

### **Michigan's public health response to climate change**

- **An overview of the link between climate change and health effects**  
Molly Polverento, president-elect, Michigan Public Health Association
- **Developing the adaptive response plan**  
Dr. Lorri Cameron, Department of Community Health
- **Climate change, heat waves and health: Current research in Southeast Michigan**  
[Jalonne White-Newsome](#), University of Michigan School of Public Health
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[Dr. Asli Aslan-Yilmaz and Marc Verhoughstraete](#), Fisheries and Wildlife, Michigan State University

### **SESSION ABSTRACT**

Climate change has been recognized to have major impacts on human health, both directly through storms and extreme weather events, and more indirectly by degrading air and water quality and increasing the opportunity for the spread of infectious diseases. In this session, the speakers will review what is currently known about the health effects of climate change and how the public health community is responding to this threat, both nationally and here in Michigan. They will also discuss two areas of specific interest and research in Michigan, extreme heat events and water quality.

### **PRESENTATION ABSTRACTS:**

#### **An overview of the link between climate change and health effects**

Ms. Polverento will provide an overview of the possible impacts of climate change on public health. This will include issues around communicable and infectious diseases, food and water quality and supply, heat-related events, and mass migrations.

#### **Developing the adaptive response plan**

The Michigan Department of Community Health (MDCH) is one of several state health departments developing an adaptive plan to address climate change effects on public health. As part of our plan development, MDCH is working with Michigan's state and local health, environmental, and emergency response groups, as well as non-governmental organizations and academia to identify the important issues, data sources, strengths and gaps in public health's ability to adapt and respond to climate change events. The presentation will cover the important components of public health in Michigan, their roles, strengths and weaknesses in responding to climate change, and further development of the state adaptive plan.

#### **Climate change, heat waves and health: Current research in Southeast Michigan**

Climate change is projected to increase the frequency and intensity of heat events, and heat is already one of the principal weather-related causes of mortality in the United States. Research has shown that those that are most vulnerable to heat include the elderly, the poor, and racial minorities. The built environment, specifically areas without green space or dense urban areas, can also make people more vulnerable to heat related illnesses. With grants from The University of Michigan's Graham Environmental Sustainability Institute, and the U.S. Centers for Disease Control and Prevention, the University of Michigan Heat Wave research team, including members from the Schools of Public Health, Natural Resources and Environment, and the College of Engineering, has developed specific research projects to investigate climate change, heat and equity. Our Michigan-based work has three specific aims: to conduct an interview-based needs assessment, to create a heat vulnerability mapping tool and to develop a system that can help predict weather patterns that could cause negative health effects. This presentation will highlight some of the ongoing projects and preliminary findings. We will also discuss how this research can inform future policy, provide a foundation to create prototype tools that can be used to predict

future heat events, and identify adaptive practices and mitigation strategies that can be integrated into the current climate change plan for Michigan.

### **Water quality and climate change**

The climate of the Midwest has become measurably altered over the last half century. The average air temperatures have significantly increased. Heavy rains and increased yearly precipitation have led to elevated risks and occurrences of flooding over the last century. Recent research undertaken in the Great Lakes Basin has identified pathogens such as viruses (Adenoviruses, Enteroviruses and Noroviruses), bacteria (*Escherichia coli*, Salmonella, Shigella, and Clostridium) and protozoa (Giardia and Cryptosporidium) which are able to persist and cause water related public health problems. Under the current precipitation and temperature assumptions of climate change in the Great Lakes, the likelihood of increased gastrointestinal illnesses associated with waterborne diseases is expected to increase. Aging infrastructure and combined sewer overflow (CSO) systems will face increased pressure and leading to greater stress to the Great Lakes. For instance, Michigan has 158 CSO outfalls which discharged  $2.6 \times 10^{10}$  gallons of untreated or partially treated sewage to surface waters in 2007. Another example of failing infrastructure that poses a direct public health risk is drinking water systems. During record precipitation levels, a Cryptosporidium outbreak occurred throughout Milwaukee in which 54 people died due to a failure in the drinking water treatment system. As the science progresses so does the ability to quickly detect emerging pathogens. According to surveillance data from the last decade, drinking water outbreak detection agents are moving towards the use of Norovirus and Cryptosporidium. Although the means for detecting pathogens is advancing, there is a greater need to reduce the sources of diseases (i.e. repair/replace aging infrastructure) which has been estimated at \$12 billion for Michigan alone.

## **PRESENTER BIOSKETCHES**

### **Molly Polverento**

Molly Polverento, MS, is President-Elect of the Michigan Public Health Association (MPHA) and an Outreach Specialist within the Michigan State University College of Human Medicine. Ms. Polverento is also active in other public health organizations, including the Michigan Asthma Advisory Committee. Prior to joining MSU, Ms. Polverento was the Health Policy Director for the Michigan Environmental Council, where she worked with legislators and other advocates on policies relevant to public health and climate change.

### **Lorri Cameron**

Dr. Cameron has an MPH in Epidemiology from the U of Michigan and a PhD in Environmental Epidemiology from John Hopkins, and came to the Michigan Department of Community Health in 1997 after 10 years in occupational epidemiology research at the National Institute for Occupational Safety and Health. She is Manager of the Epidemiology and Surveillance section of the Division of Environmental Health which provides environmental and injury epidemiology support to projects in the Division. She is Project lead on a grant from the Association of State and Territorial Health Officials to develop a state plan to prepare for health effects of climate change.

### **Jalonne White-Newsome**

Jalonne White-Newsome is a doctoral student in environmental epidemiology at the University of Michigan School of Public Health. She is interested in research on various health outcomes associated with climate change, extreme heat events and environmental justice. She received her BS in chemical engineering from Northwestern University in Evanston, IL. While working as a project engineer for United States Gypsum in Dallas, TX, she completed her Master's in Environmental Engineering at Southern Methodist University. She went on to work as a production supervisor for Ferro Corporation in Fort Worth, TX. After leaving Texas, she worked for Maryland Department of the Environment as a Public Health Engineer. Most recently, Jalonne was the Environmental Manager for Global Engine Manufacturing Alliance, an engine

manufacturing plant in Dundee, MI. She is a recipient of a NORA fellowship, Rackham Merit Fellowship, and a fellow in the Environmental Leadership Program.

**Asli Aslan-Yilmaz**

Dr. Asli Aslan Yilmaz is a post doctoral fellow in the Water Quality and Health Laboratories at Michigan State University affiliated with the Center for Water Sciences and Dr. Joan Rose's laboratory. She received her B.S (1999) from Istanbul University, Faculty of Biological Sciences, her MSc (2002) and Ph.D. (2008) from Istanbul University, Institute of Marine Sciences and Management. Her research interests are mainly focused on the application of molecular methods for monitoring microbial pollution in global waters. She is currently the coordinator of IWA Health Related Microbiology Group's new initiative, International Collaboration for Sewage (IC Sewage). She is experienced in long-term recreational water quality monitoring at coastal and estuarine ecosystems and development of alternative pollution indicators for microbial source tracking.

**Marc Verhougstraete**

Marc Verhougstraete is a Ph.D. student working under Dr. Joan B. Rose in the Water Quality, Environmental, and Molecular Microbiology Laboratory. By addressing the connections between climate variability and nearshore health of the Great Lakes, Marc hopes to reduce the climate-related human health risks arising from waterborne diseases through communication, identification, and modeling of Michigan's complex surface water systems.