

Flood Risk & Social Vulnerability in Two CA Counties

What is social vulnerability?

Social vulnerability captures how well people can **prepare for, withstand, and recover from** hazards. Two tract-level indicators I map here are:

- **Poverty (≤200% of the federal poverty level)** Alameda County (ACS C17002)
- Severe rent burden ($\geq 50\%$ of income on rent) Riverside County (ACS B25070)
- These do not cause floods, but they signal limited financial slack when floods occur (insurance, evacuation, repairs, temporary housing).

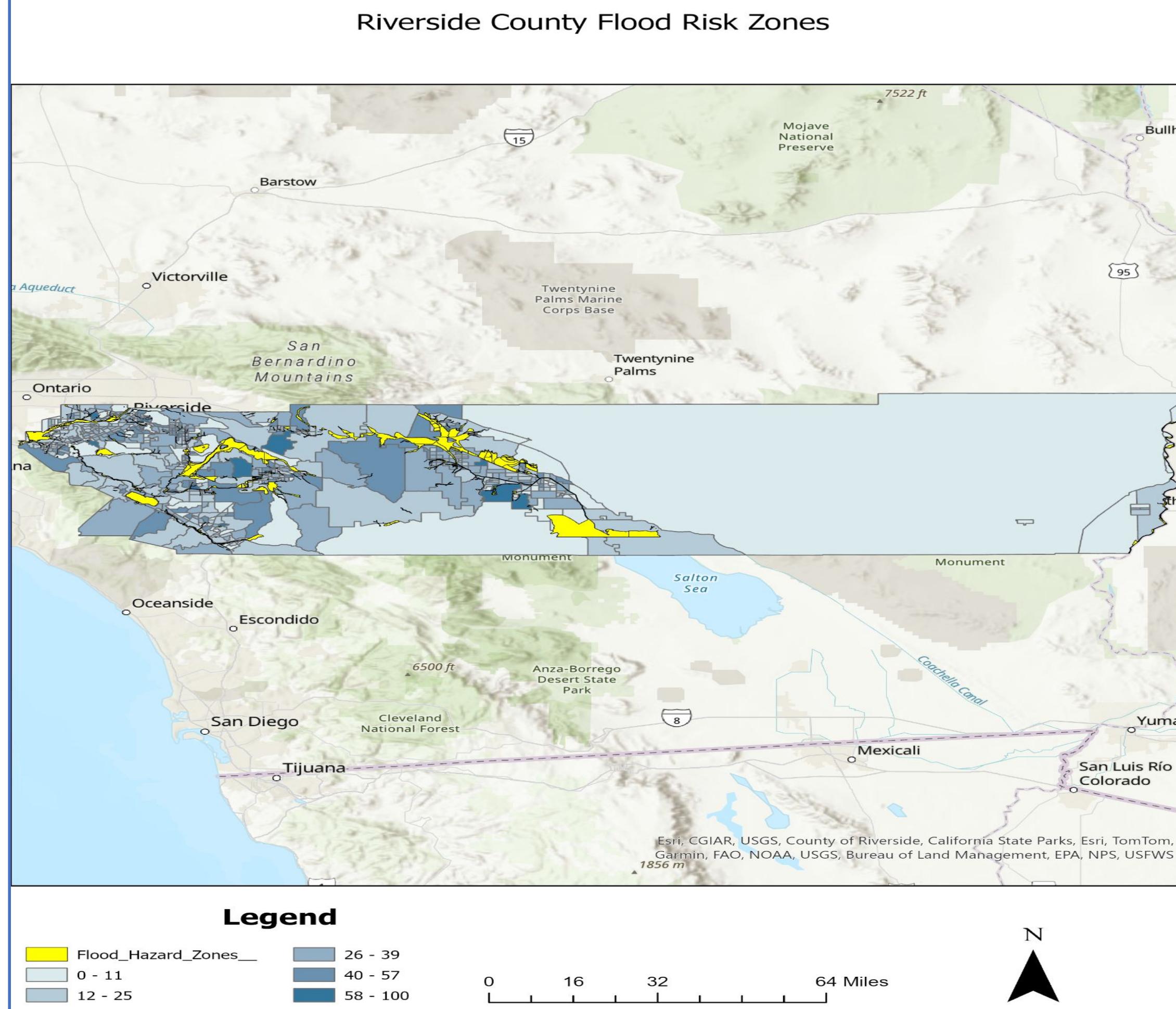
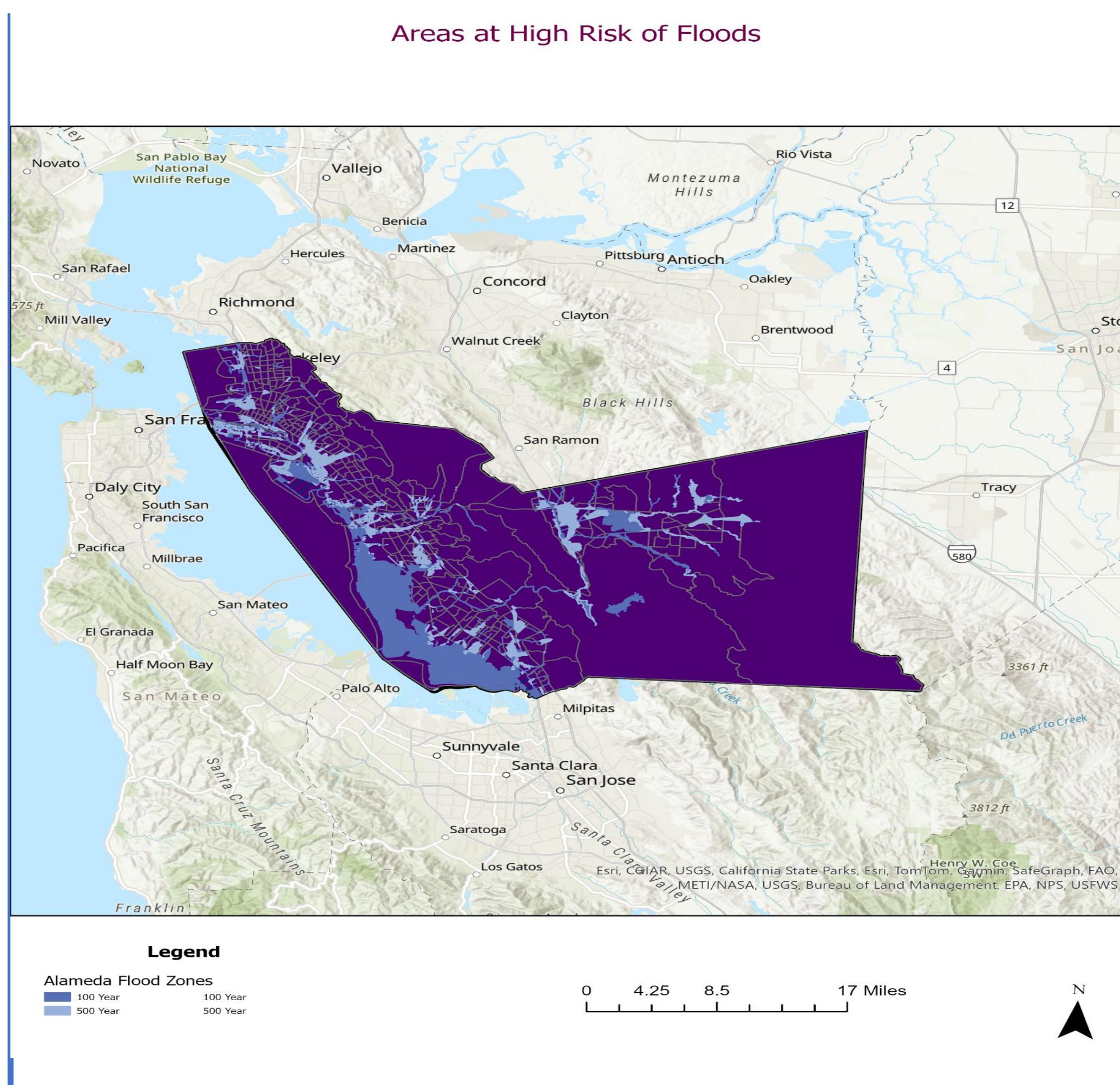
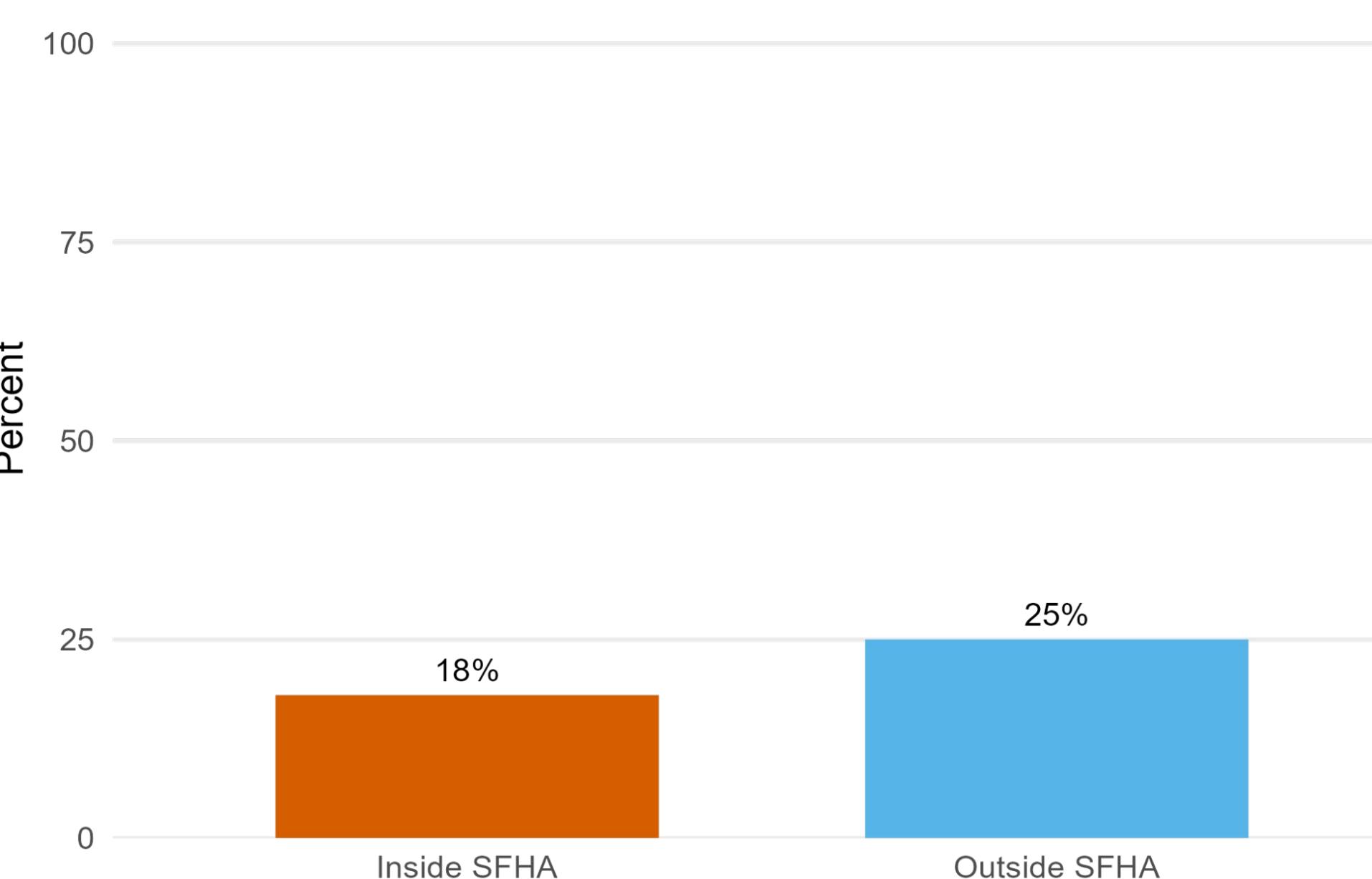
Why this project?

Where I'm from (Karachi), flooding consistently hits lower-income neighborhoods hardest. I wanted to see how that vulnerability looks in California.

Research question:

Are communities facing poverty or severe rent burden more likely to be located in FEMA flood zones and what does that imply for evacuation, insurance, and recovery planning??

Alameda County: % Population <200% FPL



Results, Discussion, and Conclusions:

Key Findings:

Alameda (Poverty):

- Outside SFHA: 25% below 200% FPL
- Inside SFHA: 18% below 200% FPL
- In **Alameda**, higher poverty rates are **not** concentrated inside FEMA flood zones. Vulnerability may be driven more by housing costs and displacement risk near, but not necessarily inside, mapped floodplains.

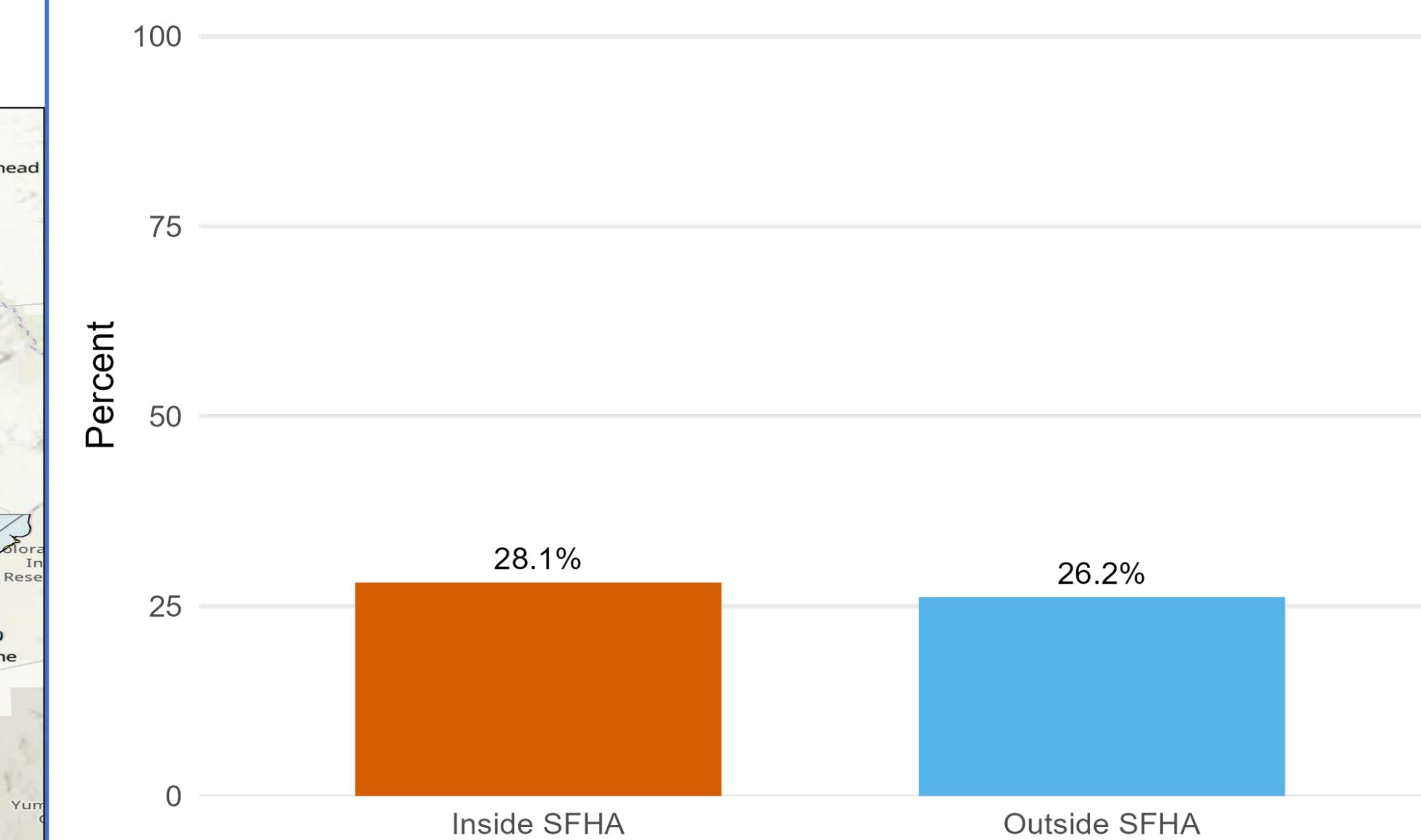
Riverside Renters Burden:

- Outside SFHA: 26.2%
- Inside SFHA: 28.1%
- In **Riverside**, renters **inside** SFHAs show a modestly higher severe rent burden, suggesting limited financial slack for evacuation, repairs, or temporary housing after a flood.
- **Actionable geography.** The maps identify neighborhoods to prioritize for preparedness, shelter siting, and outreach.

Challenges & data limits:

- ACS estimates have **margins of error**; tract-level rates can be noisy.
- SFHA is a regulatory flood layer; it may miss local or future risk.

Riverside County: % Renters Paying $\geq 50\%$ of Income



Conclusion:

Income and rent burden help locate **who** is least able to cope with a flood, not just **where** water may go.