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Climate Change Impacts in California

Home / Environment & Public Health / Climate Change
/ *Climate Change Impacts in California*

In 2009 and 2013 the California Natural Resources Agency prepared reports to the Governor on California's Climate Adaptation Strategy, and the Agency also produced three Climate Change Assessments based on peer reviewed science. Those reports detail the existing and expected impacts of global warming in California. These include:

- **Sea level rise, coastal flooding and coastal erosion.** Approximately 85% of California's population live and work in coastal counties. The sea level along California's coasts has risen nearly 8 inches in the past century and is projected to rise by as much as 20 to 55 inches by the end of the century. A 55-inch sea level rise could put nearly half a million people at risk of flooding by 2100, and threaten \$100 billion in property and infrastructure, including roadways, buildings, hazardous waste sites, power plants, and parks and tourist



destinations. Coastal erosion could have a significant impact on California's ocean-dependent economy, which is estimated to be \$46 billion per year.

- As sea levels rise, saltwater contamination of the State's delta and levee systems will increase. Saltwater contamination of the Sacramento/San Joaquin Delta will threaten wildlife and the source of drinking water for 20 million Californians. Farmland in low areas may also be harmed by salt-contaminated water.
- **Losses to the Sierra snowpack and water supply.** The Sierra Nevada snowpack functions as the most important natural reservoir of water in California. Under current conditions, the snowpack is created in fall and winter and slowly releases about 15 million acre-feet of water in the spring and summer, when California needs it most. California's dams and water storage facilities are built to handle the snow melt as it happened in the past. Higher temperatures are now causing the snowpack to melt earlier and all at once. Earlier and larger releases of water could overwhelm California's water storage facilities, creating risk of floods and water shortages.
- **Forestry and higher risk of fires.** Forest and rangelands cover over 80% of California's 100 million acres. Climate change will affect tree survival and growth, reducing these lands' productivity and changing their habitats. In addition, climate change makes forests more vulnerable to fires by increasing temperatures and making forests and brush drier. Today's fire season in the western United States starts earlier, lasts longer, and is more intense than in the last several decades. Wildfire occurrence statewide could increase several fold by the end of the century, increasing fire suppression and emergency response costs and damage to property.
- **Damage to agriculture.** Global warming can cause drought, higher temperatures, saltwater contamination through rising sea levels, flooding, and increased risk of pests. These changes pose a very serious threat to California's agricultural industry, which generated \$39 billion in revenue in 2007, and which

is responsible for more than half of all domestic fruits and vegetables. Because California feeds not only its own residents, but the entire U.S. and other countries as well, production declines could lead to food shortages and higher prices.

- Increased demand for electricity. Higher temperatures and more heat waves will drive up demand for cooling in the summer. As people turn up their air conditioners, increased electricity use will be greatest in southern California and the Central Valley, and may be as high as 60% above present demand by the end of the century.
- **Public health impacts.** Californians already experience the worst air quality in the nation. Hotter temperatures lead to more smog, which can damage lungs, and increases childhood asthma, respiratory and heart disease and death. Certain segments of the population are at greater risk, including the elderly, infants, persons with chronic heart or lung disease, people who can't afford air conditioning, and those who work outdoors. (See Climate Change's Unequal Impacts). As temperatures rise, the number of days of extreme heat events also will rise, causing increases in the risk of injury or death from dehydration, heatstroke, heart attack and respiratory problems. In July 2006, California experienced a heat wave that led to more than 140 deaths, and possibly 2 to 3 times that number. Heat waves similar in length and intensity to those experienced in 2006 will be more frequent and could become annual occurrences by the end of the century.
- **Habitat destruction and loss of ecosystems.** California is one of the most biologically diverse regions of the world, with the highest number of unique plant and animal species of all 50 states and the greatest number of endangered species. Climate change will adversely affect plant and wildlife habitats and the ability of the State's varied ecosystems to support clean water, wildlife, fish, timber and other goods and services important for our well-being.

For a further discussion of the impacts of climate change in California, the state of the research, and state efforts to adapt, see the Office of Environmental Health Hazard Assessment's 2013 Indicators of Climate Change in California report; and the Climate Action Team, Report to the Governor and Legislature (December 2010). Further scientific research reports are available on the California Energy Commission Website.

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