

# IDENTIFYING IMPACTED COMMUNITIES TECHNICAL WORKSHOP

BAY AREA AIR QUALITY MANAGEMENT DISTRICT  
CARE TASK FORCE MEETING

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CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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# OEHHA's December 2010 Report

## CUMULATIVE IMPACTS: BUILDING A SCIENTIFIC FOUNDATION



December 2010

Linda S. Adams, Secretary  
California Environmental Protection Agency

Joan E. Denton, Ph.D., Director  
Office of Environmental Health Hazard Assessment



## Primary audience:

- ARB
- DPR
- DTSC
- SWRCB

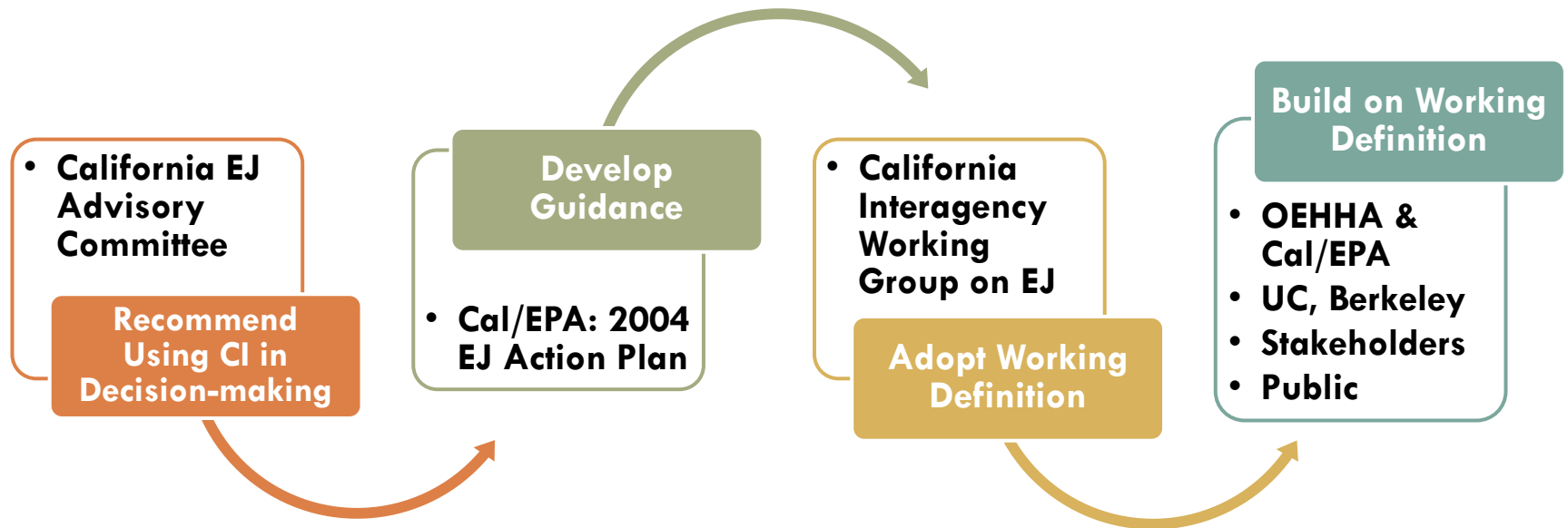
## Available at:

<http://oehha.ca.gov/ej>

# Program Origins in Environmental Justice

- Statutory definition of EJ
  - ▣ “Environmental justice means the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation and enforcement of environmental laws, regulations, and policies.”  
Gov. Code §65040.12(e)
- Cal/EPA’s responsibilities
  - ▣ Required development of interagency environmental justice strategy for Cal/EPA
  - ▣ Required each of the Cal/EPA boards and departments to review, identify, and address program obstacles impeding the progress of environmental justice  
Public Resources Code §71113

# How We Got Here (Process)

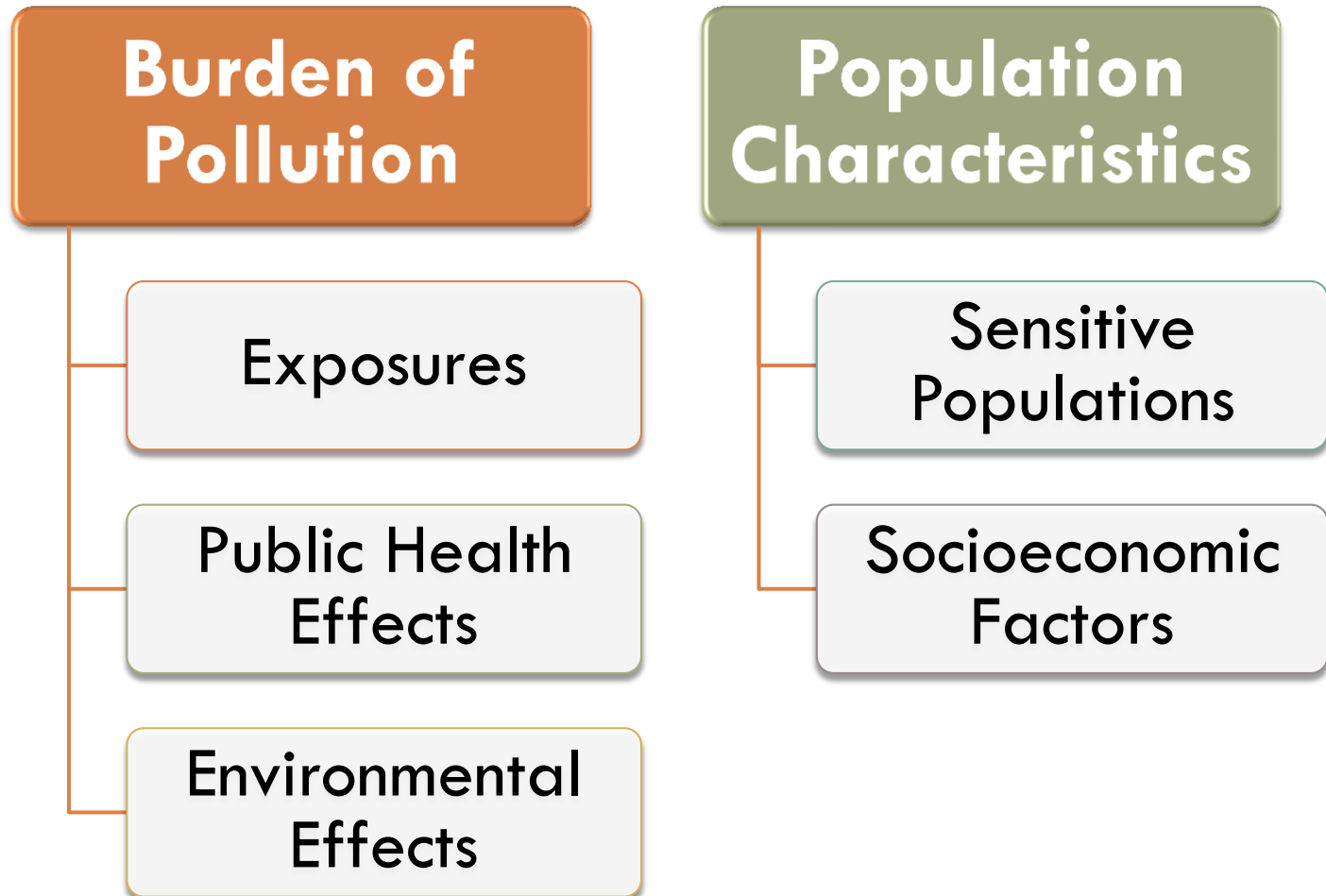


# Working Definition

“Cumulative impacts means **exposures, public health or environmental effects** from the combined **emissions and discharges** in a **geographic area**, including environmental **pollution** from all **sources**, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts will take into account **sensitive populations** and **socioeconomic factors**, where applicable and to the extent data are available.”

-- Cal/EPA Interagency Working Group on Environmental Justice

# Primary Components



# Interpretation of Major Terms

## Exposures

- *Contact with pollution*

## Public Health Effects

- *Disease and other health conditions influenced by exposure to pollutants*

## Environmental Effects

- *Adverse environmental conditions caused by pollutants*

# Interpretation of Major Terms

## Sensitive Populations

- *Populations with biological traits that may magnify the effects of pollutant exposures*

## Socioeconomic Factors

- *Community characteristics that result in increased vulnerability to pollutants*



# Lines of Scientific Evidence

- Pollution and public health effects
- Disparities in exposure and environmental conditions
- Sensitivity based on biological or physiological factors
- Sensitivity based on socially-derived factors
- Health disparities



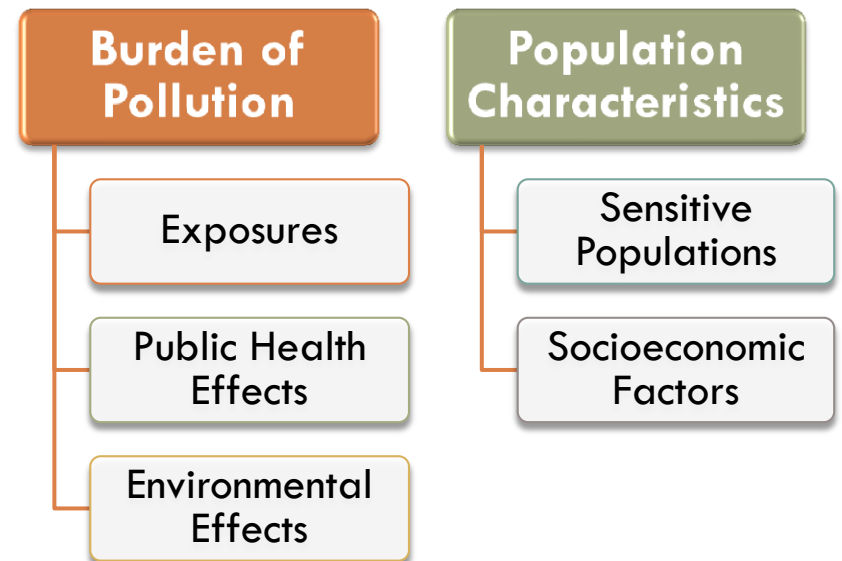
# Screening Method

# Objectives

- Keep it relatively simple (!)
- Geography-based assessment
  - ▣ Roughly community-scale
- Contributions to impact from multiple media
  - ▣ Air, water, soil
- Find data to represent each of our 5 components
- Combine the information

# Data

- Publicly available
- Statewide
- Resolution
  - ▣ ZIP code/ZCTA
  - ▣ Census tract
- Current
- Meaningful




# Indicators for Components

Exposures	Public Health Effects	Environmental Effects	Sensitive Populations	Socio-economic Factors
<ul style="list-style-type: none"> <li><input type="checkbox"/> Ozone concentrations</li> <li><input type="checkbox"/> PM 2.5 concentrations</li> <li><input type="checkbox"/> Traffic density</li> <li><input type="checkbox"/> Pesticide use</li> <li><input type="checkbox"/> Toxic emissions from facilities</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Low birth weight rate</li> <li><input type="checkbox"/> Asthma ER visit rate</li> <li><input type="checkbox"/> Heart disease mortality rate</li> <li><input type="checkbox"/> Cancer mortality rate</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Clean-up sites (brownfields)</li> <li><input type="checkbox"/> Leaking underground storage tanks and cleanups</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Percent under age 5</li> <li><input type="checkbox"/> Percent over age 65</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Educational attainment</li> <li><input type="checkbox"/> Median household income</li> <li><input type="checkbox"/> Percent residents below 2x national poverty level</li> </ul>

# Relationship



# Range of Scores for Components



Component	Range of Possible Scores
Exposures	1-10
Environmental effects	1-5
Public health effects	1-5
<hr/>	
Sensitive populations	1-3
Socioeconomic factors	1-3
<b>Cumulative impact</b>	<b>6-120</b>

The table is annotated with blue plus signs and brackets on the left side. A plus sign and bracket group the first three rows (Exposures, Environmental effects, Public health effects). Another plus sign and bracket group the next two rows (Sensitive populations, Socioeconomic factors). The final row (Cumulative impact) is not grouped.

# 2010 Results for 28 Sample Communities

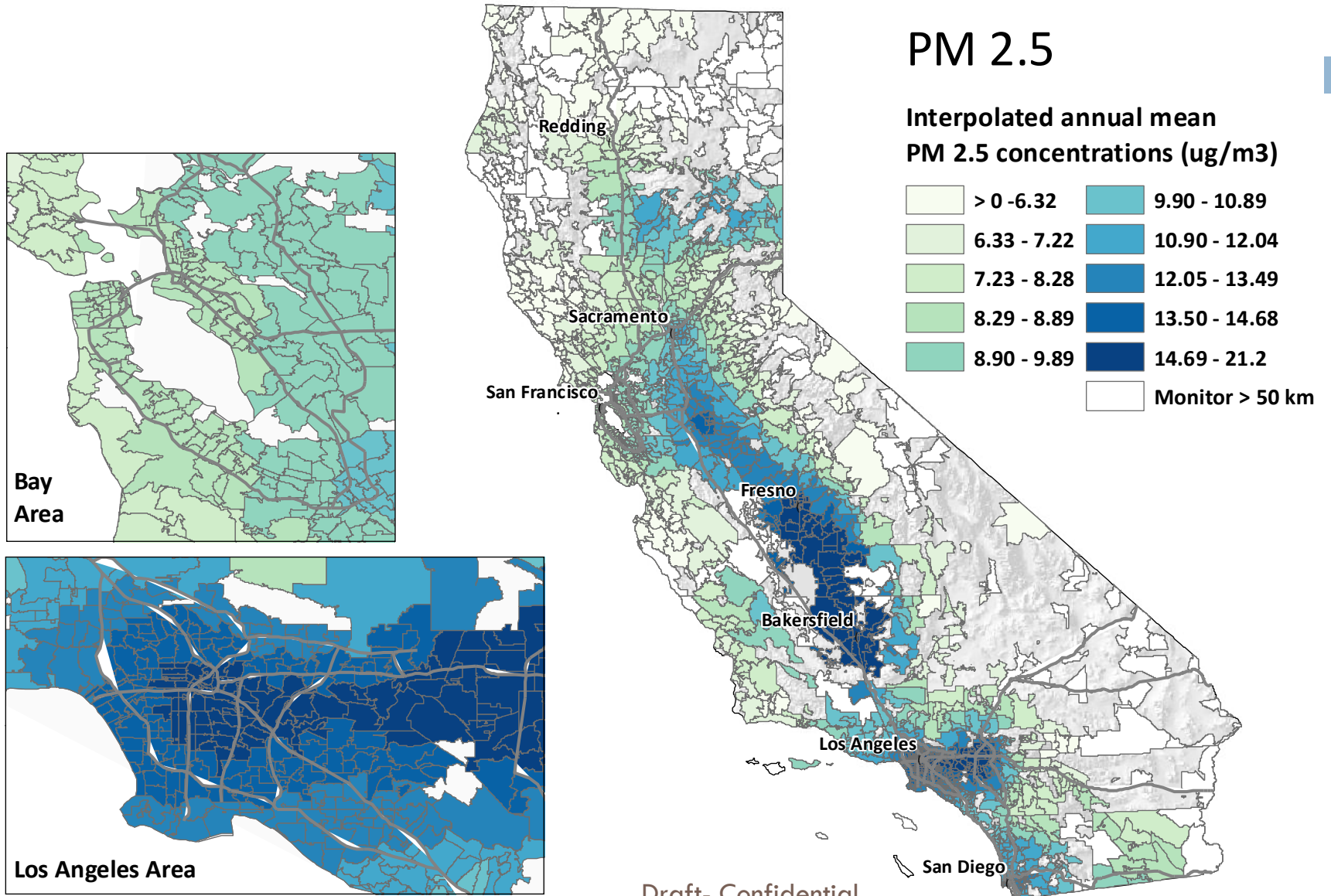
	Community																												
Component	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A A	B B	
Exposures	7	5	8	7	6	4	7	6	8	3	6	6	5	4	6	4	7	7	4	3	3	5	4	4	5	4	5	3	
Public Health Effects	5	5	5	3	4	5	3	5	3	4	3	4	3	3	1	3	3	2	3	2	2	4	3	2	2	1	1	2	
Environmental Effects	3	4	3	3	3	4	4	2	1	5	2	1	5	1	5	2	1	1	3	4	2	2	3	1	1	1	2	1	
Contributors to Burden	15	14	16	13	13	13	14	13	12	12	11	11	13	8	12	9	11	10	10	9	7	11	10	7	8	6	8	6	
Sensitive Populations	3	3	2	3	3	3	2	2	2	2	2	3	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	1	
Socioeconomic Factors	3	3	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2	2	2	2	2	3	1	1	2	1	2	1	2
Contributors to Pop. Character.	6	6	5	6	6	6	5	5	5	5	5	5	4	6	4	5	4	4	4	4	4	5	3	3	4	3	4	3	3
Composite Score	90	84	80	78	78	78	70	65	60	60	55	55	52	48	48	45	44	40	40	36	35	33	30	28	24	24	24	18	



# Particulate Matter (PM 2.5)

- Air Resources Board's Air Monitoring Network
- **Indicator:** Annual mean concentrations of PM 2.5
  - ▣ Interpolated from nearest monitors to ZCTA centroids by ARB
  - ▣ Three year (2007-2010) average
- Assign a percentile (>0 – 100) to all California ZIP codes

# Statewide Map



Draft- Confidential

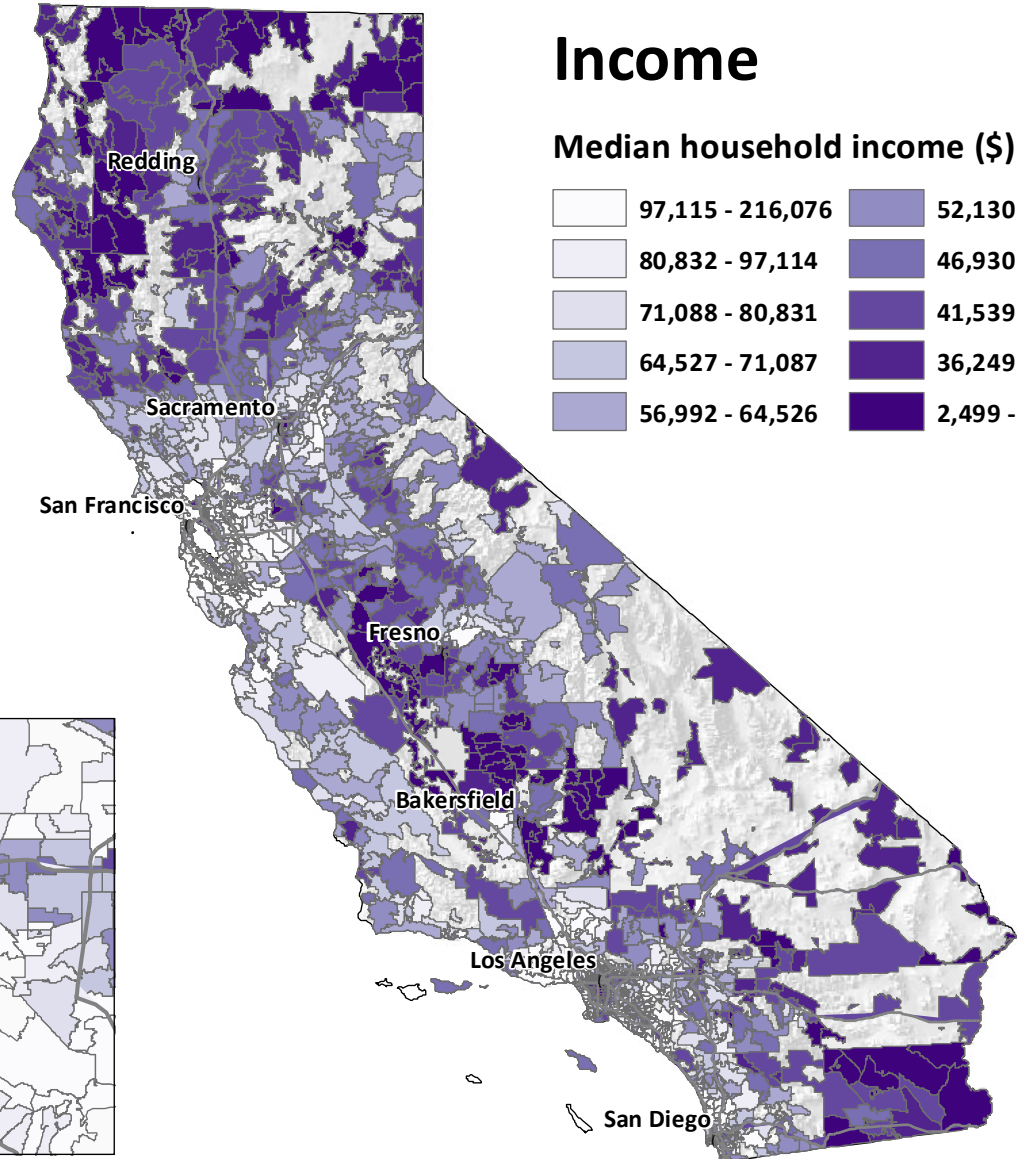
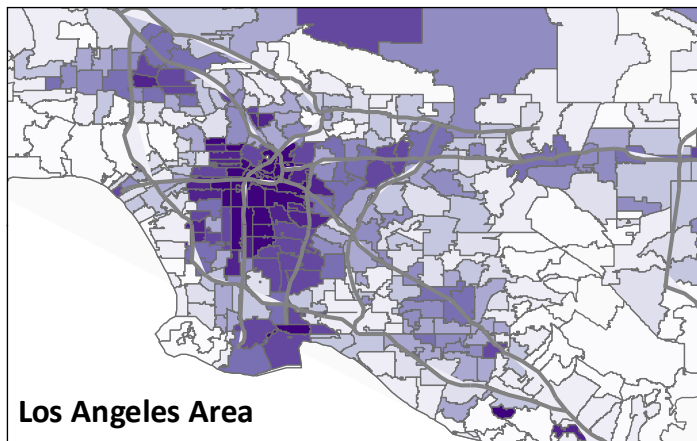
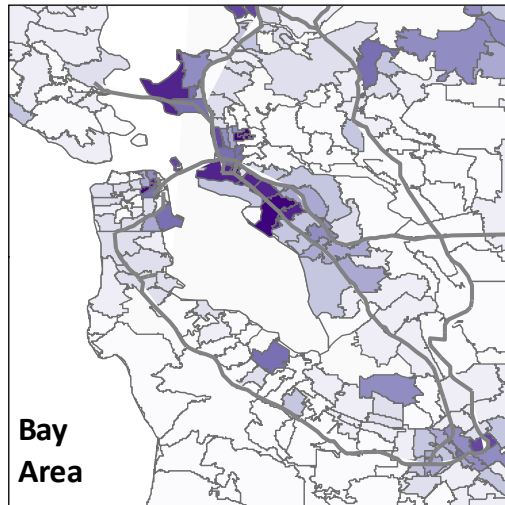
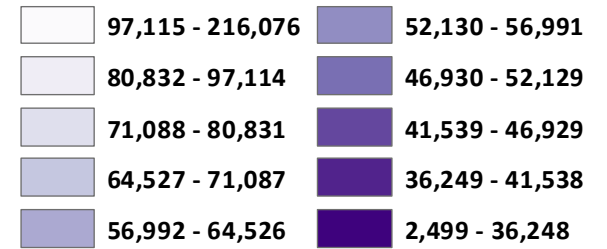
# Income

- U.S. Census Bureau's American Community Survey
- **Indicator:** Median household income
  - ▣ Five year, 2006-2010, estimates
- Assign a percentile ( $>0 - 100$ ) to all California ZIP codes

# Statewide Map

## Income

Median household income (\$)



# Uses for Screening Method

- Distinguish higher-impacted from lower-impacted communities
- Identify which of the components are likely to contribute the most to the community's cumulative impact
- Support intra-agency efforts to address multi-media impacts.

# Environmental Decision-making

Cumulative Impacts and Decision-making at  
Cal/EPA

# Types of Decision-making

- Prioritization
  - ▣ Site Clean-up
  - ▣ Enforcement
  - ▣ Environmental Monitoring
  - ▣ Financial Assistance
  - ▣ Outreach
- Risk Assessment and Standard-Setting
- Permitting
- Other?

# Next Steps to Move Ahead

- Continue developing the cumulative impacts tool and related guidance through an open and public process.
- Share current status of information with Cumulative Impacts and Precautionary Approaches Workgroup
- Receive input and suggestions on preliminary work product method and indicators.
- Conduct workshops throughout the state on preliminary work product method and indicators.



# Next Steps to Move Ahead

- Review and consider comments from Cal/EPA boards and departments, CIPA workgroup, and public.
- Further develop and refine the tool, and develop the guidance for use of the methodology within the agency.
- Work with communities, local, state and federal agencies, interested stakeholders
  - ▣ Better define cumulative impacts for the community
  - ▣ Identify best applications for the approach
  - ▣ Identify solutions to address the impacts

# CI Project Team

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# Questions, Comments & Discussion