# Wildland Fires: Towards Improved Understanding and Forecasting of Air Quality Impacts -- A Workshop

## Committee

## A. R. Ravishankara

**Chair**

A.R. “Ravi” Ravishankara (NAS) is a Professor in the Departments of Chemistry and Atmospheric Science at Colorado State University. He was at National Oceanic and Atmospheric Administration’s (NOAA) Chemical Sciences Division (CSD) of Earth System Research Laboratory for nearly 30 years in Boulder, CO. There he served as the Director of CSD from 2006 through 2014, and was a Senior Scientist prior to the Directorship. Before joining to NOAA, he was at Georgia Institute of Technology in Atlanta. Dr. Ravishankara has worked over the past three and a half decades on the chemistry of the Earth's atmosphere as it relates to stratospheric ozone depletion, climate change, and regional air quality. His measurements in the laboratory and in the atmosphere have contributed to deciphering the ozone layer depletion, including the ozone hole; to quantifying the role of chemically active species on climate; and to advancing understanding of the formation, removal, and properties of pollutants. He is an author or coauthor of nearly 350 peer-reviewed publications. Dr. Ravishankara is a member of the U.S. National Academy of Sciences, as well as Fellow of the American Geophysical Union, of the Royal Society of Chemistry, of the American Association for the Advancement of Science, and of the International Union of Pure and Applied Chemistry. His many awards include the Polanyi Medal of the Royal Society of Chemistry, the Stratospheric Ozone Protection award of the U.S. Environmental Protection Agency, and the American Chemical Society's award for Creative Advances in Environmental Sciences. He is currently a co-chair of the World Meteorological Organization/United Nations Environment Programme (WMO/UNEP) Science Assessment Panel on Stratospheric Ozone and a member of the Science Advisory Panel of the Climate Clean Air Coalition of UNEP. He has served or continues to serve on many national and international committees. He is on the Editorial Board of Physical Chemistry Chemical Physics. He has previously served as an Editor of Geophysical Research Letters, and has been on the Editorial Board of Chemical Physics Research Letters and International Journal of Chemical Kinetics.

## Susan Anenberg

**Member**

Susan Anenberg is an Associate Professor of Environmental and Occupational Health and of Global Health at the George Washington University Milken Institute School of Public Health. Dr. Anenberg studies the health implications of air pollution and climate change, from local to global scales. Dr. Anenberg has been a Co-Founder and Partner at Environmental Health Analytics, LLC, the Deputy Managing Director for Recommendations at the U.S. Chemical Safety Board, an environmental scientist at the U.S. Environmental Protection Agency (EPA), and a senior advisor for clean cookstove initiatives at the U.S. State Department. Her research has been published in top academic journals such as Science, Nature, and Lancet Planetary Health. She has also led or contributed to many science-policy reports on air quality and climate change published by U.S. EPA, World Bank, World Health Organization, United Nations Environment Programme, and others. She received her PhD in Environmental Science and Engineering and Environmental Policy from the University of North Carolina (UNC) Gillings School of Global Public Health in 2011. She also received an MS in Environmental Science and Engineering from UNC in 2008 and a BA in Biology and Environmental Sciences from Northwestern University in 2004. Dr. Anenberg was a National Academies Mirzayan Science and Technology Policy Fellow in 2009, working with the Board on Atmospheric Sciences and Climate.

## Michael T. Benjamin

**Member**

Michael T. Benjamin has over 35 years of experience in environmental and earth sciences, with a focus on air quality and air pollution control. He is currently Chief of the Air Quality Planning and Science Division at the California Air Resources Board (CARB). In this capacity, he oversees a staff of approximately 170 scientists and engineers who are responsible for a broad range of air quality programs. These include development of State Implementation Plans for California and associated technical work including air quality data analysis, emissions inventory development, and air quality modeling. Other areas under Dr. Benjamin’s purview include consumer products regulatory development as well as oversight of California’s smoke management program. Since joining CARB in 1993, Dr. Benjamin has served in multiple roles across the agency, most recently as Chief of the Monitoring and Laboratory Division where he oversaw California’s statewide network of 200 ambient air quality monitors, and associated laboratory operations. In his career at CARB, Dr. Benjamin has also served as Assistant Division Chief of the Research Division, overseeing development of the agency’s extramural and in-house research programs. Prior to joining CARB, Dr. Benjamin worked for five years at Columbia University’s Lamont-Doherty Earth Observatory conducting research using chlorofluorocarbons and other tracers to better define the pathways, timescale, and transport for the spreading of deep water from its source

## Narasimhan Larkin

**Member**

Narasimhan “Sim” Larkin is a Research Meteorologist and Team Leader with the U.S. Forest Service’s Pacific Wildland Fire Sciences Laboratory in Seattle, Washington. He also serves as an Affiliate Associate Professor at the University of Washington’s School of Forest and Environmental Sciences. At the U.S. Forest Service, Dr. Larkin conducts research in fires, fire emissions, smoke, and air quality with an emphasis on building scientific models and tools to aid in land, fire, and air quality management. Tools and systems built by Dr. Larkin are in use daily across the U.S., Canada, and in other countries for air quality smoke impact monitoring and smoke forecasting. These include the BlueSky smoke modeling framework and the BlueSky Playground interactive emissions and smoke modeling web tool. Dr. Larkin is the senior scientific advisor to the federal Interagency Wildand Fire Air Quality Response Program led by the U.S. Forest Service. His work also forms the basis of the wildland fire component of the U.S. Environmental Protection Agency’s National Emissions Inventory. He is a co-lead on the large multi-agency fire field campaign, the Fire and Smoke Modeling Evaluation Experiment (FASMEE). He received his PhD from the University of Washington studying the El Nino Southern Oscillation climate pattern.

## Luke P. Naeher

**Member**

Luke P. Naeher is a professor in the University of Georgia (UGA) College of Public Health, Department of Environmental Health Science. His recent areas of research include: 1) an exposure assessment and epidemiological study of occupational fine inhalable particulate matter (PM2.5) and carbon monoxide (CO) exposures (including biomarkers of exposure) and related respiratory health markers in southeastern US forest firefighters, 2) an exposure assessment and epidemiological study of pregnant women and an occupational cohort investigating PM2.5, CO, nitrogen dioxide, and volatile organic compounds exposures in air and environmental chemicals measured in blood and urine, and related respiratory health markers in Trujillo, Santiago de Chuco, San Marcos, Junin and Ayacucho, Peru, and 3) an exposure assessment and environmental epidemiological study of UGA students exposed to second hand smoke in outdoor settings in Athens, GA. He is also currently a joint primary investigator on a National Institutes of Health Fogarty Regional GEO Health Hub Centered in Peru [http://www.geohealthperu.org/], and a co-investigator on The Household Air Pollution Intervention Network (HAPIN) Trial, which is an international multi-center study aimed at assessing the impact of a liquefied petroleum gas (LPG) cooking stove and fuel intervention on health. HAPIN Trial centers are located in four countries: Guatemala, India, Peru and Rwanda. [http://www.hapintrial.org/]. Dr. Naeher received his PhD in Epidemiology and Public Health from Yale University.

## Carsten Warneke

**Member**

Carsten Warneke is a Senior Research Scientist at the Cooperative Institute for Research in Environmental Sciences at the University of Colorado and the National Ocean and Atmospheric Administration (NOAA) Earth Systems Research Laboratory. He is the leader of the Volatile Organic Compound (VOC) group in the Chemical Sciences Division and responsible for planning and leading large-scale NOAA field experiments for air quality and climate research. He is currently one of the principle investigators of the upcoming NOAA Atmospheric Emissions and Reactions Observed from Megacities to Marine Areas (AEROMMA) 2021 field experiments looking at air quality in urban areas and most notably principle investigator of the NOAA/NASA led Fire Influence on Regional to Global Environments and Air Quality (FIREX-AQ) campaign, which is a multi-year, multi-agency measurement campaign focused on the impact of fires on climate and air quality from western North American wild fires and southeastern prescribed and agricultural fires. His main expertise is in air pollution on regional to global scales and his focus lies on the science of VOCs in the atmosphere. Dr. Warneke has a PhD in Physics from the University of Innsbruck, Austria in 1998. Afterwards he spent 3 years as a post-doc at the University of Utrecht, Holland before moving to the University of Colorado, Boulder and the NOAA Earth Systems Research Laboratory in Boulder in 2001.

## Christine Wiedinmyer

**Member**

Christine Wiedinmyer is the Associate Director for Science at the University of Colorado Boulder’s Cooperative Institute for Research in Environmental Sciences (CIRES). A former scientist at the National Center for Atmospheric Research (NCAR), Dr. Wiedinmyer holds a Bachelor of Science in Chemical Engineering from Tulane University and a PhD in Chemical Engineering from the University of Texas at Austin. Dr. Wiedinmyer’s research focuses on the identification and quantification of various emission sources and modeling the transport and fate of emitted pollutants in the atmosphere. She is the creator of the Fire INventory from NCAR (FINN) model that estimates emissions of pollutants from open burning globally; the FINN emissions estimates have been applied in numerous air quality and climate studies to evaluate their impacts. Further, Dr. Wiedinmyer is an expert in interdisciplinary research to connect her research to other areas of societal relevance, such as public health, land management, and climate. She is the recipient of the Walter Orr Roberts Lecturer for Interdisciplinary Sciences from the American Meteorological Society in 2014 “for research on biomass burning and its impact on the atmosphere and terrestrial biosphere, and bridging atmospheric science, biology, engineering, public health and other disciplines.” Dr. Wiedinmyer is also a founding member and a current Board member of the Earth Science Women's Network (ESWN). Dr. Wiedinmyer was a member of the National Academies Committee on the Future of Atmospheric Chemistry Research, January 2015 – August 2016.