

A SCREENING TOOL FOR CLIMATE CHANGE POPULATION VULNERABILITY ASSESSMENTS

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Background and Aims: Conducting vulnerability assessments is one of the key tools for adaptation for climate change. Population vulnerability screening is needed to guide policy makers in planning efforts to address climate change impacts. California has proceeded in implementing cap and trade as a regulatory method to mitigate greenhouse gas (GHG) emissions. Decision-makers need to determine whether there are ways to target GHG mitigation schemes in ways that maximize community-level health benefits from co-pollutant reductions and minimize the likelihood that market-based approaches produce or exacerbate disparities in health benefits.

Methods: We utilized an existing environmental justice screening method and targeted it for two areas in California which are likely to experience climate change impacts, Fresno and Los Angeles counties. This method maps cumulative impacts and vulnerability to air pollution and models the locations of pollutant sources as well as vulnerable populations. We further adapted this method with metrics that are associated with adaptation capacity such as population sensitivities (e.g., elderly living alone and senior housing), air conditioning ownership, green space, co-morbidities, and flood and wildfire risk.

Results: A cumulative climate change vulnerability score was computed for each census tract for the two counties. A separate score for the climate change vulnerability and environmental justice layers, and a combined score, was computed. The predictive power of the scores was validated by examining the sensitivity to emergency room and hospitalization data for heat-related illness.

Conclusions: We developed a geospatial mapping resource that identifies climate change vulnerable populations in two major metropolitan areas of California. This tool can be used by multiple stakeholders to identify locations of high cumulative exposures to environmental hazards and social vulnerability that may require targeted efforts to promote adaptation to climate change impacts, and increase the likelihood that mitigation strategies will yield maximum decreases in localized co-pollutants.