Knowledge Building Series: Climate Change, Human Health and Welfare

Part 3 of 3

2011

U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 8

Can Climate Change Affect my Health and Welfare?

Climate change is already influencing our physical environment in the Mountain West and Great Plains states and the affect on people's health and welfare is expected to progressively increase as greenhouse gases continue to buildup in the atmosphere. We will experience high temperatures, extreme weather events, the spread of disease, drought, and other impacts. Many climate impacts are expected to increase in severity. It is important for us to be prepared, focus on adapting to these changes and address the impacts on vulnerable populations, including children, the elderly and the poor, who will be disproportionately impacted.

(Source: U.S. Global Change Research Program (USGCRP)—Global Climate Change Impacts in the United States)

"The global average temperature since 1900 has risen by about 1.5ºF. By 2100, it is projected to rise another 2 to 11.5ºF"
-USGCRP pg. 9

What Health Impacts Can We Expect?

Climate change will have different impacts across the United States due to geographic and cultural differences. In the Mountain West and Great Plains, the following impacts are anticipated:

Environmental and Health Issues	Possible Impacts
Extreme Heat and Heat waves	Increased illnesses like heat exhaustion and kidney stones; increased mortality particularly in urban areas where temperatures can be 10° warmer
Poor Air Quality Increased ground-level ozone (a component of smog)	Short-term harm to lungs, damage to lung cell lining, increased cases and deaths caused by asthma
Floods	Flood related injuries, increased waterborne disease, and contaminated drinking water
Wildfires	Eye and respiratory illness due to air pollutants, direct injuries and burns that could potentially lead to death
Disease Transmission through food, water and insects	Increased likelihood of food-borne diseases due to Salmonella and other bacteria; cases of Giardia and Cryptosporidium in drinking and recreational waters after heavy downpours; mosquitos, ticks and rodents carry West Nile virus, equine encephalitis, Lyme disease, and hantavirus
Increased Allergenic Pollen	Prolonged allergy season

(Source: USGCRP Report, pgs. 90-96)

Taking Action - What Can I Do?

Successful climate adaptation relies on research and education. It is critical that individuals use this knowledge to change behavior and become aware of how to adapt to the impacts of climate change.
(*Source: USGCRP Report-Concluding Thoughts)*

How to Beat the Heat

- Drinking plenty of non-carbonated liquids like water or electrolyte-enriched drinks, even when you don't feel thirsty.
- Avoid alcohol, caffeine or drinks with a lot of sugar because they help speed up fluid loss.
- Stay indoors, preferably in air-conditioned areas like malls and movie theaters. Even a few hours can help cool your body's temperature.
- If you feel very hot, cool off by taking a cool bath or shower. Opening a window or using a fan may not prevent heat-related illness. Do not try to cool children in ice water or alcohol baths.
- Wear lightweight, light-colored, loose fitting clothing. Wear a hat or use an umbrella, and put on sunglasses.
- Limit physical activity to morning and evening hours. Avoid physical activity between 10 am and 3 pm, the hottest part of the day.
- Check on older adults, infants and young children frequently.

(Source: County of Santa Clara Public Health Department)

How to Prevent Mosquito Bites– The 4 D's

Dawn/Dusk: Avoid being outside at these times because this is when mosquitoes are most active

Drain: Get rid of standing water in your backyard. Be sure to drain water from old tires, flower pots and clogged gutters. These are breeding areas for mosquitoes. Change water in bird baths weekly to keep it fresh.

DEET: Use a bug repellent with DEET when outside. Use lower concentrations on children. Other options are available and approved by the Center of Disease Control and Protection. These repellents should contain picaridin and lemon or eucalyptus oil.

Dress: Wear loose fitting, lightweight, and long sleeved clothes. To get extra protection, spray clothes with insect repellent.

(Source: Colorado Department of Health)

Mosquitoes and West Nile

As temperatures increase, the range of disease-carrying mosquitoes will spread further northward. For example, West Nile Virus requires a minimum temperature of about 58 °F for development, and longer seasons with warmer summers may expand the territory of disease carrying mosquitoes. (*Source: Reisen W, Brault AC. West Nile virus in North America: perspectives on epidemiology and intervention. Pest Manag Sci. 2007 Jul;63(7):641-6)*

In the summer of 1999, a new strain of West Nile Virus emerged in North America. The highest transmissions of this virus were during the summers of 2002 to 2004 in the U.S. and were linked to above-average temperatures. (Source: *Journal of Medical Entomology*, (43(2), 309-317)

The Heat is On

Heat is already the leading cause of weather-related deaths in the United States. More than 3,400 deaths between 1999 and 2003 were reported as resulting from exposure to excessive heat.

The number of days in which the temperature exceeds 100°F by late this century, compared to the 1960s and 1970s, is projected to increase strongly across the United States. For example, parts of Texas that recently experienced about 10 to 20 days per year over 100° F are expected to experience more than 100 days per year in which the temperature exceeds 100°F by the end of the century under the higher emissions scenario.

(Source: USGCRP Report, pg. 90)

Who is at Risk?

According to the USGRCP Report, infants, children, pregnant women, elderly, those with chronic medical conditions, outdoor workers, and the impoverished are the most at risk from climate related health effects.

Vulnerable Group	Why They Are Vulnerable
Children	Small ratio of body mass to surface area, increased breathing, extra time spent outside, developing respiratory tracts, and immature immune system
Poor	Lack of proper shelter, air conditioning and other vital resources
Elderly	Likely to have debilitating chronic disease, lack of mobility, high sensitivity to heat, greater risk of heart failure, blood pressure medications can increase chances of dehydration
Diabetes	Fluid imbalance and dehydration make heat waves more dangerous, heart disease combined with diabetes increases chances of mortality during heat waves

(Source: USGCRP Report, pg. 97)

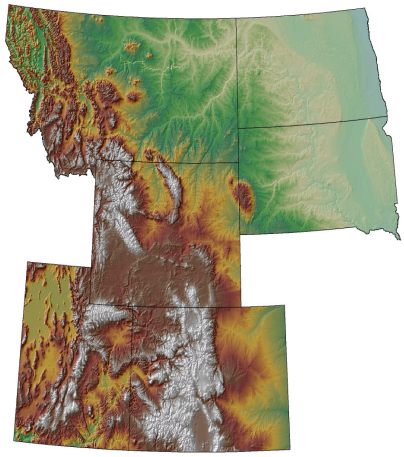
What You Can Do to Decrease Ozone

- Drive less and use public transportation
- Carpool
- Ride your bike
- Make sure that your car is constantly meeting maintenance requirements
- Keep chemicals and cleaning products well-sealed in order to avoid evaporation

(Source: AirNow, http://airnow.gov/index.cfm?action=health2.smog1#1)

Knowledge Building Series:
Climate Change, Human Health and Welfare

EPA Climate Change Information



Regional Climate Change Coordinator

Laura Farris
US EPA Region 8 / MC 8P-SA
1595 Wynkoop Street
Denver, CO 80202-1129
farris.laura@epa.gov
303-312-6388 phone
303-312-6341 fax

Region 8 Climate Change Website
http://www.epa.gov/region8/climatechange/

EPA National Climate Change Website
http://www.epa.gov/climatechange/

For More Information

Intergovernmental Panel on Climate Change
http://www.ipcc.ch/

National Center for Atmospheric Research
http://www.ncar.ucar.edu/research/climate/

Centers for Disease Control and Prevention
http://www.cdc.gov/climatechange/

U.S. Climate Change Science Program
http://www.climatescience.gov/

World Health Organization Global Change
http://www.who.int/globalchange/en/

Adaptation Resources

Extreme Heat
http://www.epa.gov/heatisland/about/heatguidebook.html

Wildfires
http://www.epa.gov/region09/naturalevents/wildfire/

Severe Drought
http://www.epa.gov/naturalevents/drought.html

Flooding
http://www.fema.gov/hazard/flood/index.shtm

"Adaptation to current climate variability can also increase resilience to long-term climate change."

-Intergovernmental Panel on Climate Change

Reference: Global Climate Change Impacts in the United States, Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). Cambridge University Press, 2009.