

Climate Change Impacts on Human Health and Welfare in Western 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 western states will incur steep costs: **increased disease and mortality from heat stress, increased wildfires and attendant air pollution, elimination of stream trout fishing in several states, coastal flooding and disruptions to resource-based economies such as Chinook fisheries.** Water shortages may force “policy to divert supply from agricultural to municipal use.” (ES-10).

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

Urban Heat

“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)

“...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)

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 13)

“Air pollution degraded by wildfire...asthma and COPD aggravated...likely in California (and) the intermountain west.” (Executive Summary, Page 9)

“Wildfires can increase eye and respiratory illnesses due to fire-related air pollution. Climate conditions affect wildfire incidence and severity in the West.” (Chapter 2, Page 7)

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

Fishing

“Warmer water temperatures are projected to eliminate stream trout fishing in 8-10 states and result in a 50% reduction in coldwater stream habitat in another 11-16 states depending on the GCM model used. This could adversely affect up to 25% of U.S. fishing days.” (Chapter 4, Page 31)

“Higher water temperatures and lower stream flows are projected to reduce coldwater trout fisheries as well as native and hatchery stocks of Chinook salmon in the Pacific Northwest.” (Chapter 4, Page 31)

“...estimated magnitude of 50% to 100% reduction in Chinook spawning returns is quite large. Reductions of such magnitude will have a substantial adverse effect on recreational salmon catch rates, and possibly whether recreational fishing would even be allowed to continue in some areas of the Pacific Northwest.” (Chapter 4, Page 31)

Water and Drought

“...water demands for urban populations, agriculture, and power supply are expected to increase, and conflicts over water rights are likely to increase. If total precipitation decreases or becomes more variable, extending the kinds of drought that have affected much of the interior West in recent years, water scarcity will be exacerbated, and increased water withdrawals from wells could affect aquifer levels and pumping costs.” (Chapter 3, Page 26)

“Likely reductions in snowmelt, river flows, and groundwater levels, along with increases in saline intrusion into coastal rivers and groundwater will shrink fresh water supplies even as population growth taxes demand.” (Executive Summary, Page 5)

“...many rapidly growing places in the Mountain West may also experience decreased snow pack during winter and earlier spring melting, leading to lower stream flows, particularly during the high-demand period of summer.” (Chapter 1, Page 14)

“...the Sierra Mountain snow pack could be reduced by 12% to 47% by 2050 ...At the same time, state projections anticipate an additional 20 million Californians by that date.” (Chapter 1, Page 14)

“Projections of increased frequencies of drought combined put the increasing populations of desert southwest cities at risk.” (Chapter 5, Page 5)

Energy

“Warming is virtually certain to increase energy demand... could jeopardize the reliability of service in some regions by exceeding the supply capacity...Higher temperatures also affect costs of living and business operation by increasing costs of climate control in buildings.” (Chapter 3, Page 6)

“Reduced hydropower would mean the need for supplemental electricity sources, resulting in a wide variety of negative ripple effects to the economy and to human welfare.” (Executive Summary, Page 6)

Wildfire

“Studies modeling future wildfire incidence in the Western U.S. ... project increasingly severe wildfires, measured both in terms of energy released and the number of fires that avoid initial containment...In general, these results suggest much of the western U.S. could face an increasing wildfire risk from climate change.” (Chapter 2, Page 17)

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Public Lands

“...natural resources of many western National Parks, National Recreation Areas, and National Monuments resources will be adversely affected by climate change. The most common adverse effects are reductions in some wildlife species, loss of coldwater fishing opportunities and increasing park closures due to wildfire.” (Chapter 3, Page 32)

“The most common adverse effects are reductions in some wildlife species, loss of coldwater fishing opportunities and increasing park closures due to wildfire associated with stressed and dying forest stands.” (Chapter 2, Page 32)

Sea Level Rise/Flooding

*“Given their **location**, the underlying vulnerability of some communities is inherently high just as their adaptive capacity is similarly limited. Populations in gently-sloping coastal areas are particularly vulnerable to sea level rise and settlements along floodplains of large rivers are particularly vulnerable due to projections of increased variability in precipitation.” (Chapter 5, Page 5)*

“Approximately half of the U.S. population, 160 million people, will live in one of 673 coastal counties by 2080. Coastal areas... will be at risk for sea level rise, especially related to severe storms and storm surges.” (Executive Summary, Page 6)

Alaska

“No other region in the U.S. is likely to be as profoundly changed by climate change as Alaska...in this region warming is especially likely to reshape patterns of human settlement.” (Chapter 3, Page 25)

“One recent estimate of the value of Alaska’s public infrastructure at risk from climate change set the value at tens of billions of today’s dollars by 2080.” (Chapter 3, Page 25)

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)

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National and Regional Experts

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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.

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Rick can speak from the perspective of a water quality expert and a surfer. He wrote Surfrider's "State of the Beach" study—which looked at beaches all over the U.S. He's surfed CA beaches for 46 years and watched the water quality problems that have developed with the growing population. Extreme weather events like heavy rains will stress already overtaxed wastewater systems, leading to more raw sewage spilling into the ocean. He can also talk about the coastal erosion problems associated with sea level rise.

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Besides being an expert on fishing and flies, Craig knows the business and how changes in the environment can make a huge impact. Last year, most of Montana's rivers were closed down for fishing during most of the day because of low flows due to sparse winter snow pack and high spring temps—precisely the conditions The CCSP-EPA report predicts to increase due to climate change.

Public Health Professionals/Experts

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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.

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