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Exploring Alternate Definitions of Environmental Justice for SCAQMD's 2016 Socioeconomic Report

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SCAQMD EJ Definition

- An area with:
  - At least 10% of the population below the federal poverty line and
  - An annual mean $PM_{2.5}$ concentration > 11.1 µg/m^3 per year or a toxic cancer risk > 894 in a million (Top 15th percentile $PM_{2.5}$ and toxic cancer risk values; updated over time)
- Currently used for grant distribution purposes
- We have created an alternative set of definitions for use in sensitivity analysis within 2016 Socioeconomic Review

Considerations

- An alternative definition of EJ:

    - Should be "fit for purpose" – i.e. should identify and characterize disadvantaged communities to best aid SCAQMD in analyzing differential impacts of proposed AQMP;

    - Should prioritize SCAQMD-generated data when possible;

    - Must include air quality measures;

    - Should include relevant socioeconomic and sociodemographic data; and

    - May consider race and ethnicity and other non-air quality environmental indicators.

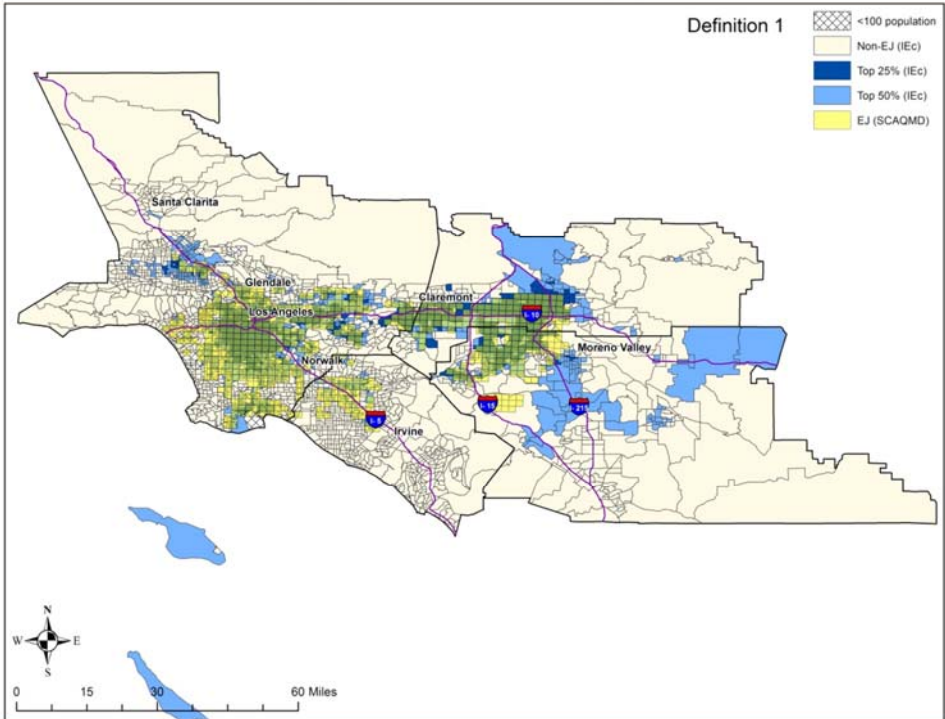## CalEnviroScreen2.0 Method for SCAQMD

- For each indicator, we use raw data from CalEnviroScreen (CES) for each SCAB census tract to assign a percentile ranking based on the mean value, relative to SCAB.

- SCAQMD cancer risk estimates supplement CES data.

- We assign half-weights to environmental indicators of potential hazard.

- Environmental burden indicators and demographic indicators are averaged separately and given a 1-10 score, then multiplied together for an overall percentile in SCAB.

- We limit our EJ assignments to either the top 25% or top 50% of census tracts.
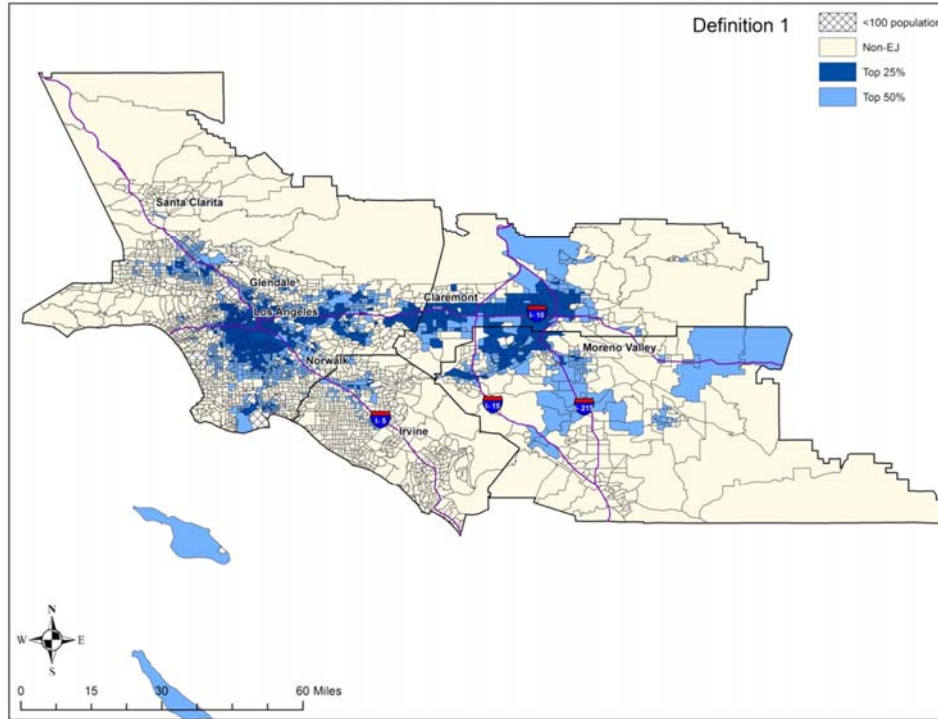
Recommended Alternative EJ Definitions

ALTERNATIVE DEFINITION	DEMOGRAPHIC INDICATORS		ENVIRONMENTAL INDICATORS	
	Income	Other Sociodemographic	Air Quality	Other Environmental Burdens
1	Poverty status		$PM_{2.5}$, toxic cancer risk, ozone	
2	Poverty status	Age, asthma, education, linguistic isolation, low birth weight, unemployment	$PM_{2.5}$, toxic cancer risk, ozone	
2a	Definition 2, plus race and ethnicity			
3	Poverty status	Age, asthma, education, linguistic isolation, low birth weight, unemployment	$PM_{2.5}$, toxic cancer risk, ozone	Drinking water, pesticides, toxic releases, traffic, *cleanup sites, groundwater threats, hazardous waste, impaired water bodies, solid waste**
3a	Definition 3, plus race and ethnicity			

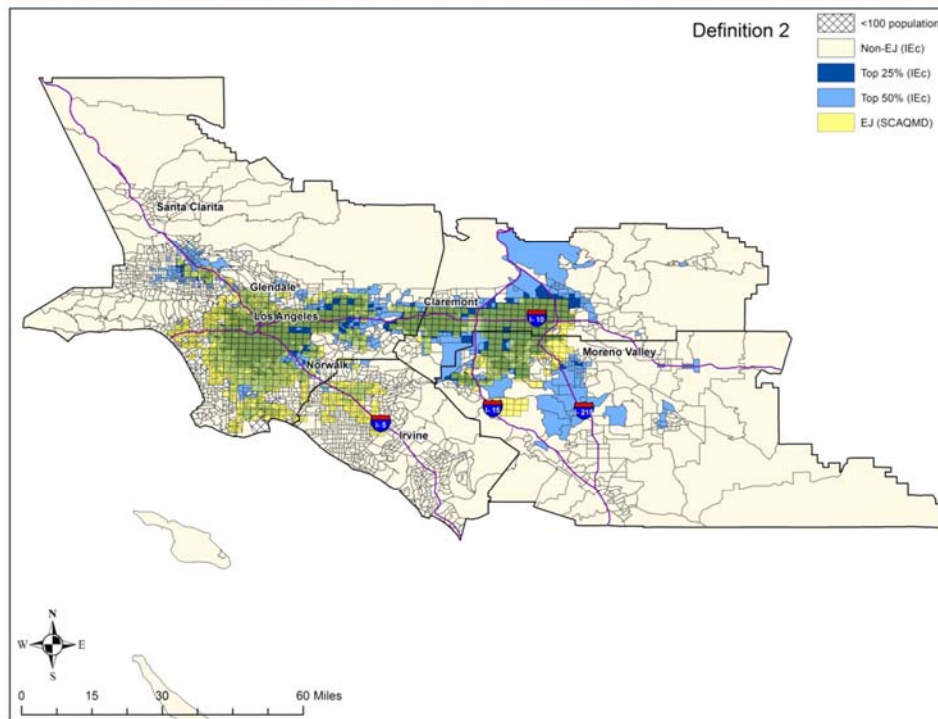*Indicators in italics are given half-weight in the analysis

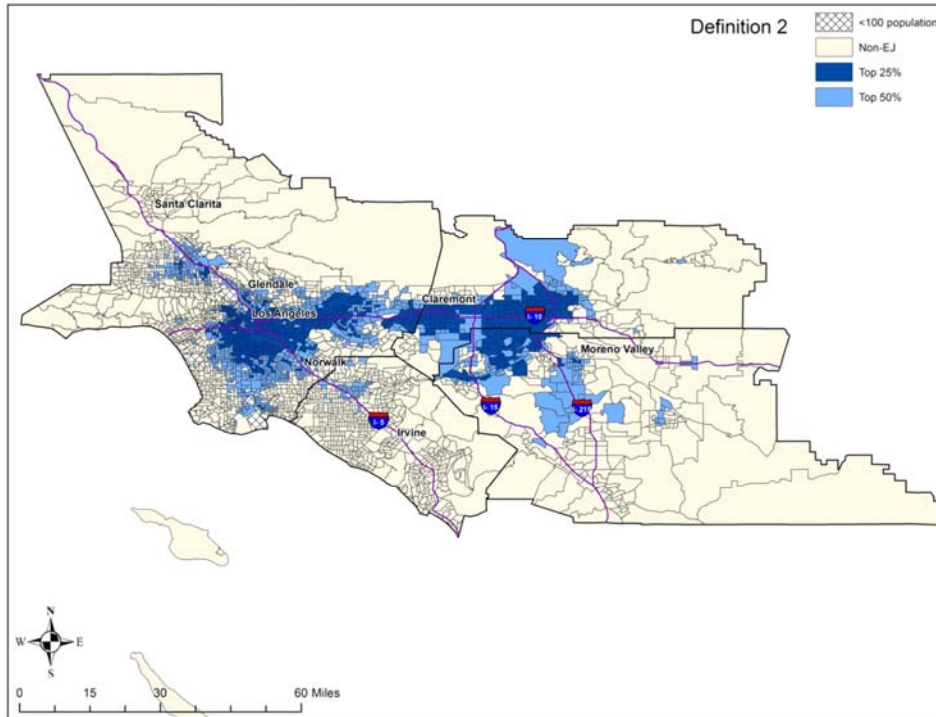# Alternative Definition 1: Income, Air Quality

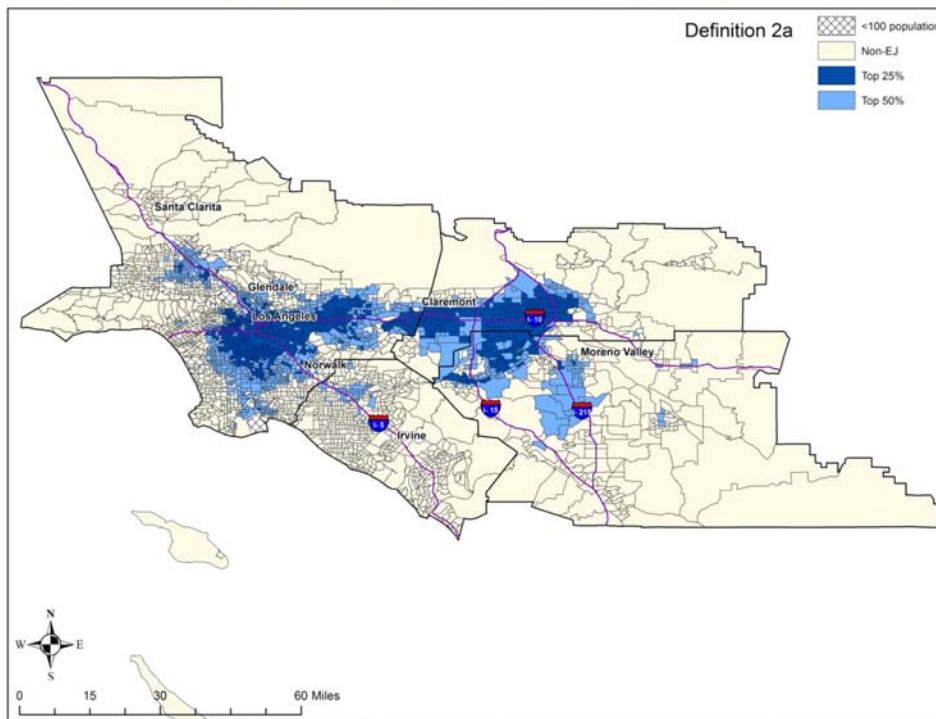# Alternative Definition 1: Income, Air Quality

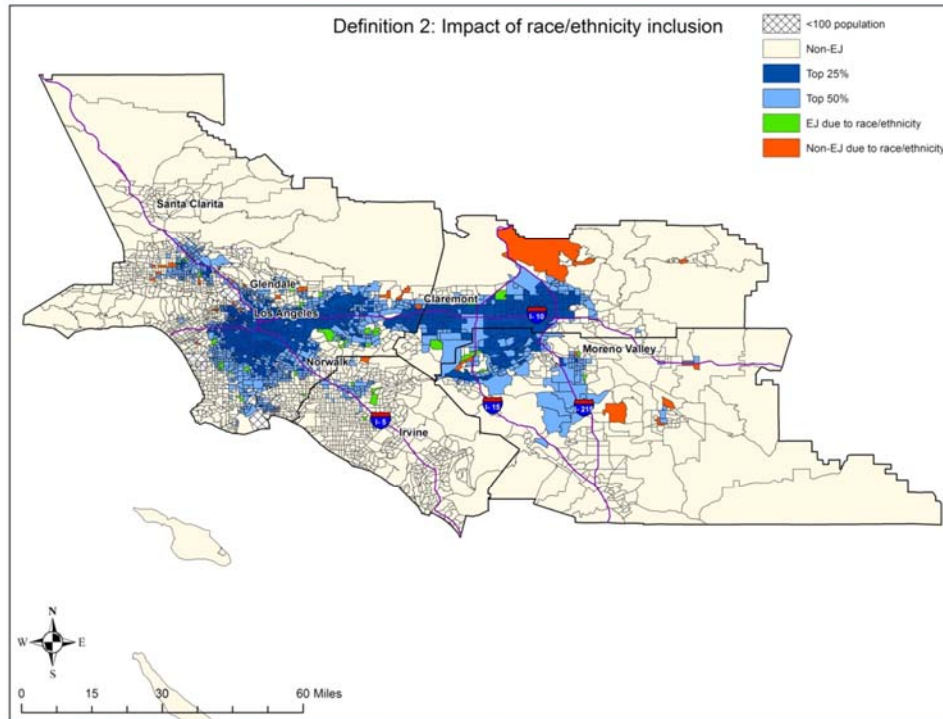# Alternative Definition 2: Income, Air Quality, Sociodemographics

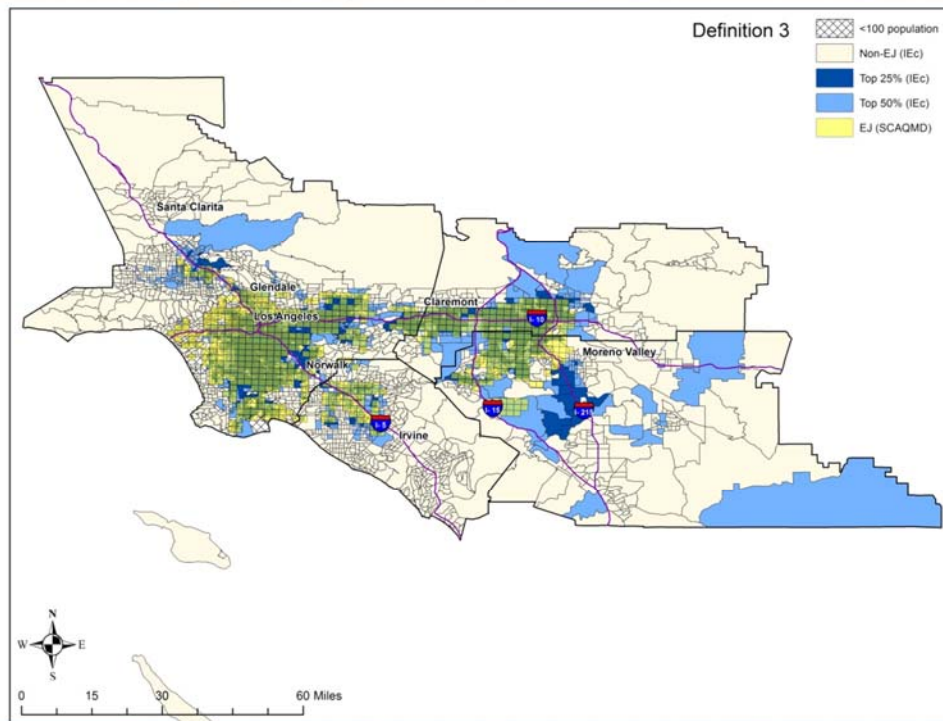# Alternative Definition 2: Income, Air Quality, Sociodemographics

Alternative Definition 2A: Income, Air Quality, Sociodemographics, Race/Ethnicity

Comparison of Definitions 2 and 2A

Definition 2: Impact of race/ethnicity inclusion

Legend:
- <100 population
- Non-EJ
- Top 25%
- Top 50%
- EJ due to race/ethnicity
- Non-EJ due to race/ethnicity

Alternative Definition 3: Income, Air Quality, Sociodemographics, Environmental Burden

Definition 3

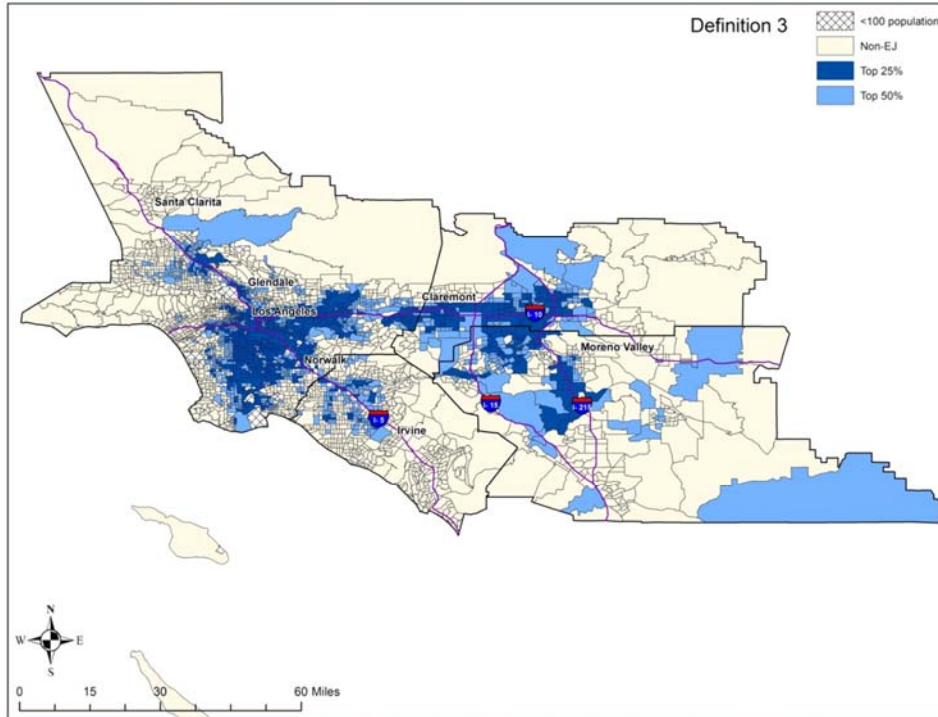Legend:
- <100 population
- Non-EJ (IEc)
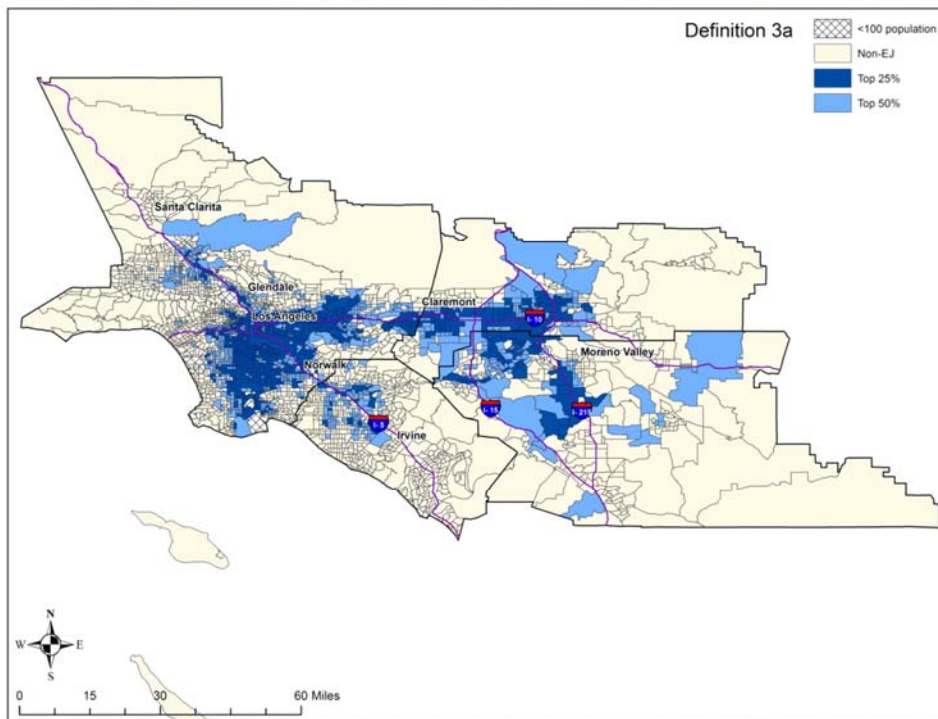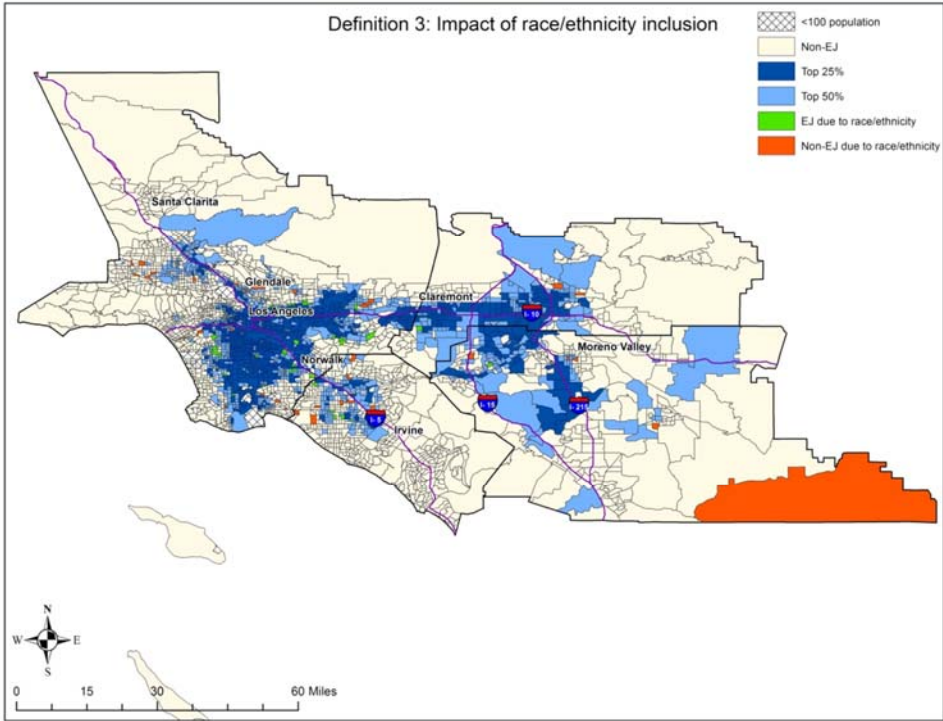- Top 25% (IEc)
- Top 50% (IEc)
- EJ (SCAQMD)

Alternative Definition 3: Income, Air Quality, Sociodemographics, Environmental Burden

Alternative Definition 3A: Income, Air Quality, Sociodemographics, Environmental Burden, Race/Ethnicity

Comparison of Definitions 3 and 3A

Definition 3: Impact of race/ethnicity inclusion

- <100 population
- Non-EJ
- Top 25%
- Top 50%
- EJ due to race/ethnicity
- Non-EJ due to race/ethnicity

Comparison of EJ Definitions

	SCAQMD DEFINITION	DEFINITION 1		DEFINITION 2		DEFINITION 3	
		TOP 25%	TOP 50%	TOP 25%	TOP 50%	TOP 25%	TOP 50%
Los Angeles	74.4%	72.1%	70.6%	72.0%	72.5%	75.2%	68.1%
Orange	10.0%	1.0%	5.7%	0.1%	3.9%	4.8%	11.2%
Riverside	5.9%	7.2%	10.0%	7.1%	9.5%	6.6%	8.1%
San Bernardino	9.8%	19.7%	13.7%	20.8%	14.1%	13.5%	12.5%
Total SCAB	100%	100%	100%	100%	100%	100%	100%

Distribution of EJ populations for each proposed definition by county

Comparison of EJ Definitions

	SCAQMD DEFINITION	DEFINITION 1		DEFINITION 2		DEFINITION 3	
		TOP 25%	TOP 50%	TOP 25%	TOP 50%	TOP 25%	TOP 50%
Los Angeles	58.7%	28.3%	57.4%	28.7%	59.3%	31.3%	56.9%
Orange	24.7%	1.3%	14.5%	0.1%	10.0%	6.2%	29.5%
Riverside	25.2%	15.2%	44.1%	15.4%	42.0%	14.9%	36.6%
San Bernardino	47.6%	47.9%	69.0%	51.2%	71.5%	34.6%	64.8%
All Counties in SCAB	47.4%	23.6%	48.9%	24.0%	49.1%	25.0%	50.2%
	Note: Values by definition do not add up to 100%, as this table depicts the percent of county population affected.						

Proportion of county population living in an EJ community by proposed EJ definition

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Comparison of EJ Definitions

NON-EJ TO TOP 50%	NON-EJ TO TOP 25%	TOP 50% TO TOP 25%	TOP 50% TO NON-EJ	TOP 25% TO NON-EJ	TOP 25% TO TOP 50%
Census Tracts					
40 (1.2%)	0	27 (0.8%)	40 (1.2%)	0	27 (0.8%)
Population					
214,302 (1.4%)	0	116,533 (0.7%)	153,968 (1.0%)	0	122,710 (0.8%)

Change in populations defined as EJ between Definition 2 and Definition 2A

Comparison of EJ Definitions

NON-EJ TO TOP 50%	NON-EJ TO TOP 25%	TOP 50% TO TOP 25%	TOP 50% TO NON-EJ	TOP 25% TO NON-EJ	TOP 25% TO TOP 50%
Census Tracts					
40 (1.2%)	0	31 (0.9%)	40 (1.2%)	0	31 (0.9%)
Population					
187,295 (1.2%)	0	131,825 (0.8%)	178,424 (1.1%)	0	125,079 (0.8%)

Change in populations defined as EJ between Definition 3 and Definition 3A

Sensitivity Analyses

- Each of these definition types can be used as a sensitivity analysis to compare with EJ areas as defined by SCAQMD.

- Alternative definitions were designed to include alternative environmental and demographic indicators incrementally.

- Alternative definitions were built from SCAQMD's current grant distribution definition of EJ for ease of sensitivity analysis comparison.

- Identification of EJ areas based on these alternative definitions were calculated using a commonly used methodology, CalEnviroScreen2.0.

Conclusions

- Inclusion of Race and Ethnicity as one of seven sociodemographic indicators does not change the EJ status of > 98% of census tracts.

- Inclusion of the Race and Ethnicity indicator keeps EJ-defined areas closer to the urban core by excluding some large rural census tracts.

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