Climate Change Impacts on Health and Welfare in Northeastern States
July 15, 2008

E.P.A. Assessment

The final draft of an upcoming EPA/CCSP report assessing the impacts of climate change on human health and welfare finds that northeastern states will incur steep costs due to heat stress and severe weather. Urban areas, in particular, will suffer health affects related to heat and air pollution. Flooding will be an increasing problem for coastal communities and those along rivers.

The following are verbatim excerpts from major findings of concern to northeastern states. A complete copy of the draft report is available for public review on line at http://www.climatescience.gov/Library/sap/sap4-6/sap4-6-draft3.pdf.

Heat and Air Pollution

"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)

"The northern latitudes of the United States are likely to experience the largest increases in average temperatures; they will also bear the brunt of increases in ground-level ozone and other airborne pollutants. Populations in … Northeastern cities are likely to be disproportionately affected by heat related illnesses as heat waves increase in frequency, severity, and duration." (Executive Summary, Page 5)

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

"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)

"*[In 50 eastern cities]* a*verage ozone concentrations were projected to increase by 4.4 ppb (7.4%) in the 2050s; the range was 0.8% to 13.7%. In addition, ozone red alert days could increase by 68%. Changes in health impacts were of corresponding magnitude." (Chapter 2, Page 21)*

"…heat can exacerbate chronic health conditions, and several analyses have reported associations with cause-specific mortality, including cardiovascular, renal, and respiratory diseases; diabetes; nervous system disorders; and other causes not specifically described as heat-related." (Chapter 2, Page 5)

"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)

"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)

Rain and Drought

"Residents of low-lying coastal regions, which are common locations for hurricane landfalls and flooding, are particularly vulnerable to the health impacts of climate change…coastal areas may also experience the combination of sea level rise chronically threatening water supplies and periodic infrastructure damage from more intense storms." (Chapter 2, Page 22)

"The seasonal 'center of stream flow volume' (i.e., the date at which half of the expected winter-spring stream flow has occurred) also appears to be advancing by on average one day per decade for streams in the Northeast. This trend is projected to continue, with more precipitation falling as rain rather than snow." (Chapter 1, Page 9)

"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, particularly in high latitude areas." (Chapter 1, Page 11)

"…many current reservoirs are not designed to handle huge spring inflows, and thus this water may be 'spilled,' which lowers reservoir levels during the summer season." (Chapter 4, Page 31)

"Analyses using several coupled global circulation models project an increased frequency of droughts lasting a month or longer in the Northeast." (Chapter 1, Page 12)

Socio-economic Impacts

"Higher temperatures also affect costs of living and business operation by increasing costs of climate control in buildings." (Chapter 3, Page 6)

"Vulnerabilities may be especially great for rapidly-growing and/or larger metropolitan areas, where the potential magnitude of both impacts and coping requirements could be very large." (Chapter 3, Page 7)

"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)

"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)

"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 14)

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)

"…long-term higher increases in temperature may eventually have adverse effects on activities like walking, and result in sufficient sea level rise to reduce publicly accessible beach areas, just at the time when demand for beach recreation to escape the heat is increasing. In contrast, 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)

"Sea level rise reducing beach area and beach erosion are concerns with climate change that may make it difficult to accommodate the increased demand for beach recreation." (Chapter 4, Page 31)

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 Heath Effects (NCEH)
mmcgeehin@cdc.gov

CDC Main Press Line: (404) 639-3286

Air Quality Experts/Sources
Joel Schwartz
Professor of Environmental Epidemiology, Harvard
617-384-8752
jschwrtz@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

Paul Kirshen
Tufts University-Civil and Environmental Engineering,
617-627-5589 or paul.kirshen@tufts.edu or www.cee.tufts.edu/pkirshen
Kirshen can talk about many aspects of water and climate change. He can discuss water supply and wastewater issues, coastal flooding and the infrastructure costs of climate change—both damage and for adaptation.

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. Dennis McBride
Health Director, City of Milford, Connecticut
admcbride@sbcglobal.net
(203) 783-3314

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