

Social Vulnerability to Climate Change in California

Abstract

The State of California faces a range of impacts from global climate change, including increases in extreme heat, wildfires, coastal flooding, and erosion. Changes are also likely to occur in air quality, water availability, and the spread of infectious diseases. To date, a great deal of research has been done to forecast the physical effects of climate change, while less attention has been given to the factors that make different populations more or less vulnerable to harm from such changes. While disaster events may not discriminate, impacts on human populations are shaped by intervening conditions that determine the human impact of the event and the specific needs for preparedness, response, and recovery.

In this study, the authors analyzed the potential impacts of climate change by using recent downscaled climate model outputs to create a variety of statistics and visualizations that show their distribution across the state. To understand how the population exposed to these impacts will be affected, social vulnerability – defined as the susceptibility of a given population to harm from exposure to a hazard, directly affecting its ability to prepare for, respond to, and recover, must be evaluated.

The researchers developed a new climate vulnerability index to indicate the social vulnerability of a region's population to climate-related harm. The index combines 19 indicators into one overall climate vulnerability score and includes factors specifically related to climate impacts, such as air conditioner ownership, childhood obesity, percentage of tree cover, pre-term births, workers in outdoor occupations, and others.

The authors present a series of maps showing where social vulnerability to climate change is greatest, and where it intersects with the most severe projected climate change impacts. The most significant risk from climate change occurs where there are large groups of people exposed to a climate-related hazard and where there is high social vulnerability. Understanding vulnerability factors and the populations that exhibit these factors are critical for crafting effective climate change policies and response strategies. They are also important to the emerging study of climate justice, which is the concept that no group of people should disproportionately bear the burden of climate impacts or the costs of mitigation and adaptation.

Keywords: climate change, social vulnerability, economic vulnerability, social vulnerability, California, sea level rise, wildfire, extreme heat, air quality, water, energy, electricity, Agriculture

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