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Pacific Institute Maps Social Vulnerability to Climate Change in California

New Study Identifies Communities Facing Increased Risks and the Need for Adaptation Planning

August 13, 2012, Oakland, Calif.: New research shows that addressing social vulnerability – the susceptibility of a given community to harm from a hazard – in climate change policies and response strategies is critical to California’s future. With some degree of climate change unavoidable, communities must begin developing and implementing adaptation plans, and integrating social vulnerability into their strategies is key.

The state of California faces a range of impacts from global climate change, including increases in extreme heat, wildfires, and coastal flooding and erosion. Changes are also likely to occur in air quality, water availability, and the spread of infectious diseases. Social and economic factors – like age, race, income, lack of access to a vehicle or other means of transportation – directly affect a community’s ability to prepare for, respond to, and recover from climate impacts.

The Pacific Institute report [*Social Vulnerability to Climate Change in California*](#) identifies geographic areas within the state with heightened risk to projected climate impacts. The research – carried out with input from community leaders and advocates of the Oakland Climate Action Coalition and with representatives from federal, state, and regional agencies and community organizations – highlights why understanding vulnerability factors and the populations that exhibit these factors is critical for crafting effective climate change policies and response strategies.

“Climate risk is a function of exposure and vulnerability,” said Heather Cooley, co-director of the Pacific Institute Water Program and lead author of the report. “Many social and economic factors interact – such as access to transportation, legal residency, income, and language abilities – and it is these factors that determine vulnerability to a climate impact or other hazard.”

In the new report, maps show where social vulnerability to climate change in California is greatest, and, most significant for planning purposes, where social vulnerability intersects with the most severe projected climate change impacts. For example, the number of extreme heat days is projected to at least double and in some areas increase by 500% by the end of the century. But while warmer temperatures will affect all Californians, it will be especially problematic for those with heightened vulnerabilities, many of whom are concentrated in Los Angeles, Orange, San Diego, and San Bernardino counties.

Sea-level-rise-induced coastal flooding is largely centered on the San Francisco Bay Area and the Los Angeles region, especially Orange County. Social vulnerability, however, is generally



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low in the Los Angeles region, with the exception of Ventura County, where more than half of those impacted exhibit a high social vulnerability. The San Francisco Bay Area, however, has large numbers of highly vulnerable populations, with more than half of the population at risk of inundation in Contra Costa, San Francisco, and Monterey Counties scoring in the top 30% for social vulnerability.

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. To compare overall social vulnerability to climate change across the state, the Pacific Institute developed a new “climate vulnerability index” that combines data from 19 different social and economic factors – such as air conditioner ownership, percentage of tree cover, workers in outdoor occupations, and more – for each of the 7,049 census tracts in the state. Areas were ranked as high, medium, and low vulnerability based on their index scores.

The vulnerability index was then overlaid with maps of projected exposure to extreme heat, particulate matter, coastal flooding, and wildfire to identify areas with high social vulnerability and high projected exposure to climate change disturbances. The areas of overlap indicate those areas with heightened risk of being impacted by these climate changes as a result of exposure and social vulnerability.

“Understanding vulnerability factors and the populations that exhibit these factors is critical for crafting effective climate change adaptation policies and response strategies. To achieve climate justice, no group of people should disproportionately bear the burden of climate impacts or the costs of mitigation and adaptation,” said Eli Moore, report author and co-director of the Pacific Institute Community Strategies for Sustainability and Justice Program. “For example, a vulnerability analysis that highlights geographic areas where targeted assistance is needed can be used to guide discussions about how to distribute climate adaptation funds.”

To address the vulnerabilities identified in the study, communities need to begin developing and implementing adaptation plans, and these local planning processes need to involve communities most vulnerable to harm when developing appropriate preparation and adaptation strategies. Local governments or regional planning agencies should conduct detailed studies to better understand the potential impacts of climate change on their communities, including an evaluation of social vulnerability.

The [Social Vulnerability to Climate Change in California](http://www.pacinst.org/reports/climate_vulnerability_ca/index.htm) report can be downloaded free of charge from the Pacific Institute website at:

http://www.pacinst.org/reports/climate_vulnerability_ca/index.htm.

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