



# Research Brief

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## Levee accreditation and its links to insurance costs in California

Millions of Californians live behind levees, yet federal maps often treat non-accredited levees as absent. Stanford research links this legacy “without levee” mapping to higher flood insurance prices for some communities.

### Background

Historically, flooding has been the most costly natural disaster in the United States and one of the most frequent natural disasters experienced in California. Thousands of levees have been built nationwide to protect people from flooding, most of them maintained by local authorities. In California alone, millions live behind levees. Flood insurance, a key tool for managing financial risk and recovery, depends on these levees to reduce risk.

The price of flood insurance for consumers has historically been set using a Federal Emergency Management Agency (FEMA) assessment that categorizes levees as either “accredited” or “non-accredited”. Accreditation requires the levee owner — usually a local government — to fund and provide engineering documentation showing that a levee meets federal design standards. Importantly, accreditation is a mapping and insurance designation, not a public safety guarantee. Accredited levees can fail, and non-accredited levees may provide meaningful protection. But for many levees, there is little publicly available information on their condition or maintenance.

In the 2000s, non-accredited levees were mapped using a “without levee” procedure, effectively treating them as if they did not exist. FEMA revised the “without levee” procedure in 2013, but California’s mapping was largely complete by that time. As a result, unlike many other states that were mapped later under the new approach, about 90% of California still relies on flood maps produced before that update.

### POINTS FOR POLICYMAKERS

- **Non-accredited levees are far more common.** Non-accredited levees outnumber accredited by about 10 to 1. Accredited systems are concentrated in urban areas and protect a larger share of people and assets, while non-accredited levees are located mostly in rural, less populated areas.

- **Levee accreditation status has created inequitable insurance price differences.** Between 2009 and 2020 (pre Risk Rating 2.0) households behind non-accredited levees paid roughly twice as much in premiums as they would have if their levee had been accredited. This essentially created an insurance cross-subsidy from relatively lower-income rural areas to higher-income urban centers.

- **These burdens are especially acute in the San Joaquin Valley,** where high insurance costs intersect with low Community Rating System discounts and high poverty rates. This highlights how levee mapping choices can compound inequities across regions and communities.

- **Risk Rating 2.0 pricing is narrowing premium differences, but does not redraw the preexisting flood maps.** Accreditation still shapes the 100-year flood zone designation that underpins the National Flood Insurance Program, with enduring economic impacts to households through property prices, insurance mandates and higher building codes.



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FEMA plays a crucial role in flood resilience and response as the administrator of the National Flood Insurance Program (NFIP) and the producer of the Flood Insurance Rate Maps, which underpin the flood insurance program. FEMA and the NFIP have been widely criticized for underestimating flood risk, in large part because FEMA's flood maps and insurance pricing have not accounted for true flood risk. In contrast, a new study led by Stanford scholars finds that FEMA flood maps can also overestimate flood risk, particularly in communities protected by non-accredited levees. The research shows that this legacy mapping and accreditation framework has had major consequences for who pays for flood insurance, and how much.



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## ABOUT THE RESEARCH

This brief is based on **Drawing the line: how levee accreditation shapes flood insurance winners and losers** published in *Environmental Research Letters*.

## ABOUT THE AUTHORS



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