

“Scientific Assessment of the Effects of Global Change on the United States”
A Report of the White House Committee on Environment and Natural Resources
National Science and Technology Council
May 2008

Excerpts on the Western United States

The report is available online at <http://www.climate-science.gov/Library/scientific-assessment/>.

Temperature

“The warmest years...on record (since the mid-19th century) have mainly occurred in the past 12 years.” (p.52)

“U.S. temperatures also warmed during the 20th and into the 21st century...1998 was the warmest year on record.” (p.53)

“2007 was the 10th warmest year for the contiguous U.S. since national records began in 1895.” (p.53)

“The number of heat waves has been increasing since 1950.” (Executive Summary, p.4)

“The last 10 years have seen fewer severe cold waves than for any other 10-year period in the historical record, which dates back to 1895.” (ES, p.4)

“All of North America is very likely not only to warm during this century ... but to warm more than the global mean warming in most areas.” (p.90)

“Abnormally hot days and nights and heat waves are very likely to become more frequent and cold days and cold nights are very likely to become less frequent over North America.” (ES, p.4)

“The largest warming in the U.S. is projected to occur in winter over parts of northern Alaska.” (p.90)

Precipitation, Runoff and Drought

“Streamflow has decreased by about 2 percent per decade in the central Rocky Mountain region over the past century.” (ES, p.5)

“The annual peak of streamflow in snowmelt-dominated western mountains is now generally occurring a week earlier than in the middle of the 20th century.” (ES, p.5)

“It is likely that droughts will continue to be exacerbated by earlier and possibly lower spring snowmelt runoff in the mountainous West, which results in less water available in late summer.” (p.91)

“Observations over the contiguous U.S. show statistically significant increases in heavy precipitation and very heavy precipitation, primarily during the last three decades of the 20th century.” (p.62)

“Precipitation is likely to be less frequent, but more intense...for example...daily precipitation so heavy that it now occurs only once every 20 years is projected to occur approximately every eight years by the end of this century over much of eastern North America.” (p.94)

Snow and Ice

“Along the Alaskan coast, reductions in the thickness and spatial extent of sea ice are creating more open water, allowing winds to generate stronger waves, which increase shoreline erosion.” (ES, p.6)

“Spring snow cover in mountainous regions of the western U.S. generally decreased during the latter half of the 20th century.” (ES, p.6)

“In Alaska, where the warming has been particularly pronounced, the permafrost base has been thawing at a rate of up to 1.6 inches per year since 1992.” (ES, p.6)

“Glaciers have been losing mass in the northwestern U.S. and Alaska.” (ES, p.6)

“In 2007, Arctic sea ice extent was approximately 23 percent below the previous all-time minimum observed in 2005.” (ES, p.5)

“The average sea ice thickness in the central Arctic very likely decreased by up to approximately three feet from 1987 to 1997.” (ES, p.5)

“The date that rivers and lakes freeze over has become later...and the ice breakup has happened earlier.” (ES, p.6)

“An Arctic Ocean free of summer ice is likely by the end of the century.” (ES, p.6)

Wildlife

“In North America, warming has generally resulted in and is expected to continue to result in shifts of species ranges poleward and to higher altitudes. However, species that require higher-elevation habitat...may have nowhere to migrate.” (ES, p.9)

Human Health

“The IPCC (2007b) projects with virtual certainty ‘declining air quality in cities’ due to ‘warmer and fewer cold days and nights and/or warmer/more frequent hot days and nights over most land areas’...climate change impacts on human health in U.S. cities will be compounded by population growth and an aging population.” (p.178)

“Climate change is likely to increase the risk and geographic spread of vector-borne infectious diseases, including Lyme disease and West Nile virus.” (p.175)

“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.” (p.175)

“Increases in extreme weather...may lead to increases in deaths, injuries, infectious diseases...and stress-related disorders.” (ES, p.15)

Transportation

“Coastal and riverine flooding and landslides are very likely to cause negative impacts on roads, rails and ports.” (ES, p.17)

“Transportation infrastructure will likely be particularly affected in northerly latitudes. Permafrost degradation reduces surface load-bearing capacity and potentially triggers landslides.” (p.195)

Wildfires

“Wildfires pose significant direct health risks...wildfires, with their associated decrements to air quality and pulmonary effects, are likely to increase in frequency, severity, distribution and duration in the Southeast, the Intermountain West and the West.”