



Identifying Impacted Communities: Draft Revised Mapping Method

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Bay Area Air Quality Management District

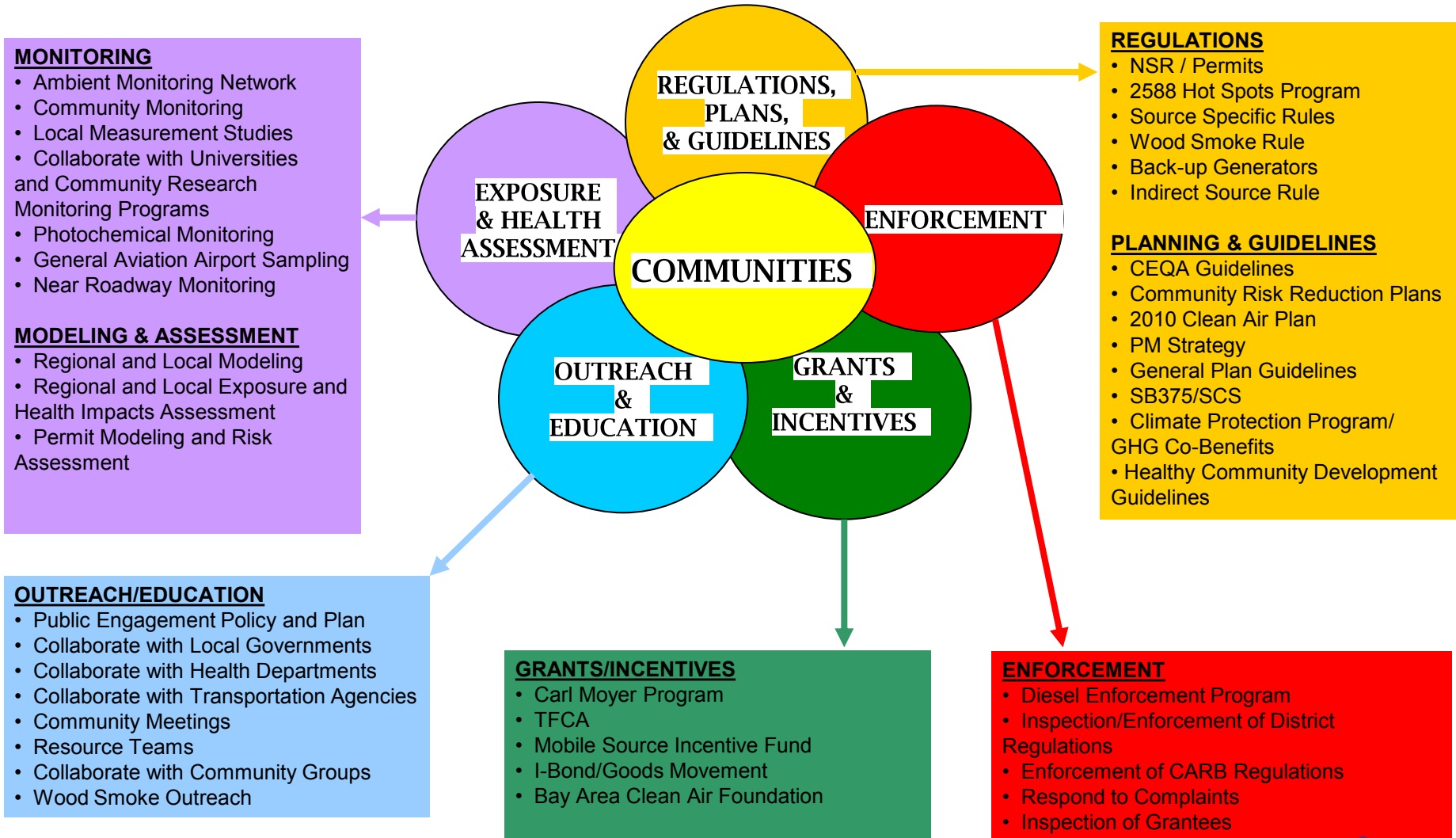
CARE Task Force Meeting

October 16, 2012

Overview

- Background and Review
 - Why update current maps?
 - June meeting review and discussion
- Draft Updated Mapping Method
- Assumptions and Issues
- Questions
- Next steps

Clean Air Communities Initiative



Current Mapping

Goal:

- Focus actions where most needed
 - High exposures, sensitive populations

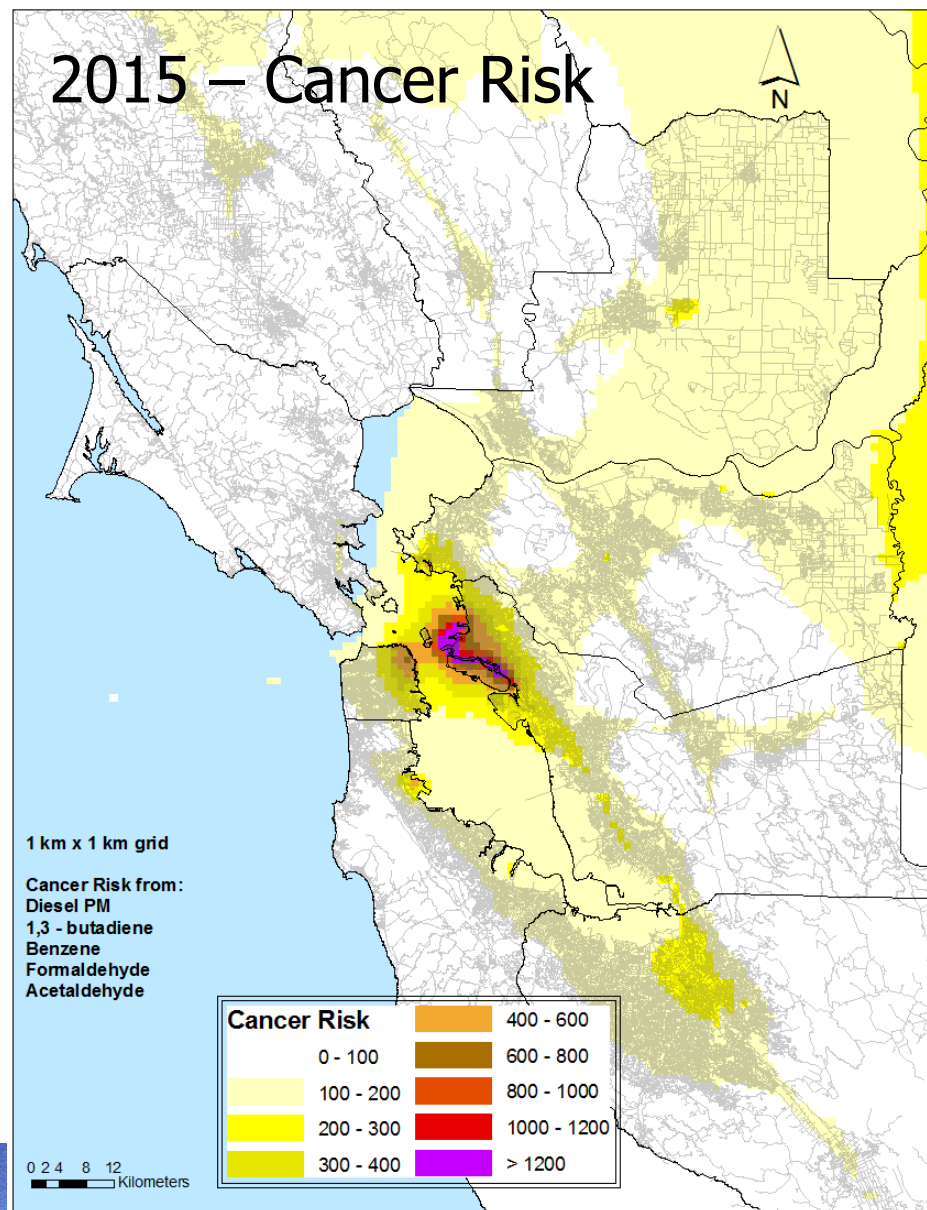
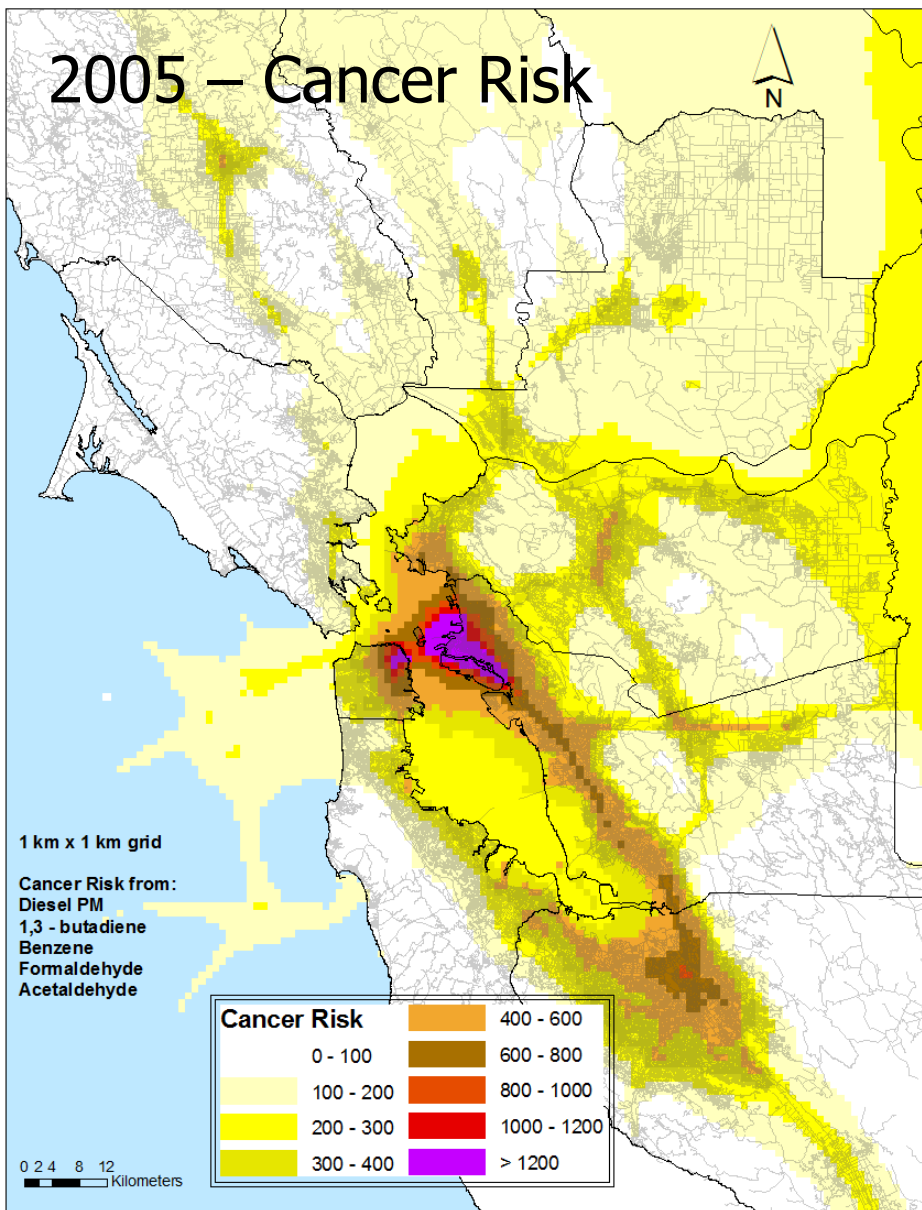
Method:

- Areas with high exposures to toxic air contaminants
 - Youth, seniors
- Areas with high emissions of toxic air contaminants
- Areas with low family Income

Why Update Current Maps?

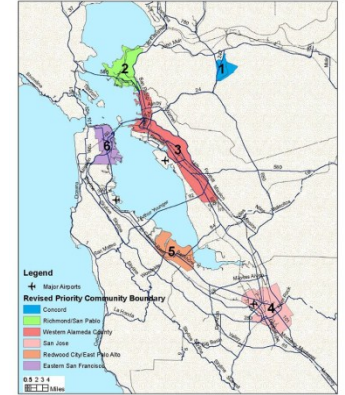
- Use latest data
 - 2010 US Census
 - 2015 toxic emissions and modeling
- Consider additional air pollutants
 - In addition to toxic compounds: fine particles and ozone
- Consider health outcome data
- Consider new methods developed since first maps

Example: Estimated Toxic Air Contaminants Decreasing



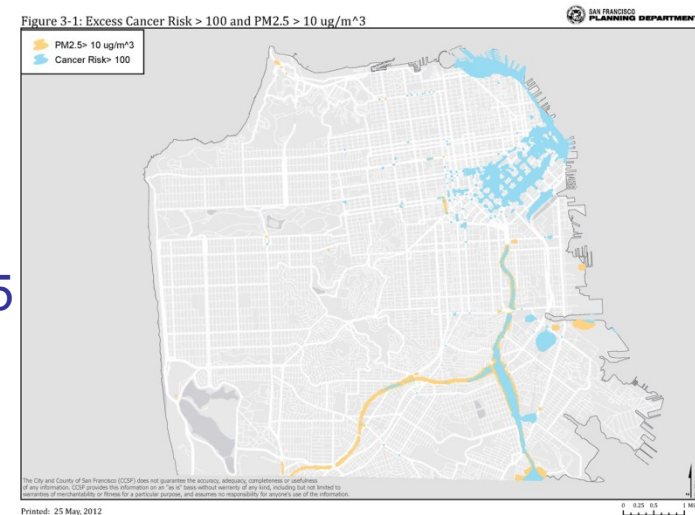
June Meeting: Review

- Air District: current methods & maps
- Dr. Alexeeff (OEHHA): screening method under development at CalEPA estimates cumulative impact as a combination of pollution burden and population characteristics



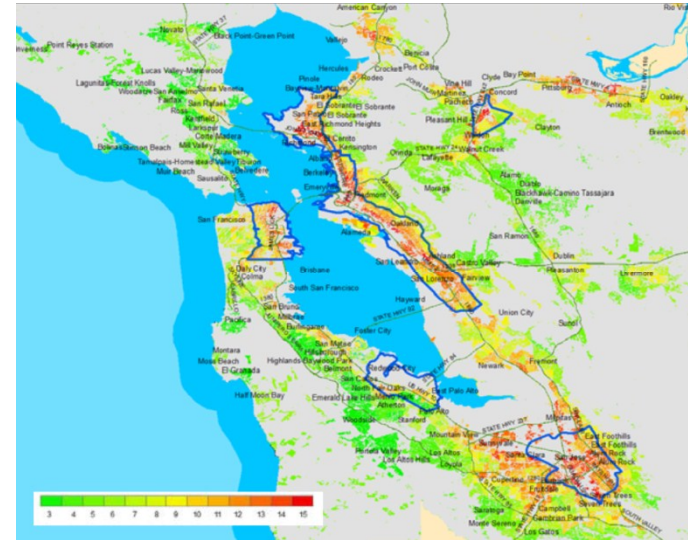
June Meeting: Review

- Dr. Morello-Frosch (UC Berkeley):
Screening method (EJSM): Cumulative Impact Score = Hazard Proximity and Sensitive Land Use Score (1-5) + Health Risk and Exposure Score (1-5) + Social and Health Vulnerability Score (1-5)
- Dr. Bhatia (SFDPH): SF Community Risk Reduction Plan
- Areas above thresholds for $PM_{2.5}$ and cancer risk
- Dispersion modeling of local pollution sources (SFDPH, Air District)



June Meeting: Discussion & Comments

- Several commented that Air District method and EJSM identified similar areas
- Several cautioned not to spend too much time on analysis details—focus on mitigation!
- Some favored screening methods that included metrics of race and linguistic isolation
- Some urged caution in applying screening methods with metrics of potential exposure, e.g., proximity to industrial source vs. emissions or exposure



Goals of Proposed Method

- Focus actions where most needed
 - High exposures, vulnerable populations
 - Target emissions causing high exposures
- Consider multiple air pollutants
 - Set criteria for determining relative importance of different pollutant exposures
- Set clear criteria for identifying vulnerable populations
 - Use records of adverse health outcomes
- Use most accurate, recent data for Bay Area

Draft Proposed Method Outline

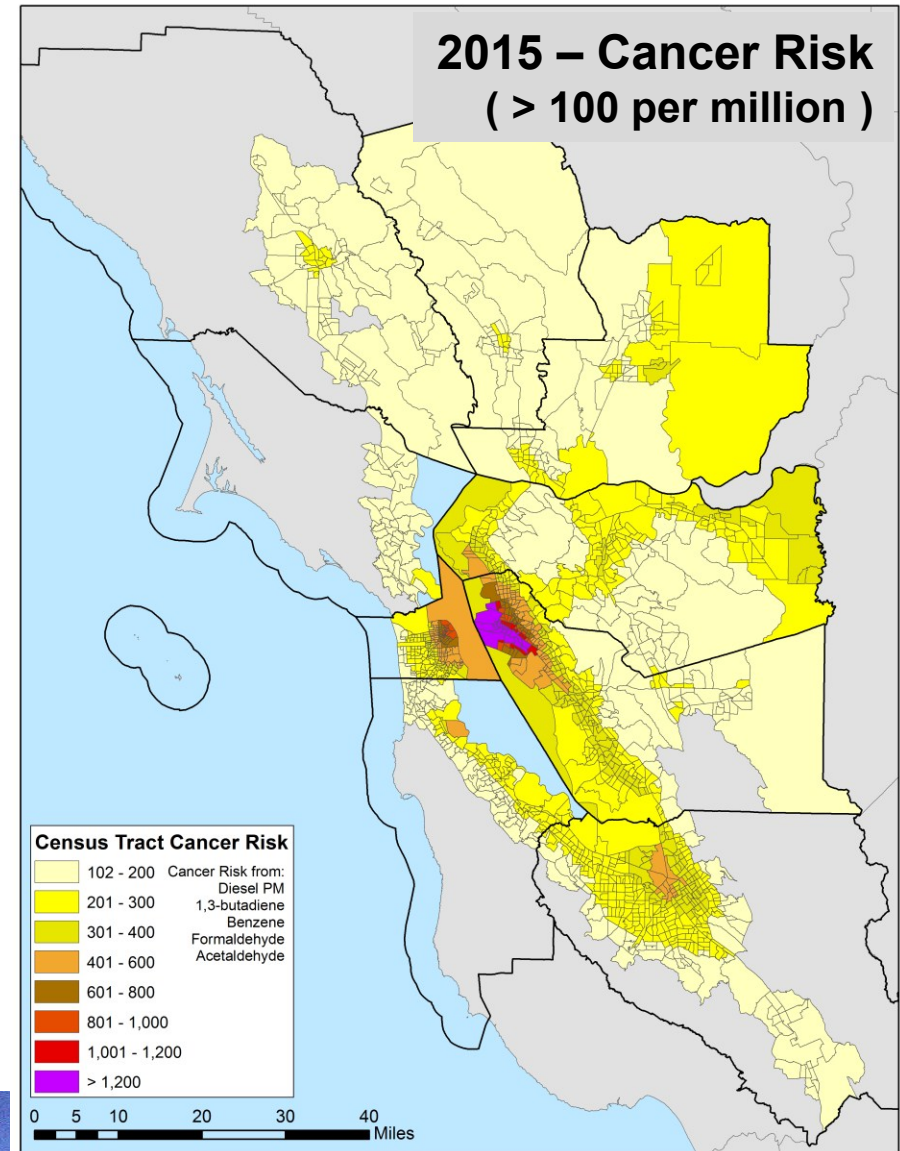
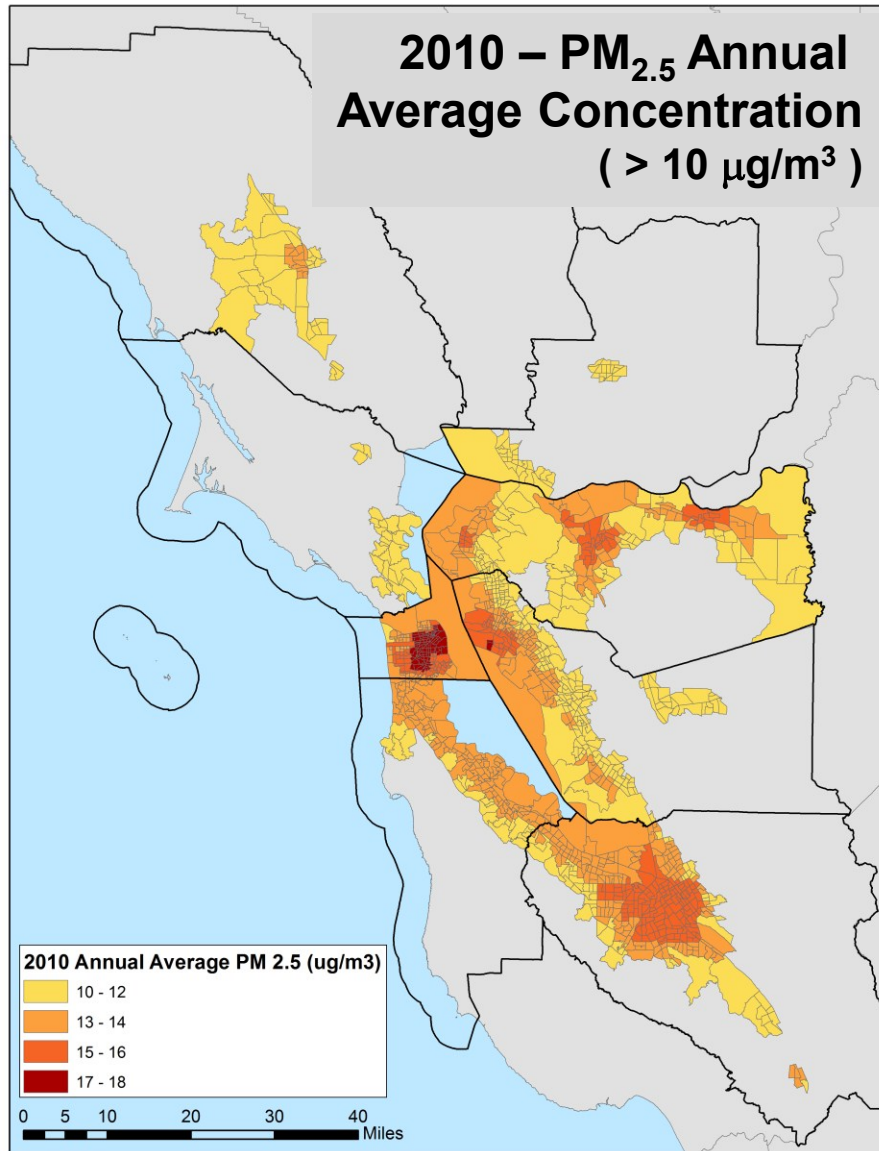
1) Identify where air pollution levels are high

Use recent, regional air quality modeling to map pollutant concentrations:

- toxic air contaminants
- fine PM
- Ozone

Result: Model-estimated pollutant concentrations (can map to census tracts)

Example: Regional Air Pollution Modeling Mapped to 2010 Census Tracts



Draft Proposed Method Outline

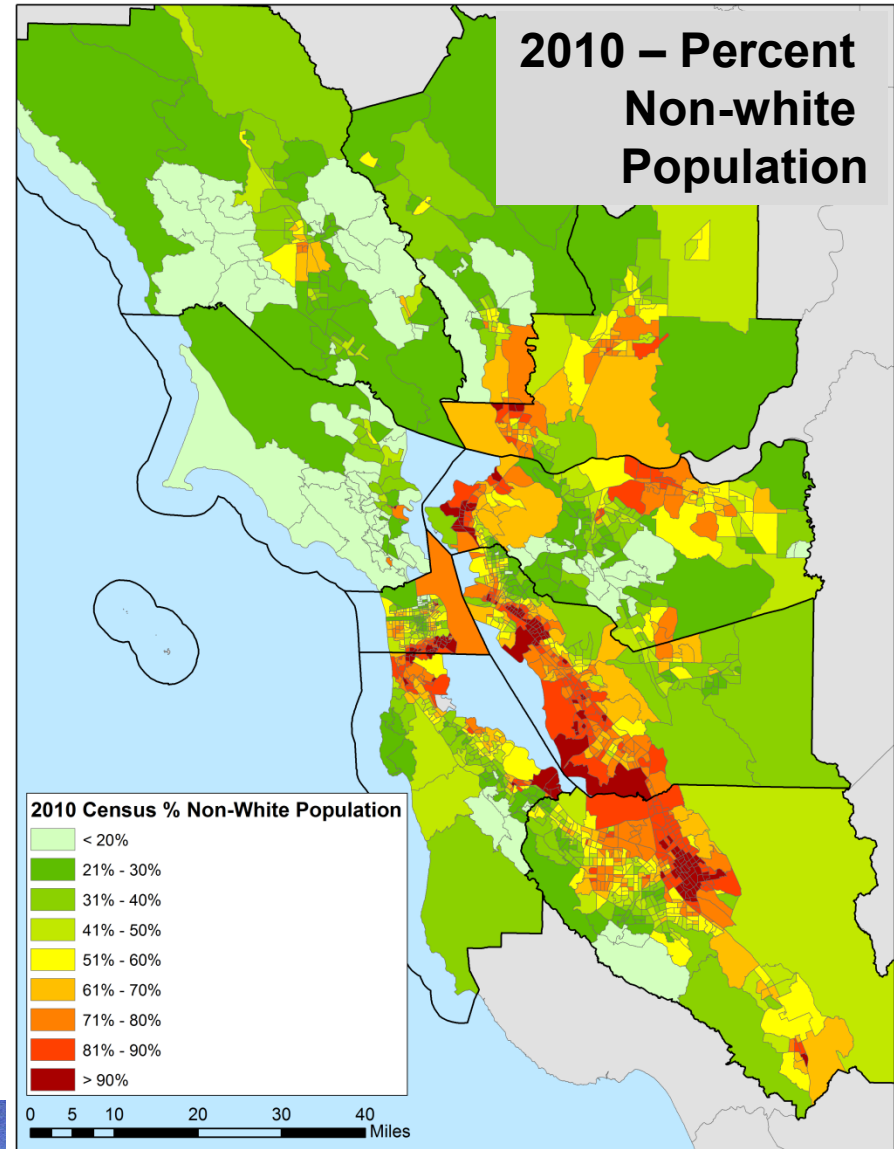
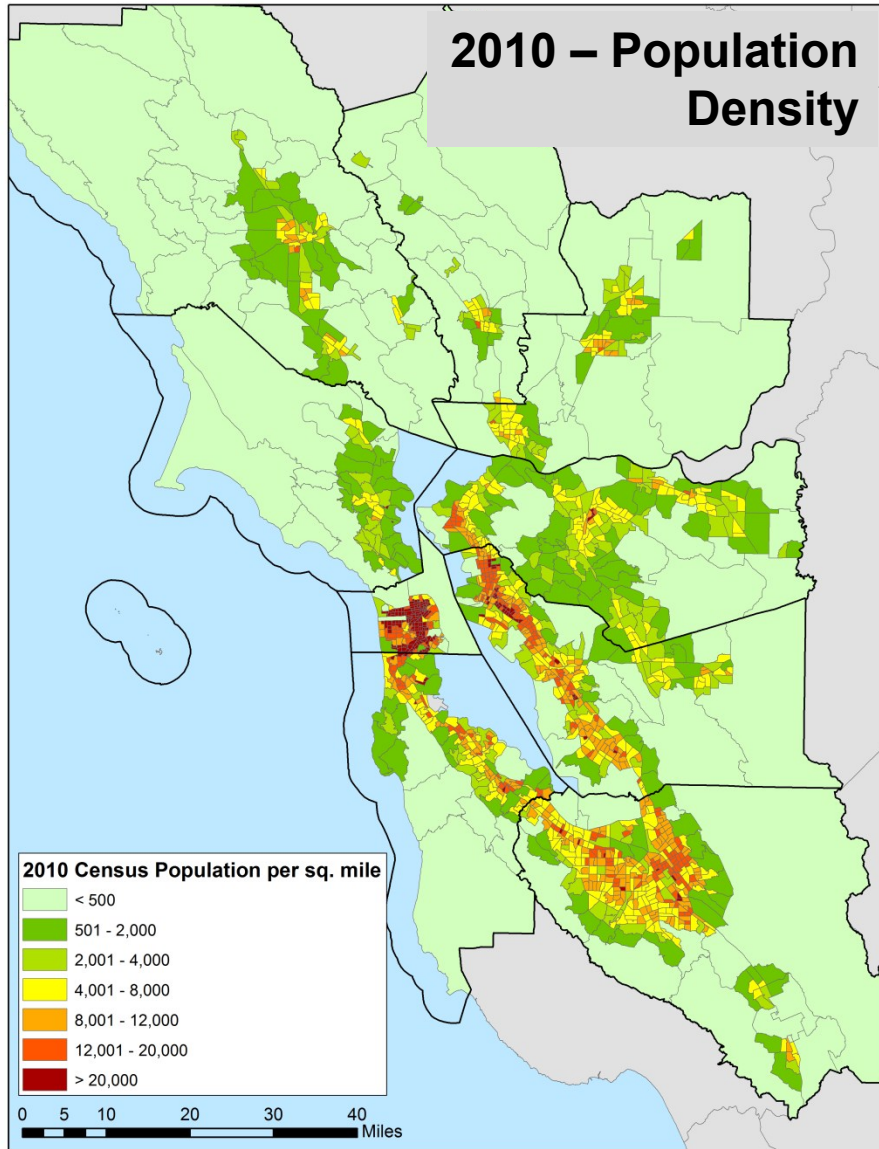
2) Identify where exposures are high and set relative importance of exposures to different pollutant types

Use population from 2010 US Census

- exposure = concentration x population
- estimate health impacts for different pollutant exposures
- use health costs to set relative importance—
build on Air District's Multi-Pollutant Method

Result: health cost estimates on census tracts

Example: 2010 US Census Demographic Information



Draft Proposed Method Outline

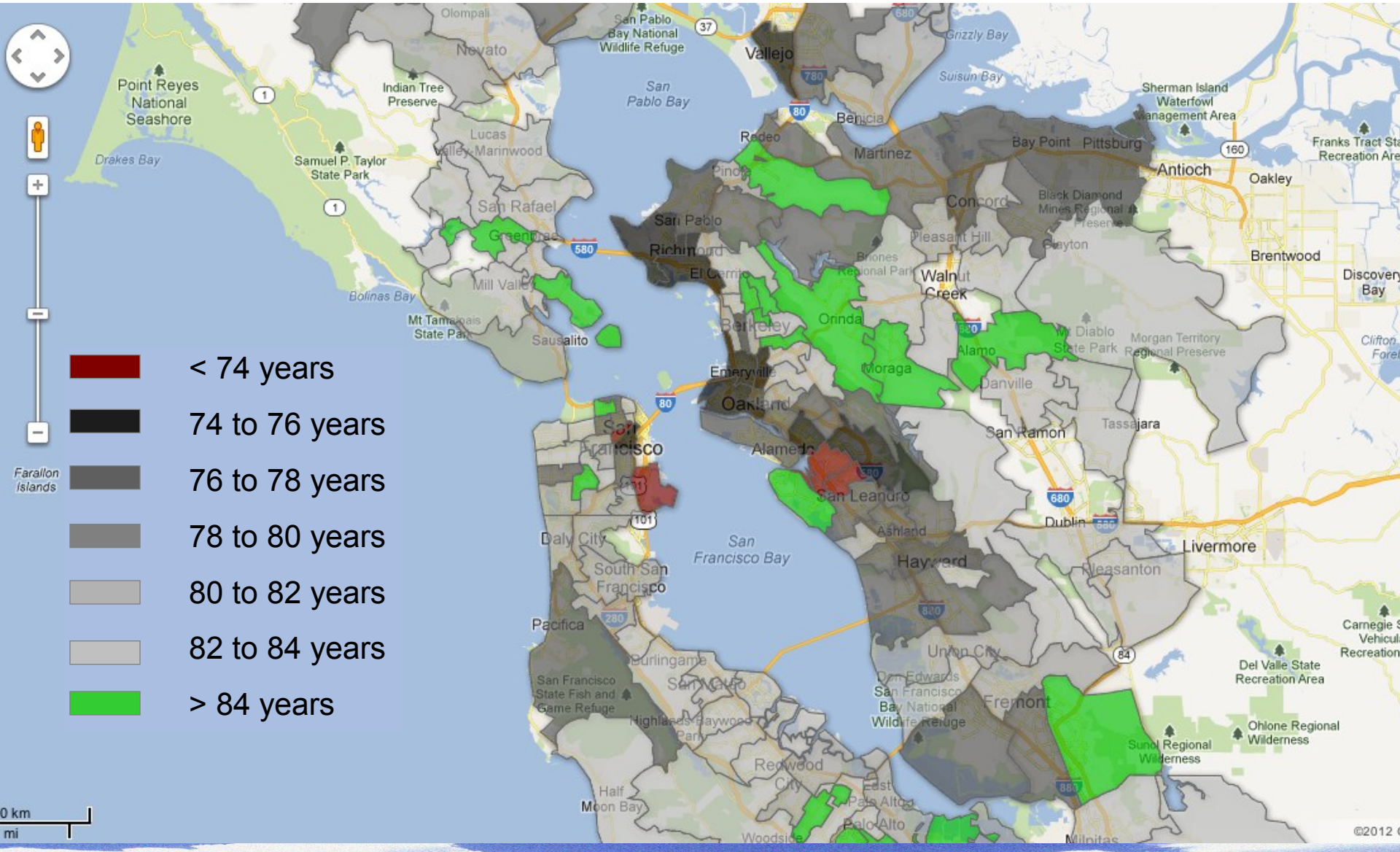
3) Identify vulnerable populations

Use recent health outcome records for diseases aggravated by air pollution

- death rates
- ER visits
- hospital admission rates
- estimate costs of adverse health outcomes

Result: health cost estimates by census tracts or ZIP codes

Example: Life Expectancy (2004-2006) by ZIP Code



Draft Proposed Method

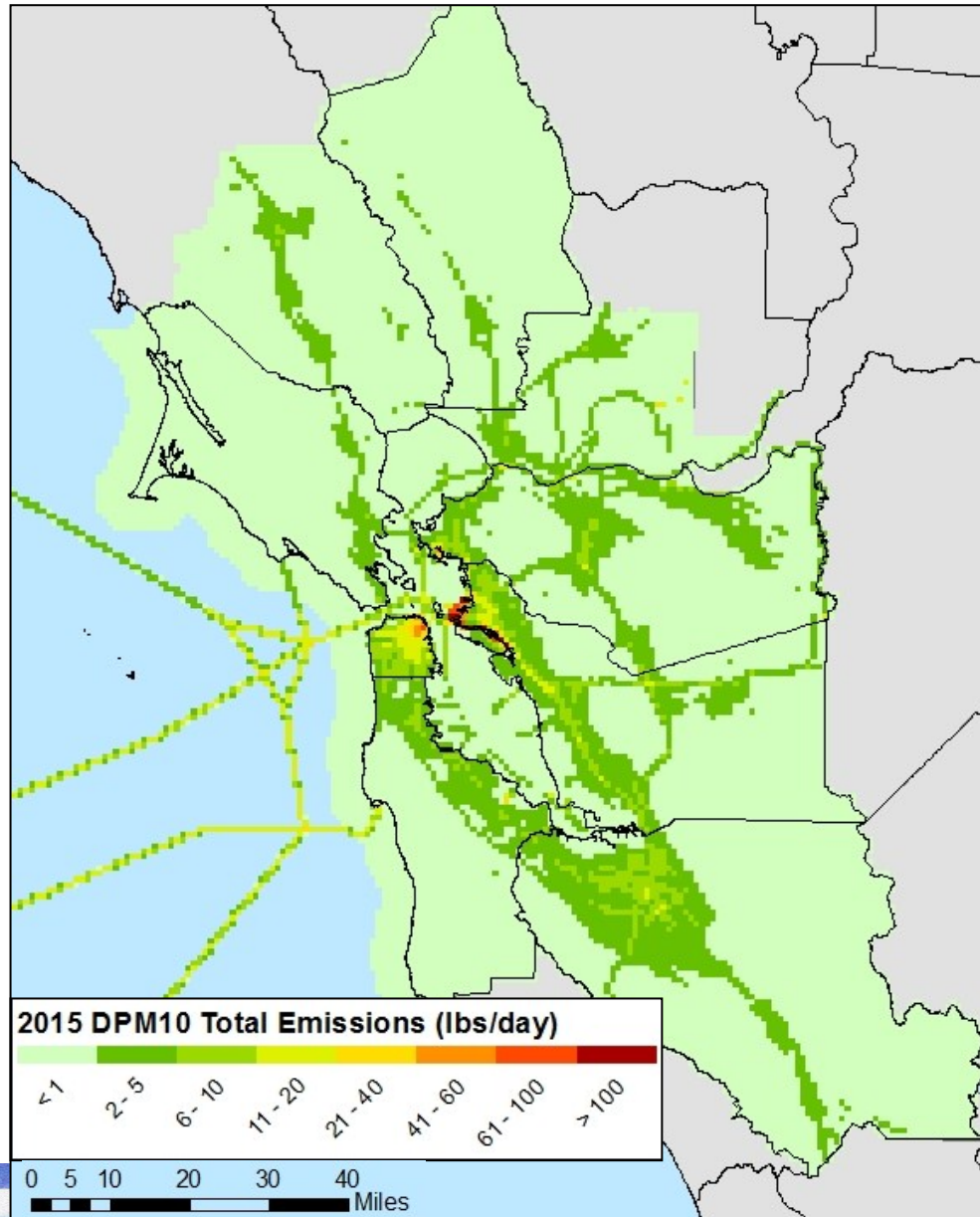
4) Identify where emissions are high

Use regional modeling emissions inputs to map

- direct emissions (TAC, primary PM)
- precursor emissions (VOC, NO_x, ammonia)
- assign importance of different pollutant emissions based on estimated relative contribution to health costs—as in Multi-Pollutant Plan

**Result: Emissions with health-cost weights
(can map to census tracts)**

Example: Diesel PM Emissions (2015)



Draft Proposed Method

5) Bring it all together

Identify areas with

- high costs from estimated health impacts from air pollution OR
- high costs from recorded diseases aggravated by air pollution
- NEAR areas with high direct and precursor emissions

Draw boundaries along major roadways around these areas

Result: Updated impacted area boundaries

Proposed Method: Advantages

- Uses detailed, up-to-date information for Bay Area air pollution concentrations and population
- Uses costs of health impacts to combine different pollutants
 - Builds on Air District's Multi-pollutant Plan
- Considers estimated and observed health impacts
 - Observed health impacts will reflect socio-economic vulnerabilities
- Explicitly estimates impacts from air pollution and explicitly assesses population vulnerabilities

Proposed Method: Issues

- Estimated health impacts assume “backyard” exposures
 - Assumes population is static, outside residence
 - Doesn’t account well for local microenvironments, such as indoor or near-roadway exposures
- Most health records are only available at the ZIP code level
- Obtaining health records is a slow process
- Difficult to identify emission source areas for ozone and secondary PM

Next Steps

- Develop and share maps using updated method; seek input (Dec 2012/Jan 2013)
- Finalize updated maps early 2013