# Social vulnerability to climate disasters: if we can't model it well, can we at least model it usefully?

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It can be hard to bridge the gap between users' expectations of socioeconomic datasets and what we can honestly provide. Ask a climate modeler or demographer for a global map of community vulnerability to natural disasters over the next century, and they will look at you in fear. But communities and funders have to make adaptation decisions somehow, and we think that a careful, accessible, uncertain dataset is better than nothing, and helps avoid projects that only consider data-rich regions or that use questionable proxies.

Here we do not present an accurate, global dataset of community vulnerability. Instead, we work with local and regional decision-makers to try to maximize the usefulness of less accurate, first-guess data.

We create a new global gridded dataset of vulnerability distributions projected to 2100. We use simple assumptions about within-community wealth distributions and calculate between-community differences from regionally-aggregated datasets, recent machine-learning wealth maps, and SSP scenarios.

This dataset is designed to be used in climate adaptation decisions: by representing vulnerability as varying within and between communities, decision-makers can compare climate adaptation measures for particular neighborhoods and socioeconomic groups. The model is agnostic about exactly who the vulnerable groups are in any location, assuming that on-the-ground decision-makers know these details better than any model estimate. By including uncertainty, the model can also be clear about when its evaluations are robust, and when local context probably matters more than its results.

Our work is powered by the CLIMADA (CLIMate ADAptation) climate risk and adaptation model, an open-source tool and database designed for cost-benefit analyses of climate adaptation interventions. In particular, CLIMADA provides probabilistic data on tropical storm, flood and extreme heat hazards.

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