environmental impacts of inhaled anesthetics. The project also examined trends associated with purchasing and use of inhaled anesthetic gases at GW Hospital. Project outcomes measured the effectiveness of educational interventions in increasing awareness of the environmental impacts of inhaled anesthetics and provided insight into current use of inhaled anesthetics to inform future purchasing.

#### SPRING 2024



# **ALIA BADAWI**

Alia Badawi is a third-year medical student at the GW School of Medicine and Health Sciences. Alia's project aimed to reduce regulated medical waste in the clinical setting through a staff education initiative. Regulated medical waste is one of the most financially and environmentally costly waste streams to manage, which makes it important to only include appropriate waste in these receptacles. Outcome measures of the project will be used to help inform scaling similar initiatives in the hospital.

#### RESEARCH HIGHLIGHTS

**Payman Dehghanian**, Associate Professor of Electrical & Computer Engineering, GW School of Engineering and Applied Sciences, and Director of the <u>GW SmartGrid Laboratory</u>, was selected as a "future digileader" for his work on emerging digitalization of power grids. Future Digileaders is an annual event for selected early-career researchers in the field of digitalization, providing an international venue for insight, discussion, and connection. Dehghanian was among 40 exceptional individuals selected to attend this flagship event.

Susan Anenberg, Professor and Chair of Environmental and Occupational Health, Milken Institute School of Public Health, and Gaige Kerr, Assistant Research Professor of Environmental and Occupational Health, Milken Institute School of Public Health, were awarded a grant from the Wellcome Trust for a project entitled, "Climate, Economics and Health: Adding air quality impacts into social cost of carbon estimates." The grant is led by Kevin Cromar from New York University and also includes researchers from Resources for the Future. The researchers will estimate future health burdens from wildfire smoke and integrate them into the Environmental Protection Agency's (EPA) social cost of carbon metric.

In early June 2023, The National Aeronautics and Space Administration (NASA) unveiled their new Earth Information Center (EIC) located in the lobby at their headquarters in Washington, D.C. Research on air pollution inequality in the District from the **GWSPH Air, Climate, and Health Lab**, led by CHI Director Susan Anenberg, is featured on the Hyperwall, NASA's famous screen that displays high resolution maps and graphs using satellite data.





**Kelvin Fong**, Assistant Professor of Environmental and Occupational Health, Milken Institute School of Public Health, and **Rachel Clark**, Director of Policy for the Sumner M. Redstone Global Center for Prevention and Wellness, were awarded a GWSPH Research Innovation Award (RIA) for their proposal on Advancing Green Space Assessment in Epidemiology. They will create a new green space measure that better captures access to parks, aiming to better inform decision-making around planning and interventions to improve public health via urban greening.

**Kelvin Fong**, Assistant Professor of Environmental and Occupational Health, Milken Institute School of Public Health, and **Anand Gourishankar**, Professor of Pediatric Hospital Medicine, GW School of Medicine and Health Sciences, and Physician at Children's National, were awarded a Cross-Disciplinary Research Fund (CDRF) Award from the Office of the Vice Provost for Research (OVPR) for a project entitled, "Addressing Air Pollution, Social Determinants of Health, and Environmental Justice in Pediatric Asthma." The project aims to understand the spatial differences in pediatric asthma cases attributable to air pollution exposures and investigate how these short-term exposures affect pediatric asthma risk in the District of Columbia.

Nina Kelsey, Associate Professor of Public Policy and of International Affairs, GW Trachtenberg School of Public Policy & Public Administration and GW Elliott School of International Affairs, was awarded a Sustainability Research Institute Innovation Fund Grant for a project entitled, "The Roots and Branches of Sustainability Culture: Extreme Climate Activism." This proposal intends to investigate extreme climate activism (ECA) in Germany to assess how countries like Germany become leaders in sustainability and green politics, the role ECA plays in German culture, and how policy makers should respond to ECA.

#### FEATURED PUBLICATIONS

Rachel Clark, Director of Policy for the Sumner M. Redstone Global Center for Prevention and Wellness, Milken Institute School of Public Health, Bill Dietz, GW Global Food Institute Director of Research and Policy and Professor of Exercise and Nutrition Sciences, Milken Institute School of Public Health, and Doctoral student Sydney Pryor, Milken Institute School of Public Health, published a paper in the American Journal of Public Health entitled, "Where was Climate Change at the White House Conference on Hunger, Nutrition, and Health?" This article presents a call-toaction to incorporate climate mitigation and sustainability considerations into the National Strategy on Hunger, Nutrition, and Health, emphasizing the need for the Biden administration to align its food and nutrition policies with its climate policies.



Savita Potarazu, medical student at GW School of Medicine and Health Sciences and Summer 2023 CHI Research Fellow, co-authored a paper published in Seminars in Perinatology entitled, "Pregnancy and newborn health - heat impacts and emerging solutions." Synthesizing evidence from the current body of literature, researchers conclude that heat is associated with both adverse pregnancy and newborn health outcomes, offering solutions and educational and clinical resources for both clinicians and patients.



Anneliese Palmer, Research Professor of Science Communication, Columbian College of Arts & Sciences, published an article in *Nature Cities* entitled, "New Inroads on Community-centric Placemaking." Urban governance structures are being reshaped in certain parts of the world, inviting community members to engage in decision-making related to civic projects such as parks and plazas, as well as assets such as connectivity infrastructure.



Gaige Kerr, Assistant Research Professor of Environmental and Occupational Health, Milken Institute School of Public Health, along with Dan Goldberg, Assistant Research Professor of Environmental and Occupational Health, Milken Institute School of Public Health, and Susan Anenberg, Professor and Chair of Environmental and Occupational Health, Milken Institute School of Public Health, published a new paper published in Environmental Health Perspectives entitled, "Increasing Racial and Ethnic Disparities in Ambient Air Pollution-Attributable Morbidity and Mortality in the United States." This research evaluates how air pollution impacts minoritized populations, finding that despite overall decreases in public health impacts associated with exposure to nitrogen dioxide and fine particulate matter, racial and ethnic relative disparities in health burdens attributable to air pollution have widened in the United States (US) over the past decade.



This work has been featured in several media pieces including:

- GW Today feature entitled, "Communities of Color across the U.S. Suffer Growing Burden from Polluted Air"
- Wisconsin Public Radio's 'Central Time'
- NBC4 Washington News segment entitled, "Communities of color at increased risk of diseases linked to air pollution: GW study"





Finn Dobkin, Doctoral student, GW Trachtenberg School of Public Policy & Public Administration, and Gaige Kerr, Assistant Research Professor of Environmental and Occupational Health, Milken Institute School of Public Health, recently co-authored an article published in the Journal of Environmental Studies and Sciences entitled, "Demographic disparities in United States Clean Air Act PM2.5 attainment counties: assessing population living in nonattainment conditions." This research assesses the geographic disparities in PM2.5 exposure within regions that are categorized as 'in attainment' under the Clean Air Act. The authors found that in 2020, over 6.73 million Americans were living in counties categorized as in attainment, yet experienced exposures at the census-tract level that exceeded the required attainment concentrations. Furthermore, the census tracts that experienced the most elevated concentrations have a disproportionate number of Hispanic and foreign-born residents.



Greta Martin, Doctoral student, Milken Institute School of Public Health, Robert Canales, Associate Professor of Environmental and Occupational Health, Milken Institute School of Public Health, and Susan Anenberg, Professor and Chair of Environmental and Occupational Health, Milken Institute School of Public Health, coauthored a new paper published in GeoHealth entitled, "Tracking Progress Toward <u>Urban Nature Targets Using Landcover and Vegetation Indices: A Global Study for the</u> 96 C40 Cities." This research evaluated the progress on declared green and blue space urban nature targets for 96 member-cities of C40 cities, a global network of Mayors committed to deep cuts in emissions to build healthy, equitable, and resilient communities in the face of the climate crisis.



# AREAS OF ENGAGEMENT: TRAINING

The George Washington University has unique course, concentration, and program offerings that advance innovative solutions, encourage multidisciplinary and systems thinking approaches, and center environmental and social justice in both response and adaptation to climate change. In addition to academic and research-focused training, the CHI hosted several internal events and external networking opportunities with the aim of facilitating an exchange of knowledge on topics related to climate and health.



#### TRAINING HIGHLIGHTS

# Curriculum and concentration offerings:

- Longitudinal climate + health curriculum in GW School of Medicine and Health Sciences (SMHS): In early 2023 the official approval was given to include climate change as a longitudinal curriculum theme within medical school education. This new theme integrates climate change and Environmental Justice throughout all 4 years of medical school coursework in order to educate the next generation of clinicians on the health concerns of a changing climate and teach them how to best care for their future patients.
- MPH@GW Climate + Health Concentration launched, Milken Institute School of Public Health (GWSPH): Launched Spring 2023, GWSPH now offers a concentration in Climate and Health in the Online Master of Public Health program (MPH@GW). This first-of-its-kind, groundbreaking concentration trains individuals to assess environmental exposures and public health risks associated with anthropogenic climate change, and how to mitigate these health risks through taking a systems approach.

# Course offerings:

# Milken Institute School of Public Health

- PUBH 6130: Sustainable Energy and the Environment
- PUBH 6135: Researching Climate Change and Human Health
- PUBH 6140: Global Climate Change and Air Pollution

# School of Medicine and Health Sciences

- EMED 516: Wilderness Medicine
- MED 338: Occupational and **Environmental Medicine**
- IDIS 361: Disaster Medicine
- IDIS 365: Environmental Health Track Elective

#### **EVENT HIGHLIGHTS**

On October 18, 2023 the CHI hosted a participatory panel discussion that highlighted individuals with careers in the climate and health space. This panel featured **Danny Malashock**, Environmental Health Scientist at the EPA and member of the US Public Service Commissioned Corps, and **Mark Shimamoto**, Vice President of Global Outreach and Partnerships at the American Geophysical Union (AGU).

On March 26, 2024 the CHI hosted WUSA9 Meteorologist, **Kaitlyn McGrath**, for a presentation and Q&A session on climate change communication.









On May 3, 2024 the CHI co-hosted a research seminar with the Environmental and Occupational Health (EOH) Department at GWSPH which featured **Kristi Pullen Fedinick**, Associate Research Professor of Environmental and Occupational Health, Milken Institute School of Public Health. Pullen Fedinick's talk examined how social vulnerability can affect access to clean air, safe water, and environments free from toxic chemicals, and explored how cumulative approaches to chemical assessment can be structured to improve protections for vulnerable and susceptible populations.

The CHI co-sponsored several receptions over the past year that convened thought leaders across the climate and health space:

A One Health reception with the U.S.
 Department of State Bureau of Oceans and International Environmental and Scientific Affairs on June 14, 2023, which brought together researchers, practitioners, and policymakers to underscore the value of innovative research on climate and health in Africa.



• A salon-style networking reception centered around climate, health, and Environmental Justice in research and in practice at the American Geophysical Union (AGU) annual conference in December 2023. Attracting around 100 attendees, the event featured several distinguished speakers who shared cutting-edge developments and new efforts to generate a thriving climate and health community of practice, including Allison Crimmins, Director of the Fifth National Climate Assessment. The event was co-sponsored by the AGU GeoHealth section and the US Global Change Research Program.

# **AREAS OF ENGAGEMENT: ACTION**

CHI members continue to make impactful contributions both within the Institute and University, and beyond. Some avenues of engagement include participation in the public comment and testimony process, authorship of influential reports and white papers, service on renowned committees, and expert involvement with various forms of media.



## **ACTION HIGHLIGHTS**

Public Testimony and Comments:

- March 18, 2024: District Committee on Transportation and the Environment. Testimony in strong support of the Environmental Justice Amendment Act of 2023 and further recommendations on conducting cumulative impact assessment, as well as considerations for the establishment of a new DC Department of Energy & Environment Environmental Justice Division.
- May 16, 2024: Metropolitan Washington Air Quality Committee (MWAQC). Comments support the development of the Metropolitan Washington Council of Governments (MWCOG) Environmental Justice Action plan, suggesting several recommendations for consideration when developing the plan including: 1) the establishment of cumulative impact assessments; 2) the co-generation of Environmental Justice goals and aims with community members; and, 3) the prioritization of community engagement in accountability processes.

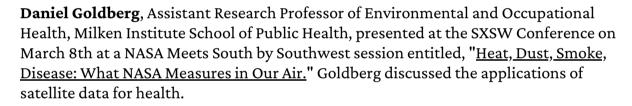
Susan Anenberg, Professor and Chair of Environmental and Occupational Health, Milken Institute School of Public Health, and Carlos Santos-Burgoa, Professor of Global Health, Milken Institute School of Public Health, were chapter authors of The Fifth National Climate Assessment. A congressionally mandated, interagency effort, The Fifth National Climate Assessment is the preeminent report used by the US government to support evidencebased and informed decision-making on climate change impacts, risks, and responses across the US. Anenberg was an author on the <u>Transportation</u> chapter and Santos-Burgoa was an author on the <u>US Caribbean</u> chapter.

Our partners in The Sumner M. Redstone Global Center for Prevention and Wellness published a white paper outlining the climate and health benefits of road pricing policies. Driving Change: Road Pricing as a Public Health Strategy for the District of Columbia highlights the potential for important public health, equity, and environmental co-benefits that could be enjoyed by District residents if a road pricing program was put into place. Rachel Clark, Director of Policy for the Sumner M. Redstone Global Center for Prevention and Wellness, and Claire Summa, Research Assistant for the Sumner M. Redstone Global Center for Prevention and Wellness, wrote an opinion piece to accompany the white paper which was published by Greater Greater Washington: The ride was never free: It's time to price our roads for health and climate.

**Tara Scully**, GW Global Food Institute Director of Curriculum Development and Associate Professor of Biology, Columbian College of Arts & Sciences, was a guest on the live filming of <u>Science Friday</u> which was hosted at the George Washington University on March 23, 2024. Scully discussed her research on the sustainability of Chesapeake Bay oyster farming.

**Neelu Tummala**, CHI Co-Director and Assistant Clinical Professor of Surgery, GW School of Medicine and Health Sciences, participated in Climate and Health Advocacy Week on the Hill as part of the Medical Society Consortium on Climate and Health's annual conference. Tummala joined Representatives Paul Tonko, Kathy Castor, and Gwen Moore to discuss patient and community health in the face of a changing climate.

**Susan Anenberg**, Professor and Chair of Environmental and Occupational Health, Milken Institute School of Public Health, participated in Moms Clean Air Force's inaugural <u>Climate Disruption</u>, <u>Air Pollution</u>, <u>and Young People's Health summit</u>. The event provided a platform for crucial conversations amongst leaders in climate advocacy and children's health, including US EPA Administrator Michael Regan and Chelsea Clinton. Anenberg was part of a panel discussion that focused on opportunities to build a better future, where she highlighted the current efforts underway at GW that prioritize training the next generation of climate and health leaders.



Colleagues at the newly launched GW Global Food Institute, including **Tara Scully**, GW Global Food Institute Director of Curriculum Development and Associate Professor of Biology, Columbian College of Arts & Sciences, **Bill Dietz**, GW Global Food Institute Director of Research and Policy and Professor of Exercise and Nutrition Sciences, Milken Institute School of Public Health, and **John Forrer**, Director of the Institute for Corporate Responsibility and Associate Research Professor of Strategic Management and of Public Policy, GW School of Business and GW Trachtenberg School of Public Policy & Public Administration, along with a group of student researchers, released a report in collaboration with the James Beard Foundation on the immediate threats that climate change poses to independent restaurants and their supply chains. Scully was quoted in a *GW Today* article entitled, "Report: Independent Restaurants Face Climate Change Crises," which discusses the report.

**Neelu Tummala**, CHI Co-Director and Assistant Clinical Professor of Surgery, GW School of Medicine and Health Sciences, published multiple op-eds over the past year:

- Published in *The Hill* entitled, "<u>Prioritizing health: The EPA must seize the opportunity to make our air cleaner."</u> This opinion piece is focused on the anticipated announcement of whether the EPA will strengthen its air quality standards for fine particulate matter, an action which would protect health.
- Published in *Medpage Today* entitled, "<u>Are Your Patients' Allergies Worsening? Climate Change May Be at Play</u>." This opinion piece discusses how climate change is a modifiable risk factor for worsening pollen allergies and what we can do to fix this.









**Tony Y. Yang**, Endowed Professor in Health Policy and Associate Dean for Health Policy and Population Science, Milken Institute School of Public Health and GW School of Nursing, was selected for a new policy project on climate change and global public health. This is a joint initiative of the US National Academy of Medicine and the UK Academy of Medical Sciences that brings together research leaders to propose policy actions that the health research sector could take to address challenges associated with climate change.

**Neelu Tummala**, CHI Co-Director and Assistant Clinical Professor of Surgery, GW School of Medicine and Health Sciences, presented at the national <u>American College of Surgeons</u> Quality and Advocacy Conference in July 2024 on advancing sustainability initiatives in the field of surgery. The presentation was entitled, "A Practical Guide to Environmental Sustainability in Surgery."

#### EXTERNAL SERVICE FEATURES

Affiliated faculty are deeply engaged in service to the broader climate and health field, with many members serving on advisory boards, committees, and task forces:

**David Michaels**, Professor of Environmental and Occupational Health, Milken Institute School of Public Health, was selected to be a founding member of the <u>National Commission on Climate and Workforce Health</u>, which empowers employers to protect worker and business health from extreme weather conditions. The Commission is composed of business leaders with broad functional expertise as well as thought leaders across science, medicine and health policy, and will innovate solutions to mitigate climate-related health risks.

**Susan Anenberg**, Professor and Chair of Environmental and Occupational Health, Milken Institute School of Public Health, serves on the following boards and committees:

- EPA Science Advisory Board's Climate Change Science Committee
- National Academies Committee to Advise the US Global Change Research Program
- World Health Organization Global Air Pollution and Health Technical Advisory Group's Expert Working Group on Climate Change and Air Pollution
- National Academies Committee on Utilizing Advanced Environmental Health and Geospatial Data and Technologies to Inform Community Investment

Lynn R. Goldman, Michael and Lori Milken Dean, Milken Institute School of Public Health:

- Co-chairs the Task Force on Climate Change and Health established by the Association of Schools and
  Programs of Public Health (ASPPH). This Task Force brings together leaders in academic public health to
  transform public health education, research, and practice in the area of climate change and health. In
  addition to the Task Force's ongoing work, they launched a report entitled <u>Responding to the Climate</u>
  <u>Change and Health Crisis: A Framework for Academic Public Health</u>, providing recommendations for
  reducing the impacts of climate change on population health.
- Serves as one of ecoAmerica's Climate for Health Leaders, a network of America's leading health associations and institutions that are committed to climate solutions in their organizations and communities and push to make climate change a national health priority.

**Peter LaPuma**, Professor of Environmental and Occupational Health, Milken Institute School of Public Health, is part of the ASPPH Climate Change and Health Task Force, which is currently working on developing competencies and curricular resources in climate and health.

# COLLABORATIVES, PARTNERSHIPS, AND FUNDING

#### **PARTNERS**





George Washington University







Alliance for a
Sustainable Future
THE GEORGE WASHINGTON UNIVERSITY

#### **COLLABORATIVES**



The GW Climate and Health Institute is an affiliate with The Medical Society Consortium on Climate and Health, where we aim to advance our shared commitment to mitigate the harmful effects of climate change on human health.



The GW Climate and Health Institute is also part of the NAM Climate Collaborative, declaring our commitment to mitigate climate change and protect human health, well-being, and equity. The Climate Collaborative forms a public-private partnership of those across the health system committed to addressing the sector's environmental impact and strengthening its sustainability and resiliency capacities.

#### **FUNDING**

The CHI receives support from the GW Milken Institute School of Public Health and the GW Cross-Disciplinary Research Fund, along with generous donations from Dr. Ralph Mitchell and Dr. Jerry Paulson. Additionally, CHI members receive grants from a variety of sources, including NIH, NSF, NASA, NOAA, Wellcome Trust, and Bill & Melinda Gates Foundation. These funders are typically listed on their individual faculty webpages.















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