



EMERGING SCIENCE FOR ENVIRONMENTAL HEALTH DECISIONS

AGENDA

Modeling the Health Risks of Climate Change

NOVEMBER 3–4*, 2014 ■ MONDAY 8:30–5:00, TUESDAY 8:30–NOON

PEW CHARITABLE TRUST CONFERENCE CENTER, THE AMERICAS ROOM
901 E STREET, NW, WASHINGTON, DC

THIS WORKSHOP WILL BE WEBCAST

CLIMATE CHANGE THROUGH SHIFTING WEATHER PATTERNS, increases in frequency and intensity of heatwaves and other extreme weather events, rising sea levels, and ocean acidification among other environmental effects, poses risks to human health and well-being. Moreover, these risks occur against a backdrop of changing socioeconomic conditions, medical technology, population demographics, health status, environmental conditions, and other factors important for determining health effects. Because these factors and climatic changes will vary in time and space, health impact models will need to be flexible so that they can reflect a range of plausible future scenarios, as well as systems-based so that they can capture important interactions amongst key driving forces. Robust models can inform approaches to improve adaptive capacity and prevent adverse health impacts, and also inform national and international discussions about climate policies and the economic consequences of action and inaction.

However, the development of health risk models of climate change has been slow. Inherent uncertainty in what health and socioeconomic trends the future will bring, limited research on the links between climate change events and health outcomes, and the variability and complexity human health and disease are a few of the hurdles that health risk modelers are endeavoring to overcome. Developing future scenarios of population demographics and infrastructure (e.g. food and water quality delivery systems, infectious disease diagnosis and management) is a critical part of constructing such robust and useful predictive models. Applying integrated

systems-based approaches to health modeling may also provide useful insights into vulnerabilities and potential interventions to protect people's health. A US Global Change Research Program Special Report on climate and health will provide the first federal integrated effort to model health outcomes and exposures related to a range of climate change related events including increased heat, air pollution, and populations of arthropod disease vectors (e.g. ticks and mosquitoes). These models are a key starting point for understanding health risks of climate change. However careful consideration and cross-disciplinary collaboration is needed for their further development and refinement.

THIS MEETING WILL BRING TOGETHER environmental health researchers, climate change modelers, and public health experts and practitioners to explore new approaches to modeling the human health risks of future climate change. Speakers will discuss the state-of-development of health risk models and approaches to incorporate future scenarios of exposure-response and human system vulnerabilities. Participants will also explore the capability to generalize and scale-up health risk models, and potential approaches to integrate health risks into models of aggregated impact of climate change. Discussions will highlight research gaps, lessons learned, research needs, and potential next steps to improve health risks models of climate change.

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MONDAY, NOVEMBER 3, 8:30AM–5:00PM

8:30 Welcome and Opening Remarks—William Farland[†], *Colorado State University*, and John Balbus, *National Institute of Environmental Health*

SESSION 1 HUMAN HEALTH RISKS OF CLIMATE CHANGE: STATE OF KNOWLEDGE

8:45 Where We Are: Hurdles and Opportunities—Jan Semenza, *European Centre for Disease Control and Prevention (ECDC)*

9:15 Emerging Models, Datasets, and Applications—Ben Zaitchik, *Johns Hopkins University*

9:45 Using Health Risk Models to Improve Community Preparedness—George Luber, *Centers for Disease Control and Prevention (CDC)*

10:15 Break

SESSION 2 HEALTH RISK MODELS OF CLIMATE CHANGE: STATE OF DEVELOPMENT

Moderator: Linda Wennerberg, *National Aeronautics and Space Administration (NASA)*

10:30 Quantitative Risk Assessment Approach to Modeling the Health Impacts of Climate Change—Sari Kovats, *London School of Hygiene & Tropical Medicine (LSHTM)*

11:00 Climate and Health Effects of Heat Stress and Air Pollution—Michelle Bell, *Yale University*

11:30 Climate and Water-Borne Infectious Diseases—Juli Trtanj, *National Oceanic and Atmospheric Administration (NOAA)*

12:00 Climate and Vector-Borne Diseases—Nick Ogden, *Public Health Agency of Canada*

12:30 Lunch on your own

1:15 Panel Discussion on Health Risk Models—Limitations and Opportunities
Discussants: Charles Benjamin Beard, *CDC*, Mary Hayden, *University Corporation for Atmospheric Research*, Erin Lipp, *University of Georgia*, and Session 2 Speakers

SESSION 3 HUMAN SYSTEMS APPROACH TO UNDERSTANDING FUTURE VULNERABILITIES

Moderator: Gary Geernaert, *Department of Energy (DOE)*

2:15 Systems Thinking in Health: A Population-based Approach to Climate Change Impact—Georges Benjamin, *American Public Health Association*

2:45 Systems Approach to Climate Change, Agriculture, and Human Health—Joshua Elliott, *University of Chicago* and *Argonne National Laboratory*

3:15 Urbanization, Climate Change, and Human Health—Richard Jackson, *University of California, Los Angeles*

3:45 Break

4:00 Panel Discussion on Systems Thinking and Modeling the Health Impacts of Climate Change
Discussants: Molly Brown, *NASA*, Gregory Glass, *University of Florida*, Session 3 Speakers

5:15 Adjourn Day One

TUESDAY, NOVEMBER 4, 8:30AM–NOON*

SESSION 4 INCORPORATING HEALTH RISKS INTO THE AGGREGATED IMPACT OF CLIMATE CHANGE

Moderator: Kristie Ebi, *ClimAdapt, LLC*

8:30 Welcome and Opening Remarks—Kristie Ebi, *ClimAdapt, LLC*

8:50 Integrating Climate Change Impact Models: Where We Are and Where We Need To Go—Anthony Janetos, *Boston University*

9:20 Panel Discussion on Conceptual Directions for Research on Integrating Climate Change Impact Models
Discussants: Stéphane Hallegatte, *World Bank*, Anthony Janetos, *Boston University*, Sari Kovats, *LSHTM*, Jan Semenza, *ECDC*

10:15 Break

10:30 Panel Discussion on Practical Next Steps toward Improving Climate Change Impact Models
Discussants: John Balbus, *NIEHS*, Anne Grambsch, *EPA*, Juli Trtanj, *NOAA*, Robert Vallario, *DOE*, Peter Berry, *Health Canada*

11:45 Closing Comments - John Balbus, *NIEHS*

12:00 Adjourn Meeting*

* Members of the ESEH committee and government liaison group will meet Tuesday, November 4, 1:00–3:00pm.

[†] indicates a member of the Standing Committee on Use of Emerging Science for Environmental Health Decisions.

For more information and to subscribe for updates, please visit <http://dels.nas.edu/envirohealth>
Emerging Science workshops are free and open to the public.

About the Committee

At the request of the National Institute of Environmental Health Sciences (NIEHS), the National Research Council formed the Standing Committee on Use of Emerging Science for Environmental Health Decisions to facilitate communication among government, industry, environmental groups, and the academic community about scientific advances that may be used in the identification, quantification, and control of environmental impacts on human health.

