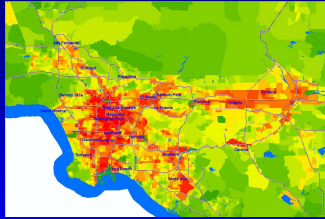


ARB Research Project Overview EJ Screening Method



Climate Action Team
Public Health Workgroup

June 18, 2009

Air Resources Board



California Environmental Protection Agency

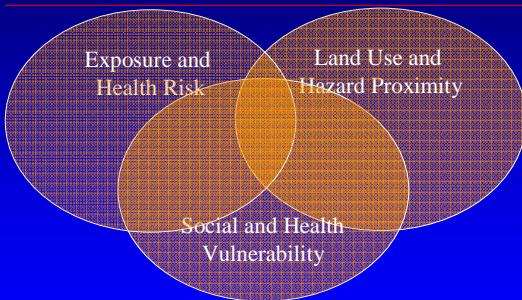
Screening Method

- Research contract: To provide an approach for integrating the cumulative impact and risk from air pollution with measures of socioeconomic vulnerability
- Review Process
 - Consultation with scientific Peer Review Committee (PRC)
 - Presentation to PRC on December 18, 2009
 - PRC Comments
 - Researchers made reasonable choices
 - Some double counting, but unavoidable
 - Add sensitivity analysis
 - Presentations to environmental justice organizations, research conferences, and government agencies



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Overview



3

Scoring

- Three maps equally scored
- Each map scored 1 5
- Land Use and Hazard Proximity
 - More complex scoring methodology
- Combined map scored 3 15



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Elements of Screening Method

- Exposure and Health Risk
 - State and federal data
 - Modeling from emissions inventories
- Social and Health Vulnerability
 - Based on epidemiological literature
 - EJ literature on community vulnerability
- Land Use and Hazard Proximity
 - ARB land use guidelines



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Exposure and Health Risk

- Fine Particulate Matter
 - 2004 2006 annual average
- Ozone 2004 2006 annual exceedances
- Cancer Risk
 - ARB modeled estimate
 - Mobile and stationary sources for 2001
- Respiratory Hazard
 - Air toxics for 1999
 - National Air Toxics Assessment
- Toxic concentration based hazard scores
 - Toxic Release Inventory facilities for 2005



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Exposure & Health Risk Overview

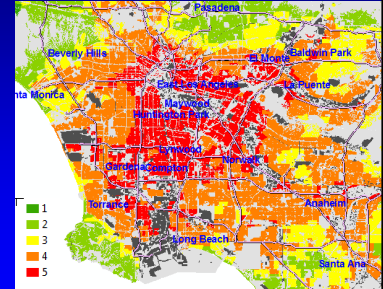
- **Data layer selection**
 - Monitored exposure data
 - Modeled cancer and non cancer risk
- **Advantages**
 - Reflects actual exposures
- **Limitations**
 - May not detect local hotspots



7

Exposure and Health Risk Map

- Each exposure and health risk parameter scored 1 to 5
- Scores added together and normalized to scale from 1 to 5



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Social and Health Vulnerability

- Race/Ethnicity
- Poverty
- Homeownership
- Educational attainment
- Age of residents children, seniors
- Linguistic isolation
 - % households where English not spoken well
- Voter turnout
- Birth outcomes



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Social and Health Vulnerability Overview

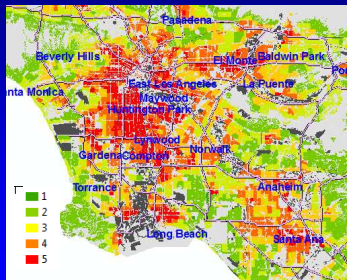
- **Data layer selection**
 - Demographic and socioeconomic data
 - Social determinants of health
- **Advantages**
 - Indicators of socioeconomic status
- **Limitations**
 - Proxy variables for health vulnerability



10

Social and Health Vulnerability Map

- Each vulnerability parameter scored 1 to 5
- Scores added together and normalized to scale from 1 to 5



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Land Use and Hazard Proximity

- Residential land use
- Locations of sensitive land uses
 - schools, day care centers, playgrounds, urban parks, and health care facilities
- Hazardous land use
 - Railroads, airports, ports, petroleum refineries, and intermodal facilities
- Proximity to potential air pollution hazards
 - CHAPIS facilities
 - chrome plating facilities
 - Hazardous waste treatment, storage and disposal facilities



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Land Use & Hazard Proximity Overview

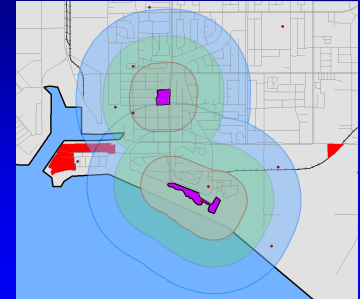
- **Data layer selection:**
 - Identify sensitive receptors
 - Identify potential health hazards
- **Advantages:**
 - Consistent with ARB Land Use Handbook
 - Indicative of hotspots and potential exposure
- **Limitations:**
 - May not reflect actual exposure or most toxic exposure



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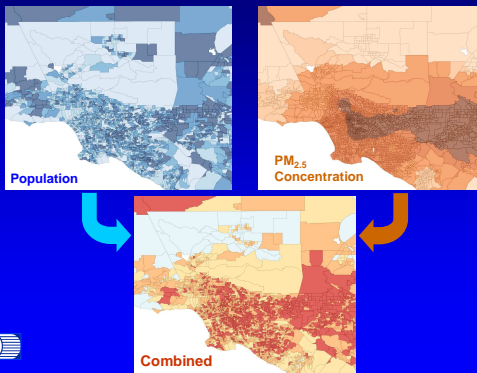
Land Use and Hazard Proximity Map

- Buffers around residents and sensitive land uses
- Score based upon facilities inside buffer
 - 1000 feet 1
 - 2000 feet 0.5
 - 3000 feet 0.1



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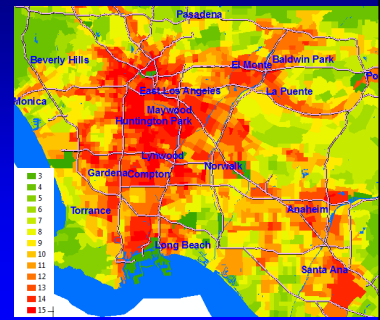
Example Map



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Combined Map

- Exposure and Health Risk
- Land use and Hazard Proximity
- Social and Health Vulnerability



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Conclusion

- This research project attempts to identify where actual and potential exposure to pollutants overlaps with social and health vulnerability
- Double counting is an issue
- It represents a snapshot in time
- Near roadway exposure not included
- Basic GIS method can be adapted to program needs



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