

Climate Change Impacts on Health and Welfare in Mid-Western States

July 15, 2008

E.P.A. Assessment

The final EPA/CCSP report assessing the impacts of climate change on human health and welfare finds that mid-western states will incur steep costs as communities along large rivers and in urban areas will be particularly hard hit by the impacts of a changing climate. **Flooding and extreme weather will threaten homes, infrastructure and the economies of Midwest communities. Cities will experience increased health problems as rising temperatures are amplified by urban development.**

The following are verbatim excerpts on major findings of concern to mid-western states. A complete copy of the final report is available for public review online at <http://www.climate-science.gov/Library/sap/sap4-6/final-report/default.htm>

“Populations in the ... Great Lakes regions may experience increased strain on water resources and availability due to climate change. More intense heat waves and heat-related illnesses may take place in regions where extreme heat events already occur, such as interior continental zones of the U.S. High-density urban populations will experience heightened health risks, in part due to the heat-island effect. In addition, increased demand for electricity during summers may lead to greater air pollution levels.” (Chapter 2, Page 23)

Heat

“Populations in Northeastern and Midwestern U.S. cities are likely to experience the greatest number of illnesses and deaths in response to changes in summer temperatures.” (Chapter 2, Page 3)

“Groups particularly vulnerable to heat-related mortality include the elderly, very young, city-dwellers, those with less education, people on medications such as diuretics, the socially isolated, the mentally ill, those lacking access to air conditioning, and outdoor laborers.” (Chapter 2, Page 5)

“...heat can exacerbate chronic health conditions...including cardiovascular, renal, and respiratory diseases; diabetes; nervous system disorders; and other causes not specifically described as heat-related.” (Chapter 2, Page 5)

“Urban heat islands may increase heat-related health impacts by raising air temperatures in cities 2-10°F over the surrounding suburban and rural areas.” (Chapter 2, Page 5)

“Warming is virtually certain to increase energy demand in U.S. cities for cooling...Demands for cooling during warm periods could jeopardize the reliability of service in some regions by exceeding the supply capacity.” (Chapter 3, Page 6)

“...increasing global temperatures will likely increase rates of salmonellosis (salmonella).” (Chapter 2, Page 10)

Air Pollution

“It is well-established that higher temperatures in urban areas are related to higher levels of ozone which cause respiratory and cardiovascular problems.” (Chapter 3, Page 5)

“Vulnerability to ozone health effects is greater for persons who spend time...outdoors...Thus, children, outdoor laborers, and athletes may be at greater risk.” (Chapter 2, Page 14)

“Climate change has caused an earlier onset of the spring pollen season...it is reasonable to infer that allergenic diseases caused by pollen, such as allergic rhinitis, also have experienced concomitant changes in seasonality.” (Chapter 2, Page 15)

Floods

*“Given their **location**, the underlying vulnerability of some communities is inherently high just as their adaptive capacity is similarly limited... settlements along floodplains of large rivers are particularly vulnerable due to projections of increased variability in precipitation.” (Chapter 5, Page 6)*

“...storms, floods, and other severe weather events may affect other infrastructure, including sanitation systems, transportation, supply lines for food and energy, and communication. Exposed structures such as bridges and electricity transmission networks are especially vulnerable.” (Chapter 3, Page 5)

“...flooding can overwhelm sanitation infrastructure and lead to water-related illnesses.” (Chapter 1, Page 19)

“These heavy rainfall events have increased in frequency by as much as 100% across much of the Midwest and Northeast over the last century. These findings are consistent with observed warming and associated increases in atmospheric water vapor. The intensity of precipitation events is projected to increase.” (Chapter 1, Page 12)

Severe Weather and Health

“Storm events and flooding may result in the contamination of food crops (especially produce such as leafy greens and tomatoes) with feces from nearby livestock or feral animals. Therefore, changing climate or environments may alter the transmission of pathogens.” (Chapter 2, Page 10)

“Anxiety and depression, the most common mental health disorders, can be directly attributable to the experience of the event (i.e. being flooded) or indirectly during the recovery process. These psychological effects tend to be much longer lasting and can be worse than the physical effects experienced during an event and its immediate aftermath.” (Chapter 2, Page 7)

Economics

“Climate change...can affect a settlement’s economic base if it is sensitive to climate, as in areas where settlements are based on agriculture, forestry, water resources, or tourism.” (Chapter 3, Page 6)

“The insurance sector is one of the most adaptable of all economic sectors, and its exposure to costs from severe storms and other extreme weather events is likely to lead it to withdraw (or to make much more expensive) private insurance coverage from areas vulnerable to climate change impacts, which would encourage both businesses and individual citizens to consider other locations over a period of several decades.” (Chapter 3, Page 8)

“...people can purchase insurance only against the monetary losses associated with floods and hurricanes; hence, insurance premiums will not capture the entire value placed on avoiding these events.” (Chapter 4, Page 38)

“Climate change can add to stress on social and political structures by increasing management and budget requirements for public services such as public health care, disaster risk reduction, and even public security.” (Chapter 3, Page 6)

Vulnerable Groups

“Children’s small body mass to surface area ratio...make them more vulnerable to heat-related morbidity and mortality...their increased breathing rates...time spent outdoors, and developing respiratory tracts heighten their sensitivity to harm from ozone air pollution...children's relatively naïve immune systems increase the risk...from water and foodborne diseases...Children may also be more vulnerable to psychological complications of extreme weather events related to climate change.” (Chapter 2, Page 23)

“The elderly are identified in many health assessments as more vulnerable than younger age groups to a range of health outcomes associated with climate change.” (Chapter 1, Page 15)

Recreation

“Slightly more than 90% of the U.S. population participates in some form of outdoor recreation, representing nearly 270 million participants, and several billion days spent each year in a wide variety of outdoor recreation activities...the number of people participating in outdoor recreation is highest for walking (67%), visiting a beach or lakeshore or river (62%), sightseeing (56%), swimming (54%) and picnicking (49%).” (Chapter 4, Page 28)

“Weather conditions are considered one of the four greatest factors influencing tourism visitation. In addition, much outdoor recreation and tourism depends on the availability and quality of natural resources. Consequently, climate change can also indirectly affect the outdoor recreational experience by affecting the quality and availability of natural resources (and, thus, the availability and quality of recreational experience) used for recreation such as beaches, forests, wetlands, snow, and wildlife.” (Chapter 4, Page 29)

“...some activities are likely to be unambiguously harmed by even small increase in global warming, such as snow and ice-dependent activities.” (Chapter 4, Page 29)

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National and Regional Experts

EPA Contacts

Roxanne Smith

Press Officer at EPA

(202) 564-4455

smith.roxanne@epa.gov

Joel Scheraga

EPA National Program Director for the Global Change Research Program in the Office of Research and Development

(202) 564-3385

Scheraga.Joel@epamail.epa.gov

Dr. Kristie Ebi

Lead author on the report and independent consultant

703-304-6126

krisebi@essllc.org

Howard (Howie) Frumpkin

CDC Director of the National Center for Environmental Health

hfrumpkin@cdc.gov

Mike McGeehin

CDC Chief, Division of Environmental Hazards and Health Effects (NCEH)

mmcgeehein@cdc.gov

CDC Main Press Line: (404) 639-3286

Air Quality Experts/Sources

Joel Schwartz

Professor of Environmental Epidemiology, Harvard

617-384-8752

jschwartz@hsph.harvard.edu

Dr. Schwartz's studies are cited in the CCSP report.

Jonathan Ward

Environmental Toxicology, University of Texas Medical Branch

409-772-9109

jward@utmb.edu

He's very good on chronic exposure to air pollution—especially ozone. He can talk on the particular impacts on children. Part of the National Institute of Environmental Health Science.

Water Quality Experts/Sources

Dr. Joan Rose

Water Quality Expert

Michigan State University

Dr. Rose can talk about the wastewater and other water quality issues that are the result of extreme precipitation.

517-432-4412

rosejo@msu.edu

Office: Fisheries & Wildlife

Public Health Professionals/Experts

Georges Benjamin

Executive Director, American Public Health Association

Executive Assistant: Alice Aughtry at 202-777-2430 or alice.aughtry@apha.org.

The APHA made the Health Impacts of Climate Change its theme for 2008. Benjamin testified Before Congress on the health impacts of climate change—including the specific regional impacts.

Dr. Mark Wilson

Professor, Epidemiology

Director, Global Health Program

Professor, Ecology and Evolutionary Biology

University of Michigan

wilsonml@umich.edu

Office: (734) 936-0152

Dr. Jonathan Patz , M.D., MPH

University of Wisconsin

608-262-4775 or 608-250-2526.

patz@wisc.edu

Dr. Patz is available to answer questions, but is currently in Germany and will only be reachable by cell, 608-698-7380. The time difference is 9 HOURS LATER than the Pacific time zone and SIX HOURS later than the Eastern time zone.

Patz has served as Co-chair for the Health Expert Panel of the US National Assessment on Climate Variability and Change, Convening Lead Author for the United Nations/World Bank Millennium Ecosystem Assessment, and Lead author on several United Nations Intergovernmental Panel on Climate Change (IPCC) reports and World Health Organization (WHO) monographs on climate change.

More bio info: <http://www.sage.wisc.edu/people/patz/patz.html>

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