



CAENVIROSCREEN 2.0 | PUBLIC REVIEW DRAFT

April 30, 2014



CALENVIROSCREEN 1.1

CALIFORNIA COMMUNITIES ENVIRONMENTAL HEALTH SCREENING TOOL, VERSION 1.1 (CALENVIROSCREEN 1.1)

GUIDANCE AND SCREENING TOOL



September 2013 Update

Matthew Rodriguez, Secretary
California Environmental Protection Agency

George V. Alexeeff, Ph.D., Director
Office of Environmental Health Hazard Assessment



- Broad picture of the relative burdens California communities face from environmental pollution
- 17 indicators of environmental, health, and socioeconomic conditions
- ZIP code scale
- Guidance on potential uses of tool

FOCUS OF CALENVIROSCREEN

“...**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.”

-- Working definition of
“cumulative impacts” by
Cal/EPA Interagency
Working Group on
Environmental Justice



BASIS OF ENVIRONMENTAL JUSTICE CONCERNS

- Multiple pollution sources are disproportionately concentrated in low-income communities with high-minority populations.
- Communities with certain socioeconomic factors (i.e. low-income, low-education) have increased sensitivity to pollution.
- Combination of multiple pollutants and increased sensitivity in these communities can result in greater cumulative pollution impacts.

CRITERIA FOR INDICATOR SELECTION

- Provide a good measure of environmental or socioeconomic conditions
 - Pollution indicators should relate to issues that may be actionable by Cal/EPA
- Publicly available
- Statewide
- Location-based information (e.g., address, latitude/longitude)
- Good quality data (e.g., covers the state, accurate, current)



CAL ENVIRO SCREEN 1.1 INDICATORS

<i>Pollution Burden</i>		<i>Population Characteristics</i>	
Exposures	Environmental Effects	Sensitive Populations	Socioeconomic Factors
<ul style="list-style-type: none"> <input type="checkbox"/> PM 2.5 concentrations <input type="checkbox"/> Ozone concentrations <input type="checkbox"/> Diesel PM emissions <input type="checkbox"/> Pesticide use <input type="checkbox"/> Toxic releases from facilities <input type="checkbox"/> Traffic density 	<ul style="list-style-type: none"> <input type="checkbox"/> Cleanup sites <input type="checkbox"/> Groundwater threats (Leaking underground tanks and cleanups) <input type="checkbox"/> Impaired water bodies <input type="checkbox"/> Solid waste sites and facilities <input type="checkbox"/> Hazardous waste facilities and generators 	<ul style="list-style-type: none"> <input type="checkbox"/> Prevalence of children and elderly <input type="checkbox"/> Asthma emergency department visit rate <input type="checkbox"/> Rate of low birth weight births 	<ul style="list-style-type: none"> <input type="checkbox"/> Educational attainment <input type="checkbox"/> Linguistic isolation <input type="checkbox"/> Poverty: Percent residents below 2x national poverty level



RELATIVE SCORING METHOD

- Calculate relative score for each indicator (percentiles)
- Combine indicators together to calculate overall CalEnviroScreen score

Components	Maximum Score
Exposures & Environmental Effects (½)	10
Sensitive Populations & Socioeconomic Factors	10
CalEnviroScreen Score	Up to 100 (= 10 x 10)

- CalEnviroScreen scores allow comparison of relative scores between different areas





SOME USES OF TOOL

- To aid ongoing planning and decision-making within CalEPA
 - Environmental Justice Small Grant program
 - Prioritize CalEPA activities
- Strategic Growth Council
 - First use of CalEnviroScreen outside of CalEPA
- SB 535 (De Leon, 2012)
 - CalEPA shall identify “disadvantaged communities” for investment opportunities based on geographic, socioeconomic, public health and environmental hazard criteria.



PROPOSED CHANGES FOR CALENVIROSCREEN 2.0

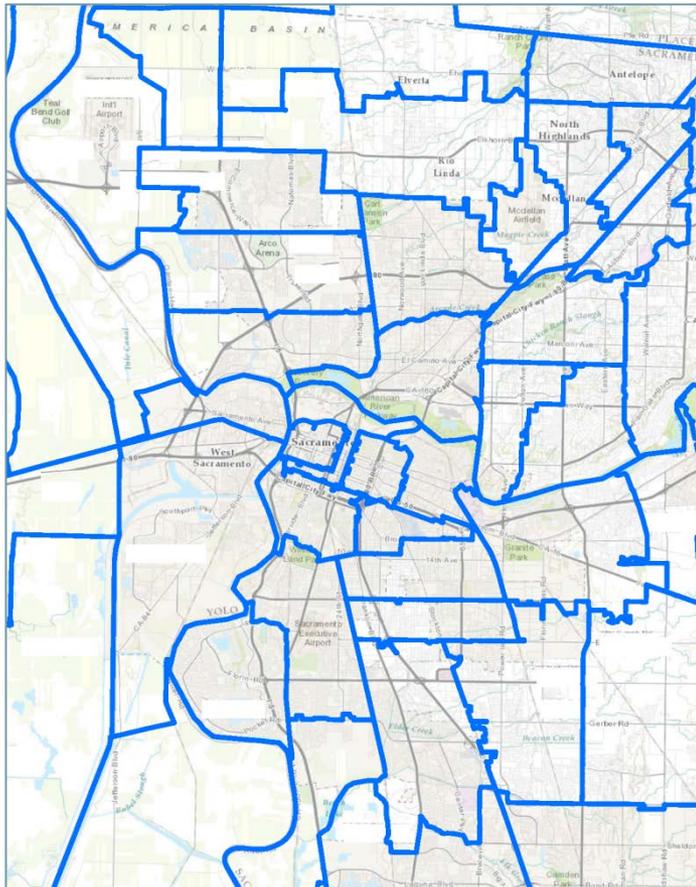
PROPOSED CHANGES

- ZIP code ⇒ census tracts
- More recent data, when available
- Better toxic release data
- Proximity adjustment to where people live of environmental hazards
- New indicators
 - *Drinking water quality*
 - *Unemployment rate*
- Additional data for tribal lands

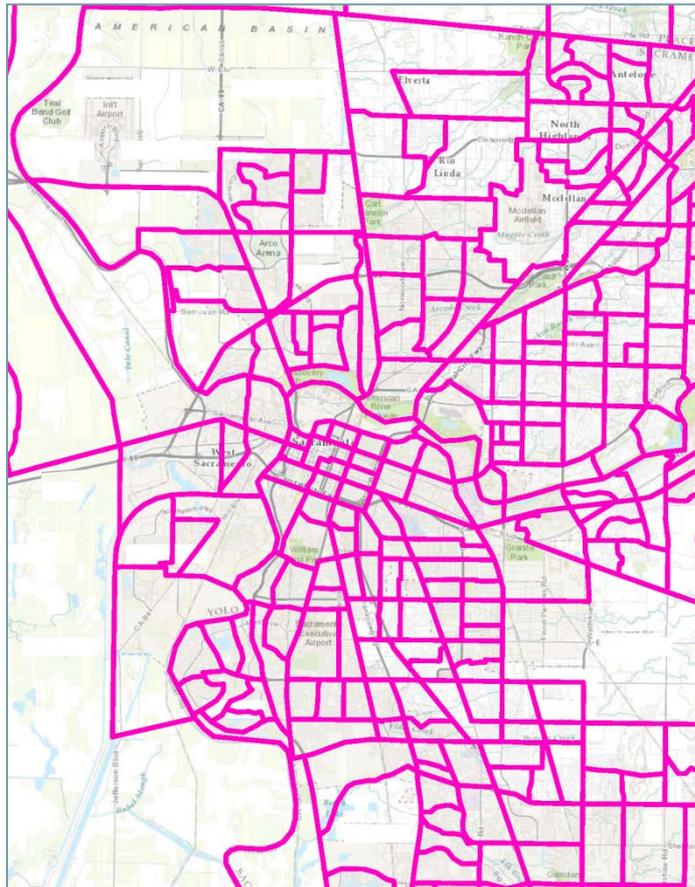


ZIP CODES ⇨ CENSUS TRACTS

ZIP CODE SCALE



CENSUS TRACT SCALE



CAL ENVIROSCREEN 2.0 INDICATORS

<i>Pollution Burden</i>		<i>Population Characteristics</i>	
Exposures	Environmental Effects	Sensitive Populations	Socioeconomic Factors
<ul style="list-style-type: none"> <input type="checkbox"/> PM 2.5 concentrations <input type="checkbox"/> Ozone concentrations <input type="checkbox"/> Diesel PM emissions <input type="checkbox"/> Pesticide use <input type="checkbox"/> Toxic releases from facilities <input type="checkbox"/> Traffic density <input type="checkbox"/> Drinking water quality 	<ul style="list-style-type: none"> <input type="checkbox"/> Cleanup sites <input type="checkbox"/> Groundwater threats (Leaking underground tanks and cleanups) <input type="checkbox"/> Impaired water bodies <input type="checkbox"/> Solid waste sites and facilities <input type="checkbox"/> Hazardous waste facilities and generators 	<ul style="list-style-type: none"> <input type="checkbox"/> Prevalence of children and elderly <input type="checkbox"/> Asthma emergency department visit rate <input type="checkbox"/> Rate of low birth weight births 	<ul style="list-style-type: none"> <input type="checkbox"/> Educational attainment <input type="checkbox"/> Linguistic isolation <input type="checkbox"/> Poverty: Percent residents below 2x national poverty level <input type="checkbox"/> Unemployment rate



EXPOSURE INDICATORS

Indicator	Proposed Changes
<i>Air Quality: Ozone</i>	Model to census tract; new year of data
<i>Air Quality: PM2.5</i>	Model to census tract; new year of data
<i>Diesel Particulate Matter</i>	Allocate to census tract
<i>Pesticide Use</i>	Allocate to census tract; added 3 pesticides, new year of data
<i>Traffic Density</i>	Allocate to census tract
<i>Toxic Releases from Facilities</i>	Use modeled risk screening environmental indicators from U.S. EPA
<i>Drinking Water Quality</i>	New indicator: Toxicity-weighted water quality

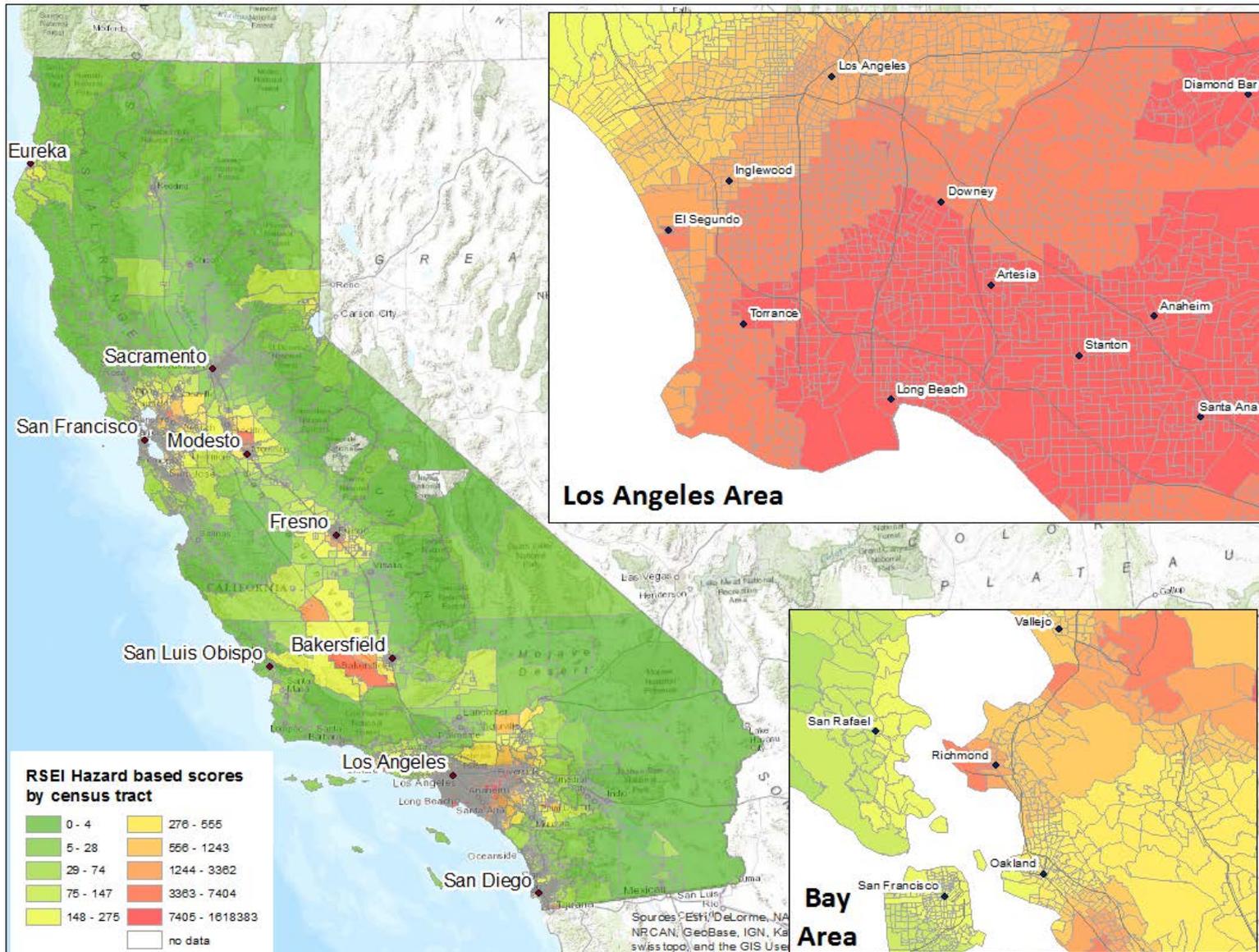


TOXIC RELEASES INDICATOR: RSEI

- Transition to U.S. EPA's Risk Screening Environmental Indicators (RSEI)
 - Uses Toxic Release Inventory (TRI) release data
 - Uses emission locations and weather to model how chemicals spread in air (in 810m-square grid units)
 - Combines air concentrations with toxicity factors
- Improvements offered by using RSEI data
 - Comprehensive modeling of chemical dispersion
 - Improvements in accuracy of facility locations and stack heights



TOXIC RELEASE DISTRIBUTION (RSEI)



DRINKING WATER QUALITY INDICATOR

Tiers of Geographic Boundaries

More Information Available

Public Water Systems:
A) Known service boundaries
B) Approximated service boundaries

“Delivered” Community Water Systems Sources

- Treated
- If treated not available:
 - Combined wells
 - Untreated wells
 - Raw wells, if others not available

Groundwater Basins:
C) Approximated systems using township boundaries

All Public Water System Sources

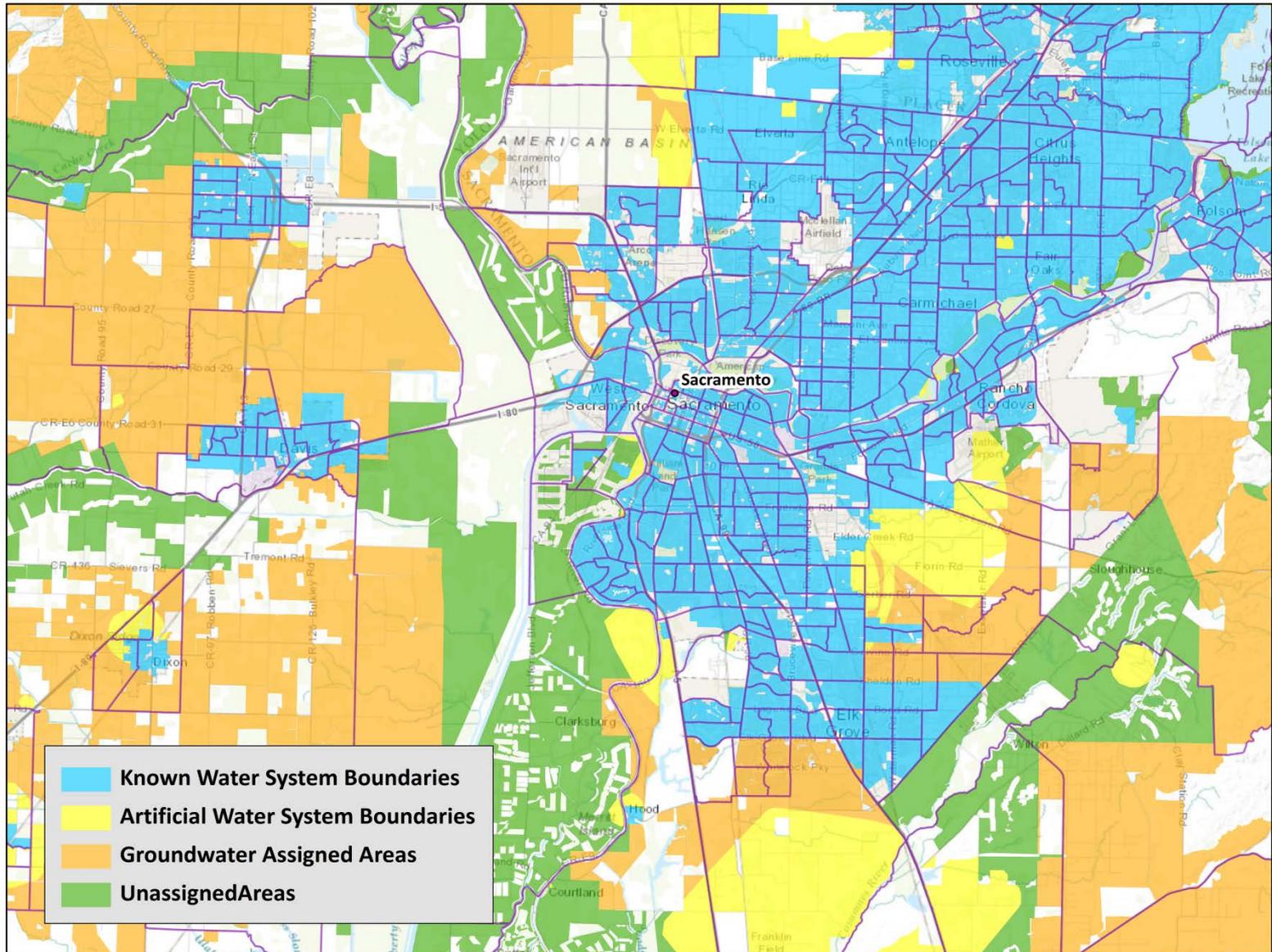
- Any available ambient groundwater data

Data from other groundwater quality projects:

- USGS Priority Basins
- GAMA Domestic Well Project

Less Information Available

DRINKING WATER SYSTEM BOUNDARIES



DRINKING WATER QUALITY

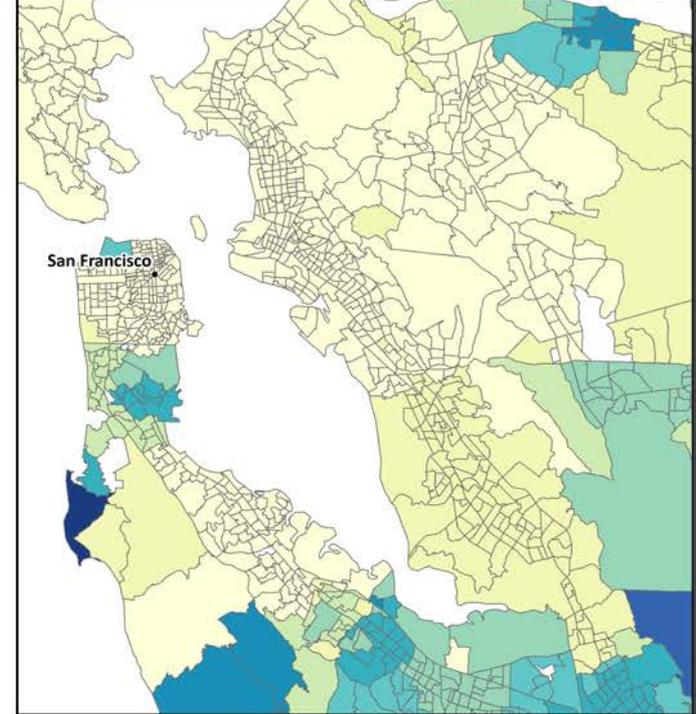
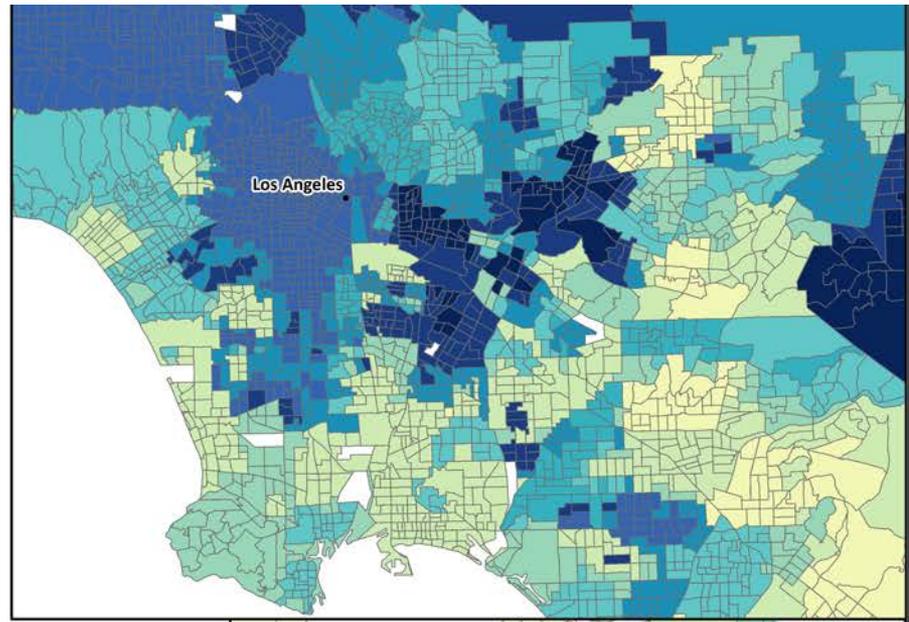
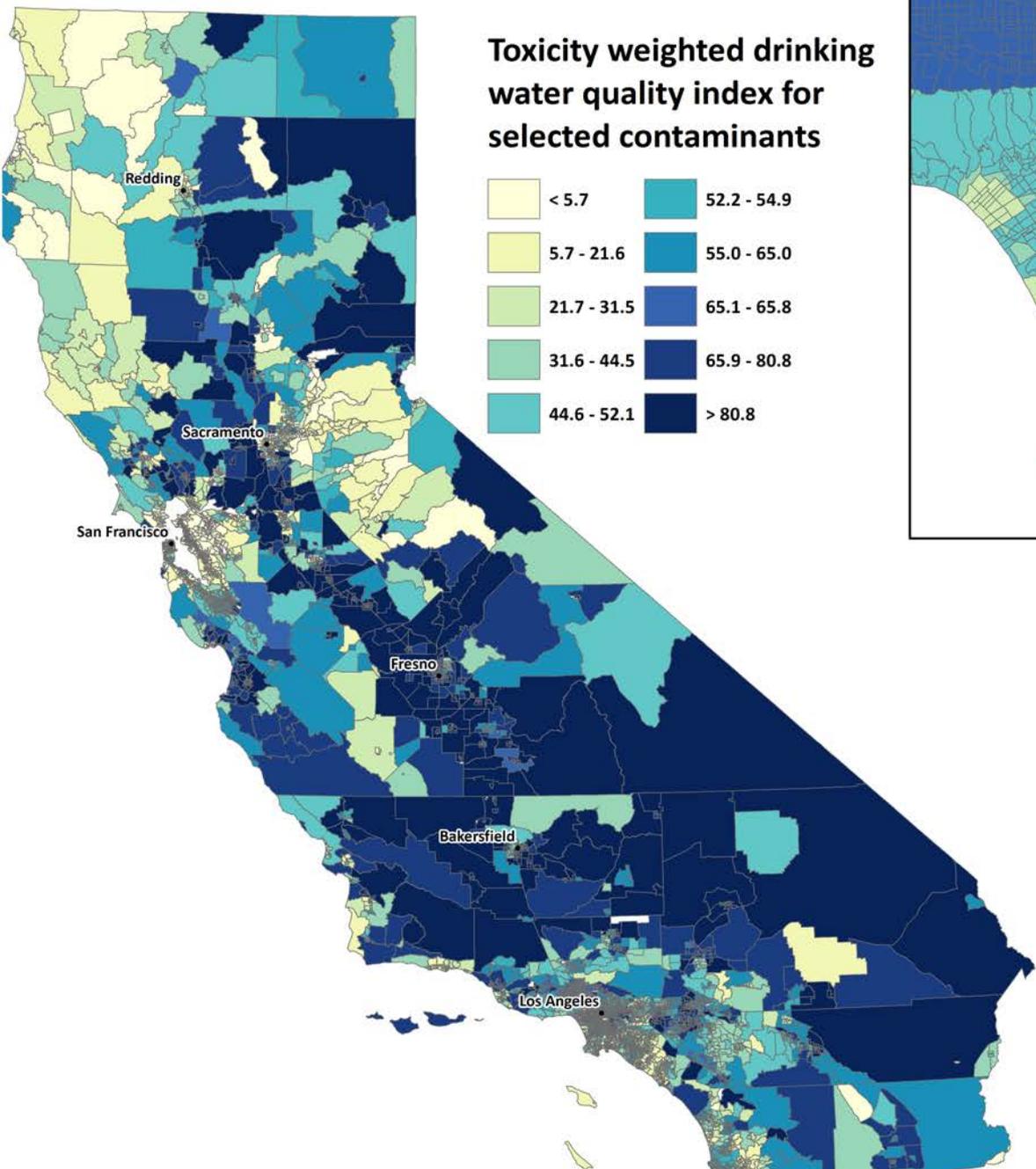
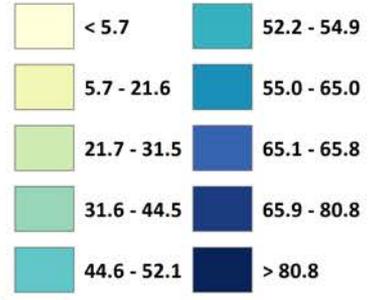
- Join systems with delivered water quality data (2008-2013)
- Score delivered water with a toxicity-weighted water quality index
 - Public Health Goals (PHGs) used for relative toxicity
 - Carcinogens and non-carcinogens evaluated separately

Carcinogenic Contaminants	PHG
Arsenic	0.004 µg/l
Benzene	0.15 µg/l
Cadmium	0.04 µg/l
Carbon Tetrachloride	0.1 µg/l
Dibromochloropropane (DBCP)	0.0017 µg/l
Hexavalent Chromium	0.02 µg/l
Methyl-tert-Butyl-Ether (MTBE)	13 µg/l
Radium-226	0.05 pCi/l
Tetrachloroethylene (PCE)	0.06 µg/l
Total Trihalomethanes (THM)	0.8 µg/l*
Trichloroethylene (TCE)	1.7 µg/l
Uranium	0.43 pCi/l

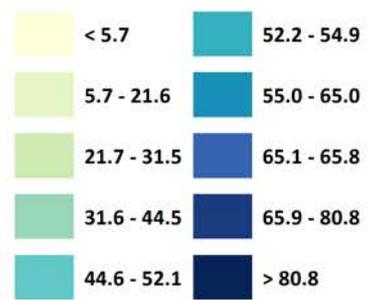
Non-Carcinogenic Contaminants	PHG
Barium	2 mg/l
Lead	0.2 µg/l
Mercury	1.2 µg/l
Nitrate (NO ₃)	45 mg/l
Perchlorate	6 µg/l
Toluene	150 µg/l
Total Coliform Rule Violation	--
Xylene	1800 µg/l



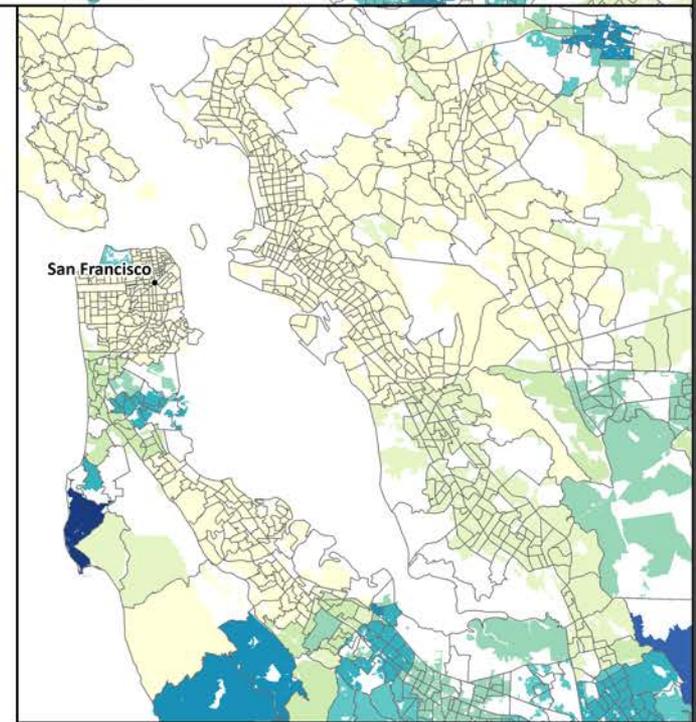
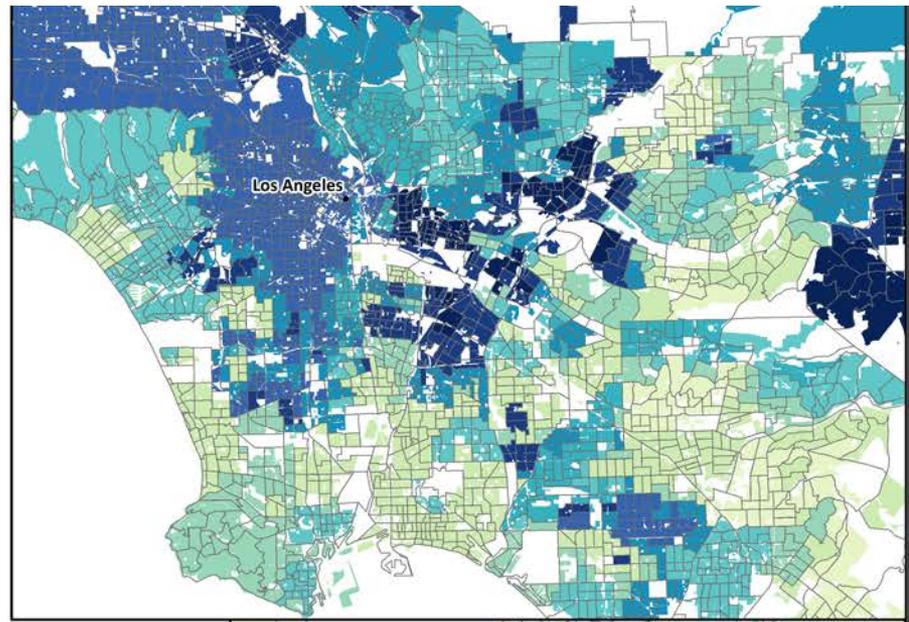
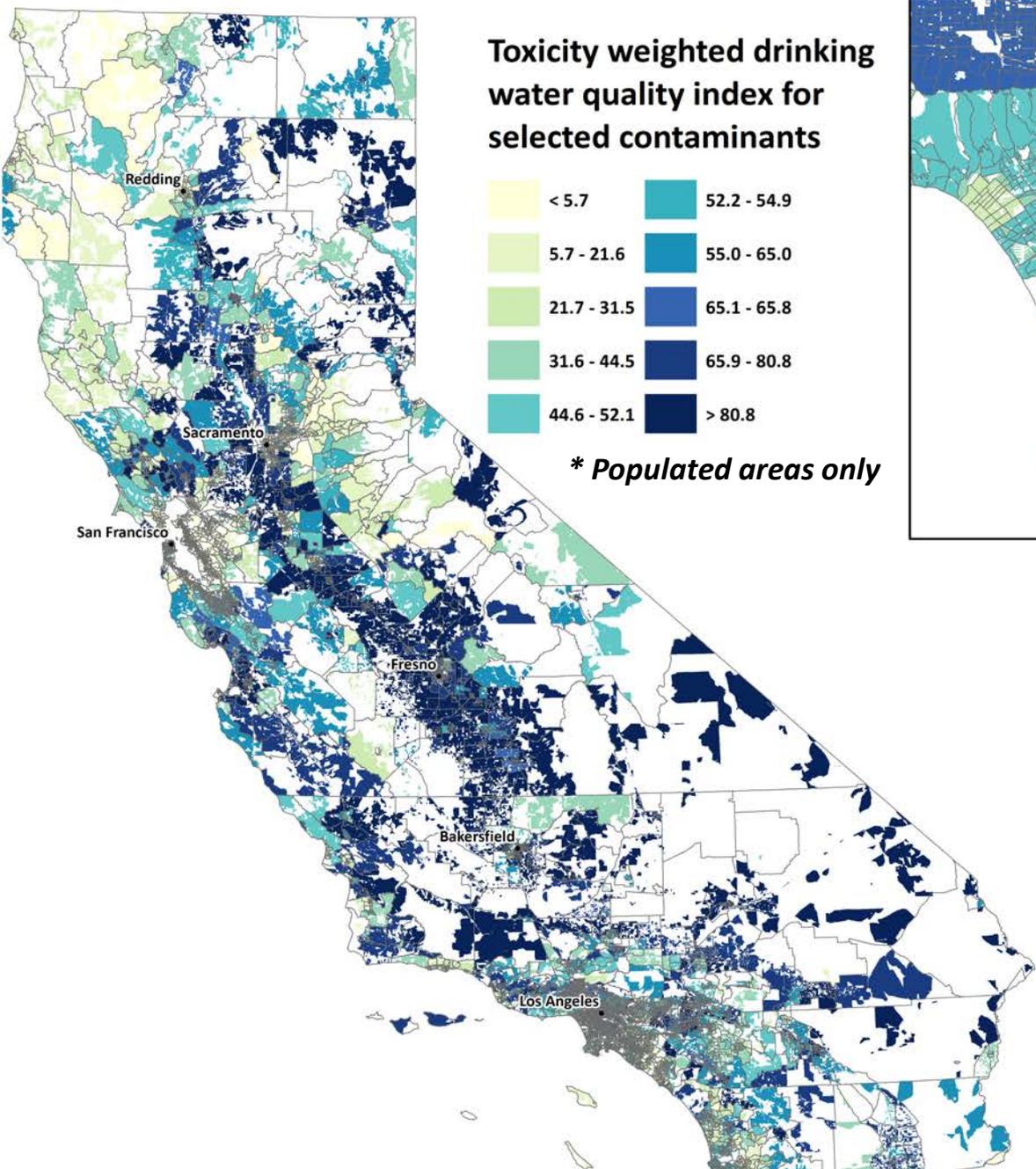
Toxicity weighted drinking water quality index for selected contaminants



Toxicity weighted drinking water quality index for selected contaminants



** Populated areas only*



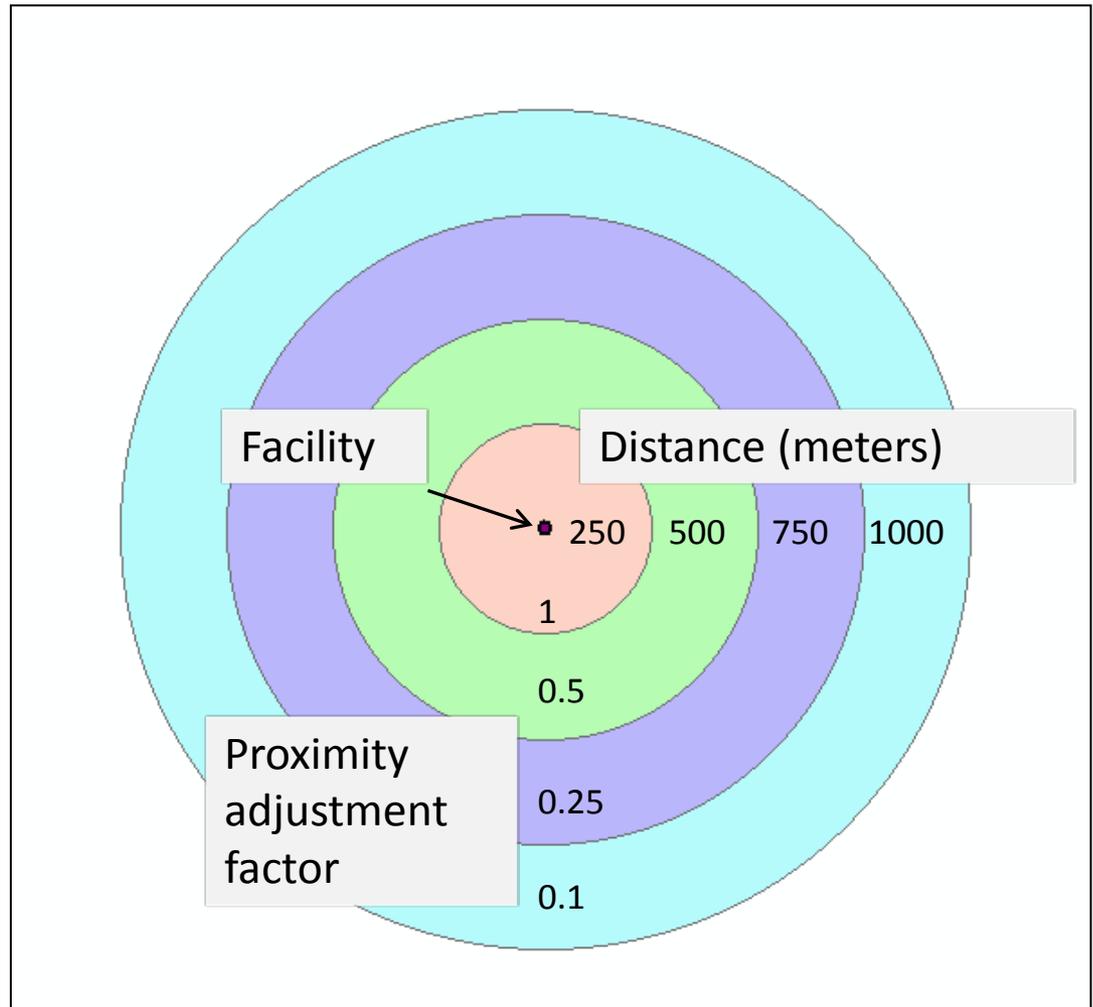
ENVIRONMENTAL EFFECTS INDICATORS

Indicator	Proposed Changes
<i>Cleanup Sites</i>	Apply adjustment to sites based on distance from people; allocate to census tracts; update data
<i>Hazardous Waste Facilities and Generators</i>	Hazardous waste generators: Allocate to census tracts; remove small quantity generators; new year data
	Permitted hazardous waste handling facilities: Apply adjustment to facilities based on distance from people; allocate to census tract
<i>Solid Waste Sites and Facilities</i>	Apply adjustment to facilities based on distance from people; allocate to census tracts; update data
<i>Impaired Water Bodies</i>	Allocate to census tracts
<i>Groundwater Threats</i>	Apply adjustment to sites based on distance from people; allocate to census tracts; update data



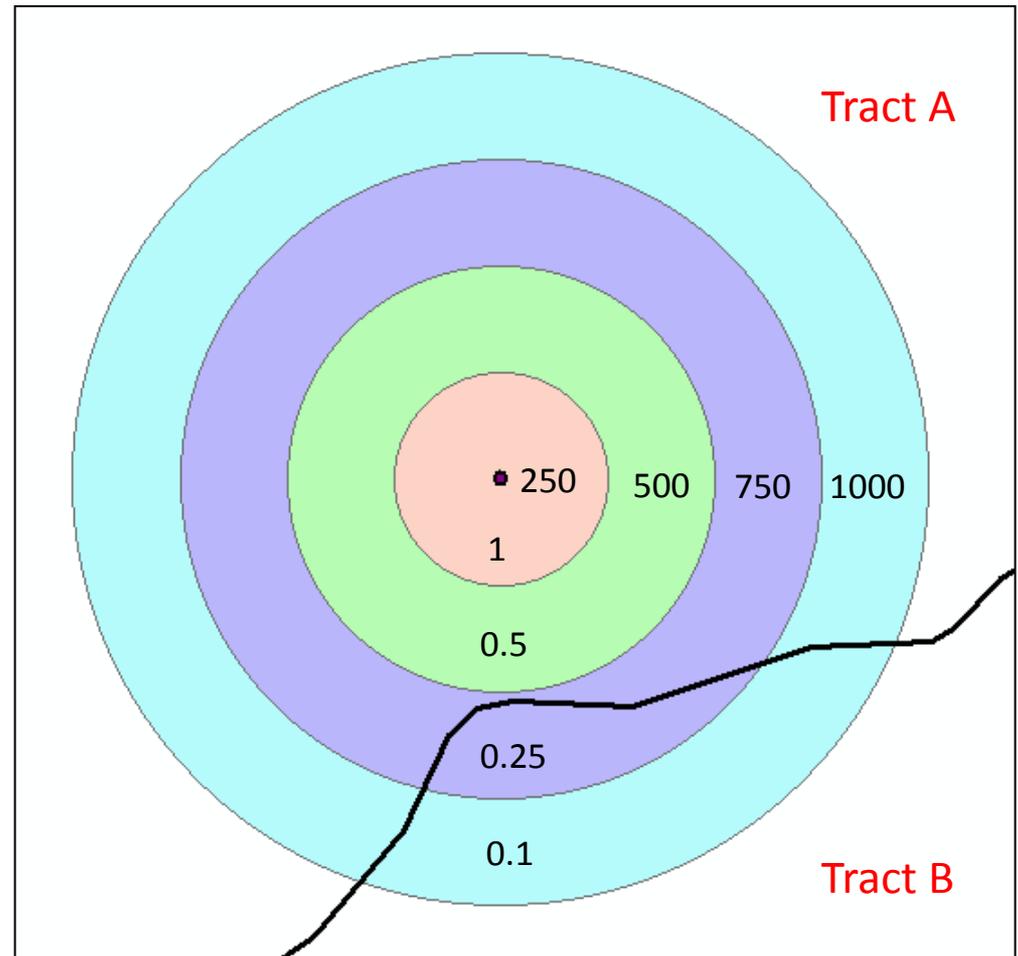
ADJUSTMENT FOR PROXIMITY TO PEOPLE

- Multi-ring buffer with proximity adjustment factors
- Facility buffer must touch populated census block to be counted in score
- Applies to *Cleanups*, *Groundwater Threats*, *Solid Waste*, *Hazardous Waste* indicators



TRACTS ASSIGNED CLOSEST PROXIMITY ADJUSTMENT

- *Example:* Facility with weight of '4' is in Tract A, but close to Tract B.
- Contribution to tract = (facility weight) × (adjustment factor)
 - *Tract A:* $4 \times 1 = 4$
 - *Tract B:* $4 \times 0.25 = 1$
- *Proximity-adjusted scores from all facilities are summed across the tract*



SENSITIVE POPULATIONS INDICATORS

Indicator	Proposed Changes
<i>Age: Children and Elderly</i>	Census tract values
<i>Asthma Emergency Department Visits</i>	Allocate ZIP code data to census tracts
<i>Low Birth Weight Infants</i>	Spatially modeled to census tract calculate more reliable estimates, especially for tracts with few births



SOCIOECONOMIC FACTOR INDICATORS

Indicator	Proposed Changes
<i>Educational Attainment</i>	Census tract estimates; update to (2008-2012)
<i>Linguistic Isolation</i>	Census tract estimates; update to (2008-2012)
<i>Poverty</i>	Census tract estimates; update to (2008-2012)
<i>Unemployment</i>	New indicator: Unemployment rate census tract estimates (2008-2012)

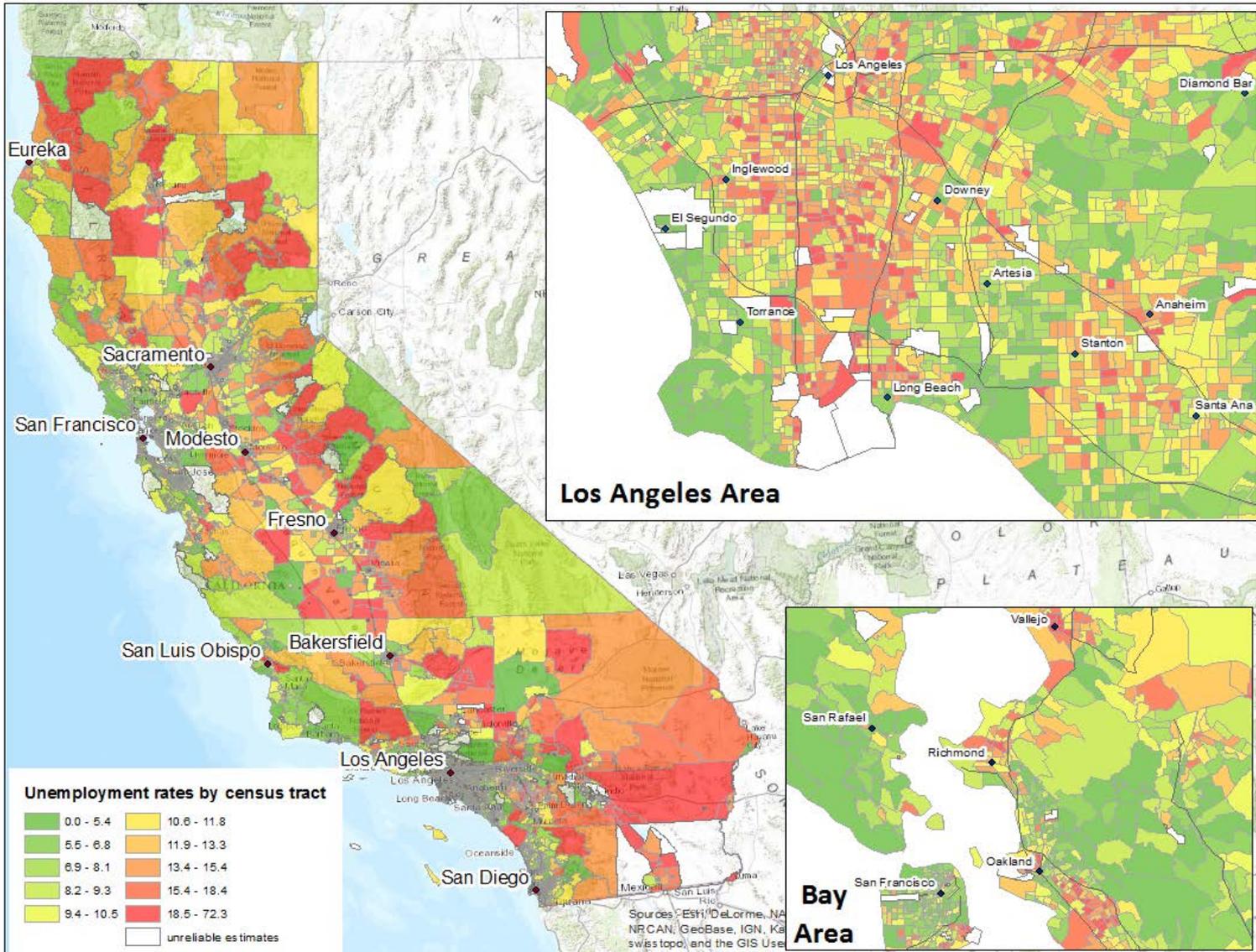


UNEMPLOYMENT

- Evidence showing increased likelihood of underlying physical and mental health problems among unemployed
 - Greater susceptibility to exposures of environmental pollution
- Some degree of correlation with poverty and education attainment, indicating a unique contribution
- Unemployment data from U.S. Census Bureau's American Community Survey
 - 5-Year estimates at the census tract level (2008-2012)
 - Population over 16 in the civilian labor force. Labor force excludes students, homemakers, volunteer workers, institutionalized, military on active duty, retired, and people not looking for work.

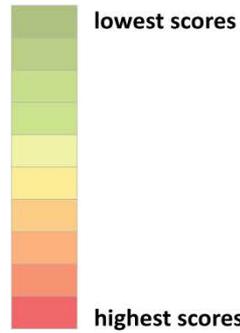


UNEMPLOYMENT RATE RESULTS

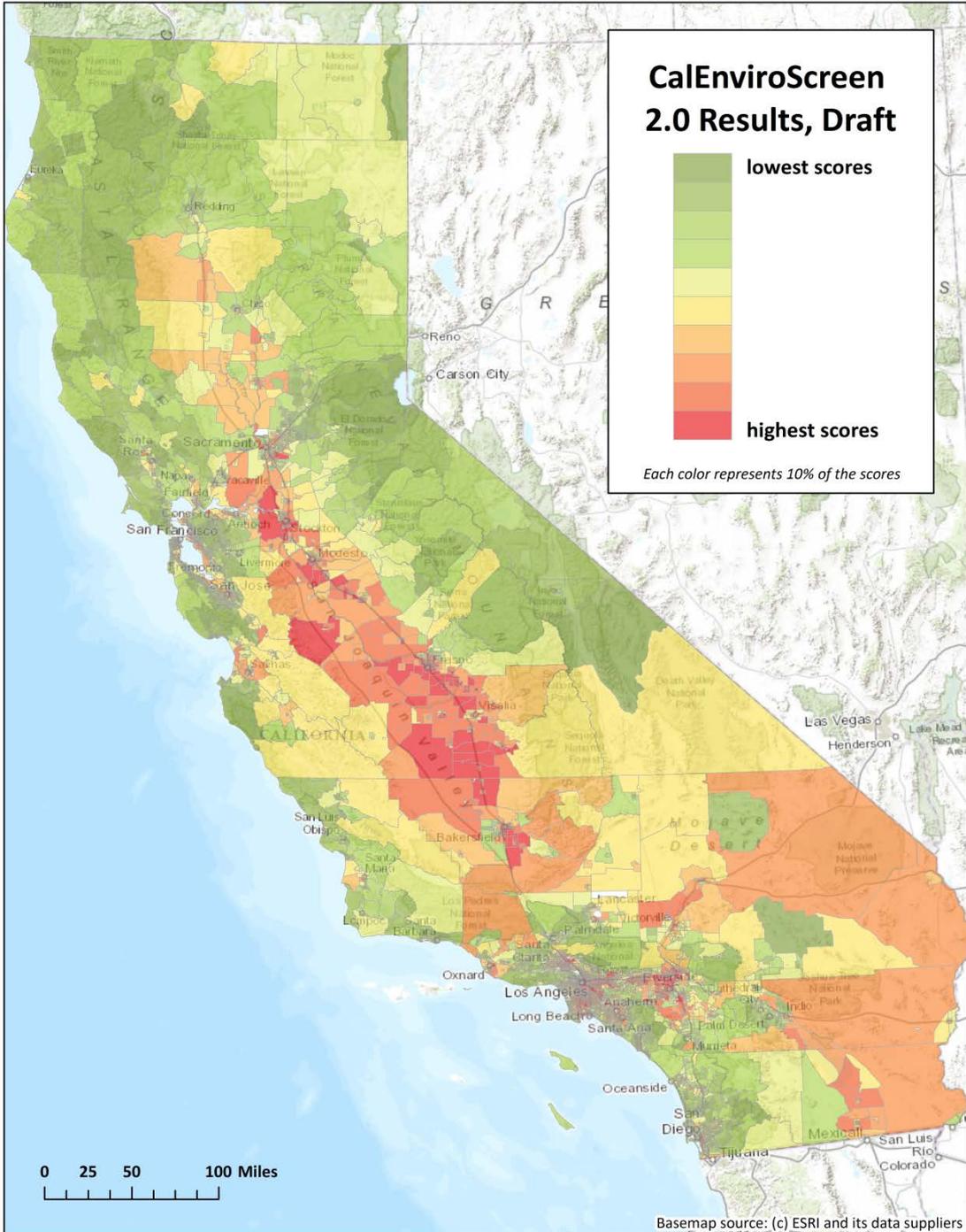


CALENVIROSCREEN 2.0 RESULTS

CalEnviroScreen 2.0 Results, Draft



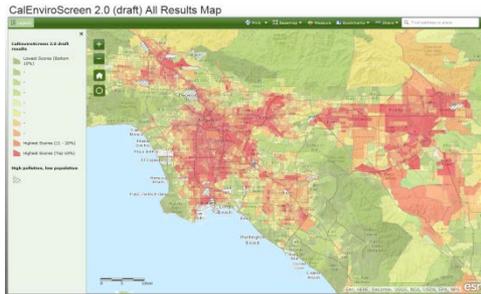
Each color represents 10% of the scores



CALENVIROSCREEN VERSION 2.0, DRAFT RESULTS

DRAFT CalEnviroScreen 2.0 RESULTS

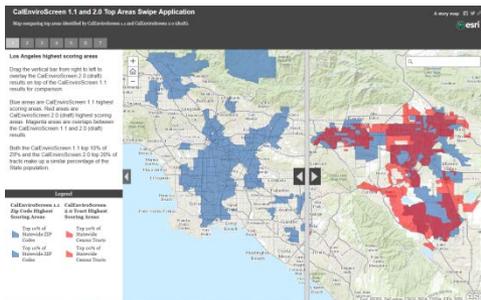
[AVAILABLE AT WWW.OEHHA.CA.GOV/EJ/CES2](http://WWW.OEHHA.CA.GOV/EJ/CES2)



All CalEnviroScreen 2.0 Scores by Census Tract



Highest Scoring 10% and 20% CalEnviroScreen 2.0 Census Tracts



Overlay of CalEnviroScreen 2.0 (Top 20%) with CalEnviroScreen 1.1 (Top 10%)



CALENVIROSCREEN 2.0

Q&A

To submit a question during the webinar, press the 'Q & A' button at the top of your screen and type your question in the box.

Press Enter or 'Ask' to submit your question.

SUBMIT QUESTIONS VIA LIVE-MEETING WEBINAR:

To submit a question during the webinar, press the 'Q & A' button at the top of your screen and type your question in the box. Press Enter or 'Ask' to submit your question.

SUBMIT COMMENTS ON CALENVIROSCREEN 2.0

By e-mail:

CalEnviroScreen@oehha.ca.gov

By mail:

CalEnviroScreen
c/o John Faust, Chief, CARS
Office of Environmental Health Hazard Assessment
1515 Clay Street, Suite 1600
Oakland, CA 94612