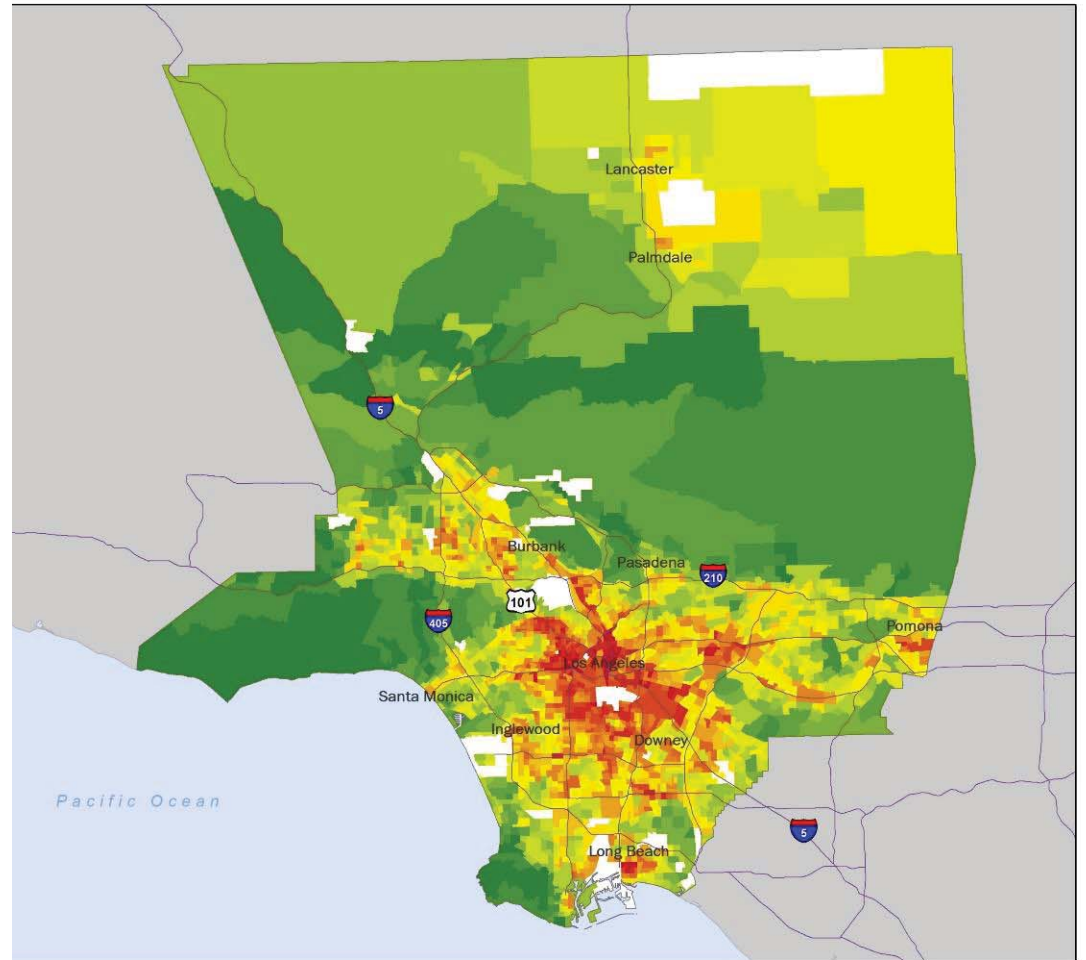# EJSM OVERVIEW

- Maps where people live

- Measures the "cumulative impact" using a variety of indicators

- Mapping done at the census tract level

- Scoring system: each tract receives "scores" related to quintile distribution of indicators

CATEGORIES OF CUMULATIVE IMPACT

Proximity to hazards & sensitive land uses

- Point and area emissions sources and hazards
- Land uses associated with sensitive populations (CARB, 2005)

Health risk & exposure

- State and national data sources; single and multiple pollutants
- Examples: PM and Ozone concentrations; cancer risk from air toxics - calculated from multiple emissions sources

Social & health vulnerability

- From epidemiological research on social determinants of health
- American Community Survey/US Census Data
- State and municipal data sources

Climate change vulnerability

- Based on climate change and health literature
- Heat islands, temperature trends, vulnerability/resilience
-
-

CATEGORY 1: SENSITIVE LAND USES DATA INPUTS

Sensitive land uses as defined by CARB:

(Air Quality and Land Use Handbook, 2005)

- Childcare facilities
- Healthcare & senior housing facilities
- Schools
- Urban Playgrounds & Parks
- Residential land use

Polygons receive a score of 1 if they contain at least one sensitive land use category

CALCULATING HAZARD PROXIMITY

Why the census tract level?
- Consistent level of geography for many sources of data
- All remaining health risk, social vulnerability, and climate impact measures at tract level

Why score 1-5?
- Expresses patterns well and is simple to explain
- There is no "right" distribution
    - Magnitudes of actual hazards are unknown
    - More statistically complex methods yield similar results
    - Other distributions could easily be applied

CATEGORY 2: HEALTH RISKS & EXPOSURE DATA UPDATES

RSEI (Risk Screening Environmental Indicators)

- (2016) average toxic conc. hazard scores

PM$_{2.5}$ Average Annual Concentration (2017)

- interpolated from CARB statewide air monitor network
- Same as used in CalEnviroScreen v.3

Ozone Concentration (2017)

- portion of daily max 8-hour concentration that exceeds CA standard of 0.070 ppm
- Same as used in CalEnviroScreen v.3

NATA Respiratory Hazard - mobile & stationary sources

- 2011 (National Air Toxics Assessment)
- Calculated from modeled air toxics concentrations

NATA Estimated Inhalation Cancer Risk (NATA 2011)

- Includes diesel (not recognized by US EPA)

Pesticide applications (lbs/m²) – (2017) from CA DPR; same used in CalEnviroScreen

CATEGORY 3: SOCIAL & HEALTH VULNERABILITY DATA

Census Tract Level Metrics (ACS 2012-16)

Biological Vulnerability (individual)
- Age of residents (% <5)
- Age of residents (% >60)
- Birth outcomes – % preterm or SGA infants 2001-06

Socioeconomic Vulnerability (community)
- % residents of color
- % residents below twice national poverty level
- Home ownership - % living in rented households
- Housing value – median housing value
- Educational attainment – % population > age 24 with less than high school education

Civic Engagement Capacity
- Linguistic isolation - % pop. >age 4 in households where no one >age 15 speaks English well
- Voter turnout - % votes cast among all registered voters averaged for 2012-16 general elections

CATEGORY 4: CLIMATE CHANGE VULNERABILITY DATA

Heat Island Risk
[Statewide scoring]

- % tree canopy
- % impervious surface
  - USGS National Land Cover Dataset, 2012

Temperature
[Statewide scoring]

- Projected max monthly temperature (2050-2059)
- Change in projected max monthly temperature
  - (2050-2059) – (2000-2009)
- **Change in degree-days of warm nights (19°C)**
  - (2050-2059) – (2000-2009)
  - National Center for Atmospheric Research, downscaled Community Climate System Model, scenario B1, ensemble average & Cal ADAPT

Mobility and social isolation
[Regional scoring]

- % elderly living alone
- % car ownership
  - American Community Survey Summary Data (ACS) 2008-2012

CUMULATIVE IMPACT SCORE

Total Cumulative Impact Scores at the Tract Level:

Sum the four impact and vulnerability scores =

> Hazard Proximity and Sensitive Land Use (1-5) +
>
> Health Risk and Exposure (1-5) +
>
> Social and Health Vulnerability (1-5) +
>
> Climate Change Vulnerability (1-5)

➢ *Final Cumulative Impact Score ranges from 3-15 or from 4-20 with climate vulnerability*