

# A SCREENING TOOL FOR CLIMATE CHANGE POPULATION VULNERABILITY ASSESSMENTS



CALIFORNIA  
ENVIRONMENTAL  
HEALTH TRACKING  
PROGRAM

Funded by the U.S.  
Association of State and  
Territorial Health Officials

# Authors

---

**Paul English**

**Max Richardson**

**California Department of Public Health**

**Rachel Morello-Frosch, University of California, Berkeley**

**Manuel Pastor, University of Southern California**

**Jim Sadd, Occidental College**

**Michael Jerrett, University of California, Berkeley**

**Bill Jesdale, University of California, Berkeley**

# Presenter Disclosures

---

**Paul English**

- (1) The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose

# What is Climate Change Population Vulnerability Screening?

---

Determination of demographics or geographic locations of populations at highest risk for climate change threats (e.g. heat, flooding, sea level rise, wildfires, etc.)

Why needed?

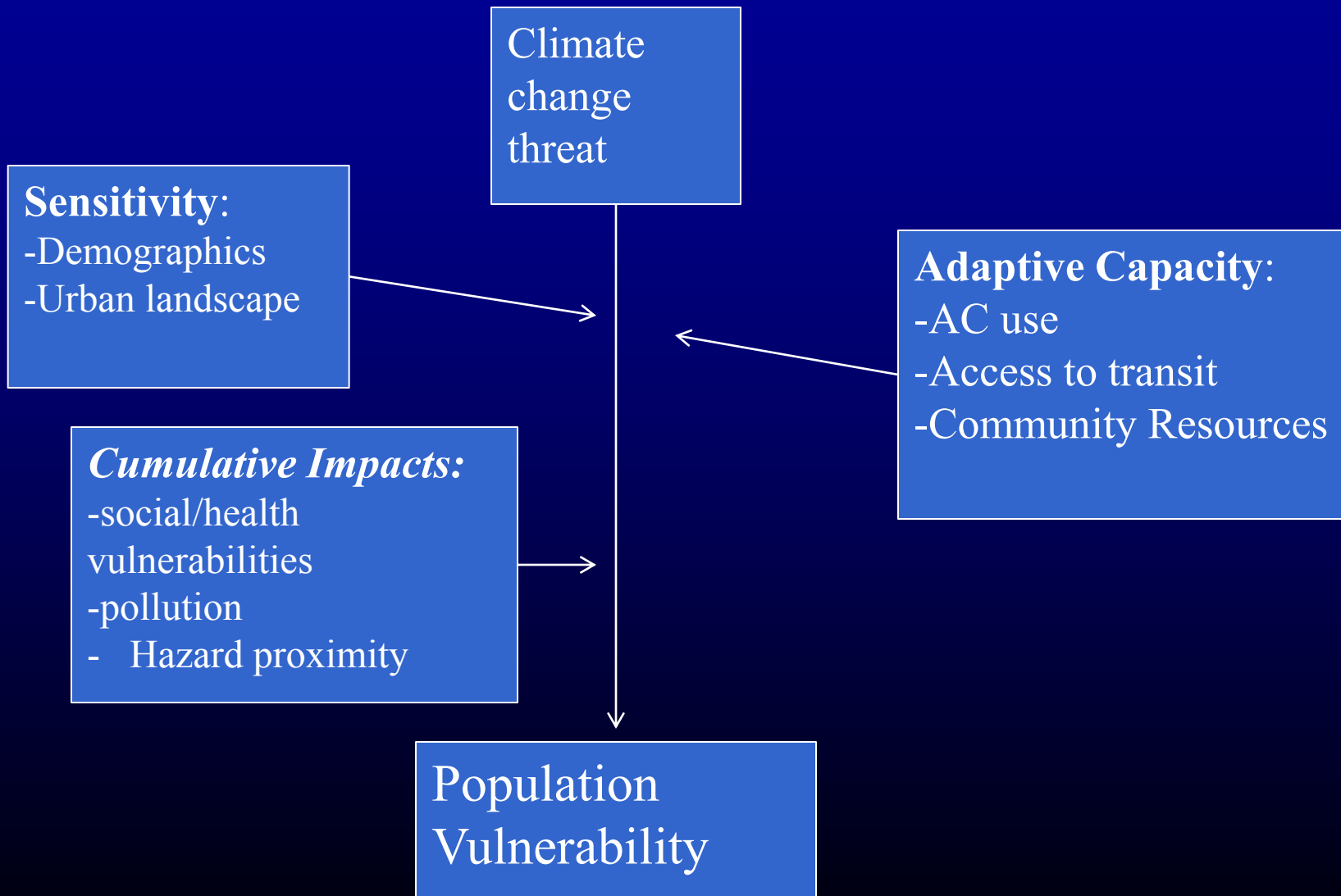
- To develop public health adaptation strategies for local communities
- To target specific mitigation activities (e.g. tree cover) in targeted areas

# Some Previous Efforts

---

- Reid et al: U.S. Map of Heat Vulnerability (census tracts)
- Cheng/Newbold: Hamilton, Ontario (focused on low-income immigrants and elderly living alone)
- Houghton/Luber: Austin, TX (local vulnerability factors)
- Samson et al. Global vulnerability maps

# Population Vulnerability Model



## Study Areas

Hot, agricultural,  
heavily Hispanic

San Francisco

Fresno County

Los Angeles County

Pacific Ocean

Varied climate,  
multicultural,  
multiple CC risks

Los Angeles



# Methods

---

- Start with Sadd, et al\* method mapping cumulative impacts and social vulnerability (23 indicators) at census tract level:
  - 3 components:
    - hazard proximity and land use
    - air pollution exposure and health risk
    - social and health vulnerabilities

\*Sadd et al., Int J Environ Res Public Health. 2011 May;8(5):1441-59



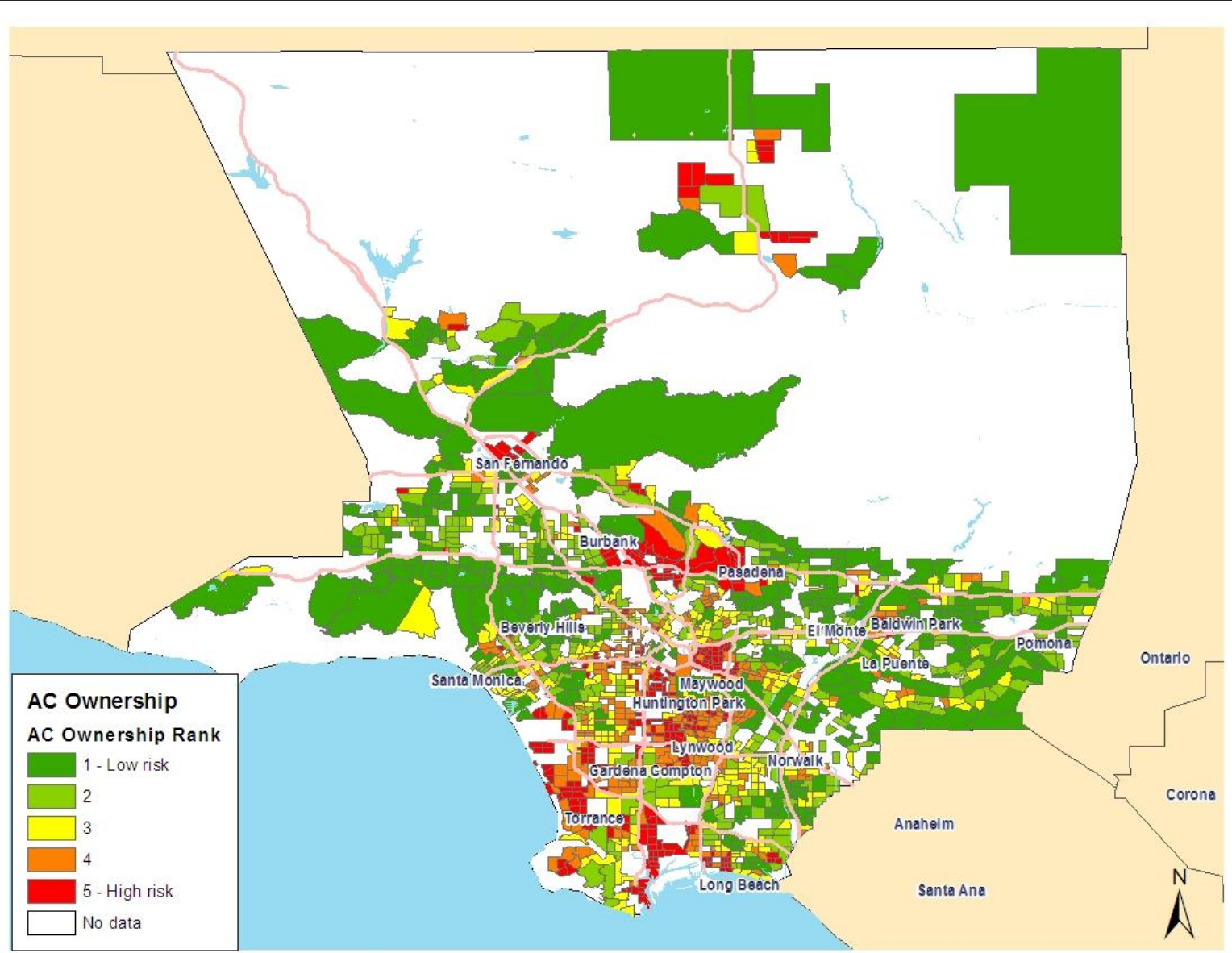
# Methods (cont)

---

- Develop additional climate change vulnerability layer based on:
  - Central air conditioning ownership
  - Land cover (tree canopy and impervious surfaces)
  - Transit (car ownership and public transit access)
  - Wildfire risk
  - Flood risk
  - Elderly living alone
- Data were ranked by quintiles and mapped at census tract level

# LA County Climate Change Vulnerability

RANK: Proportion of households with central AC



# Fresno County Climate Change Vulnerability

## Proportion of households with central AC

