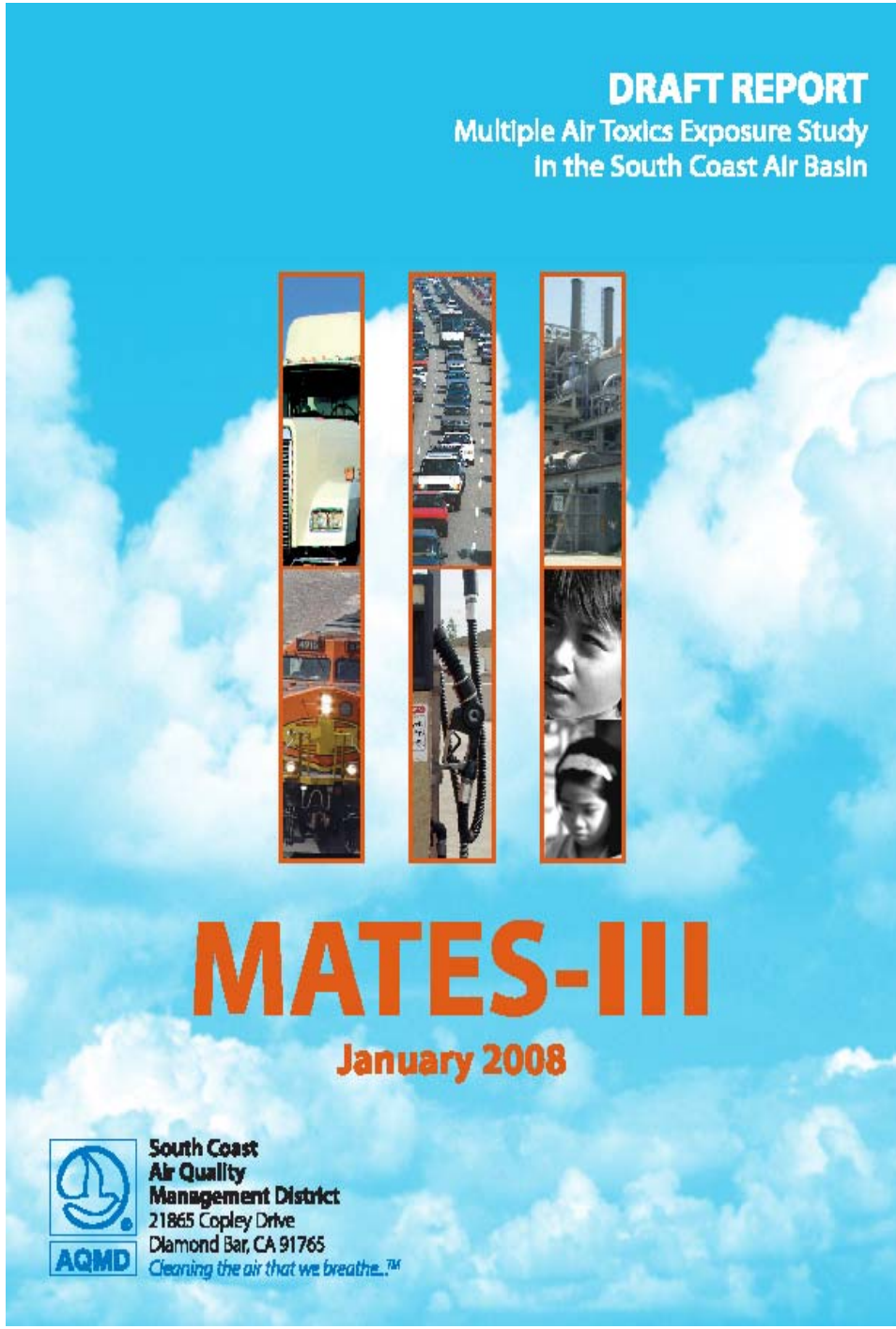
Multiple Air Toxics Exposure Study (MATES III)

Orange County Transportation Authority

Board of Directors Meeting

March 10, 2008



Background

- Multiple Air Toxics Exposure Study (MATES I): 1987
- MATES II: 1998-99
- MATES III: 2004-2006
- Environmental Justice Initiatives
- Focus on toxics exposure and risk
  - PM mortality not included

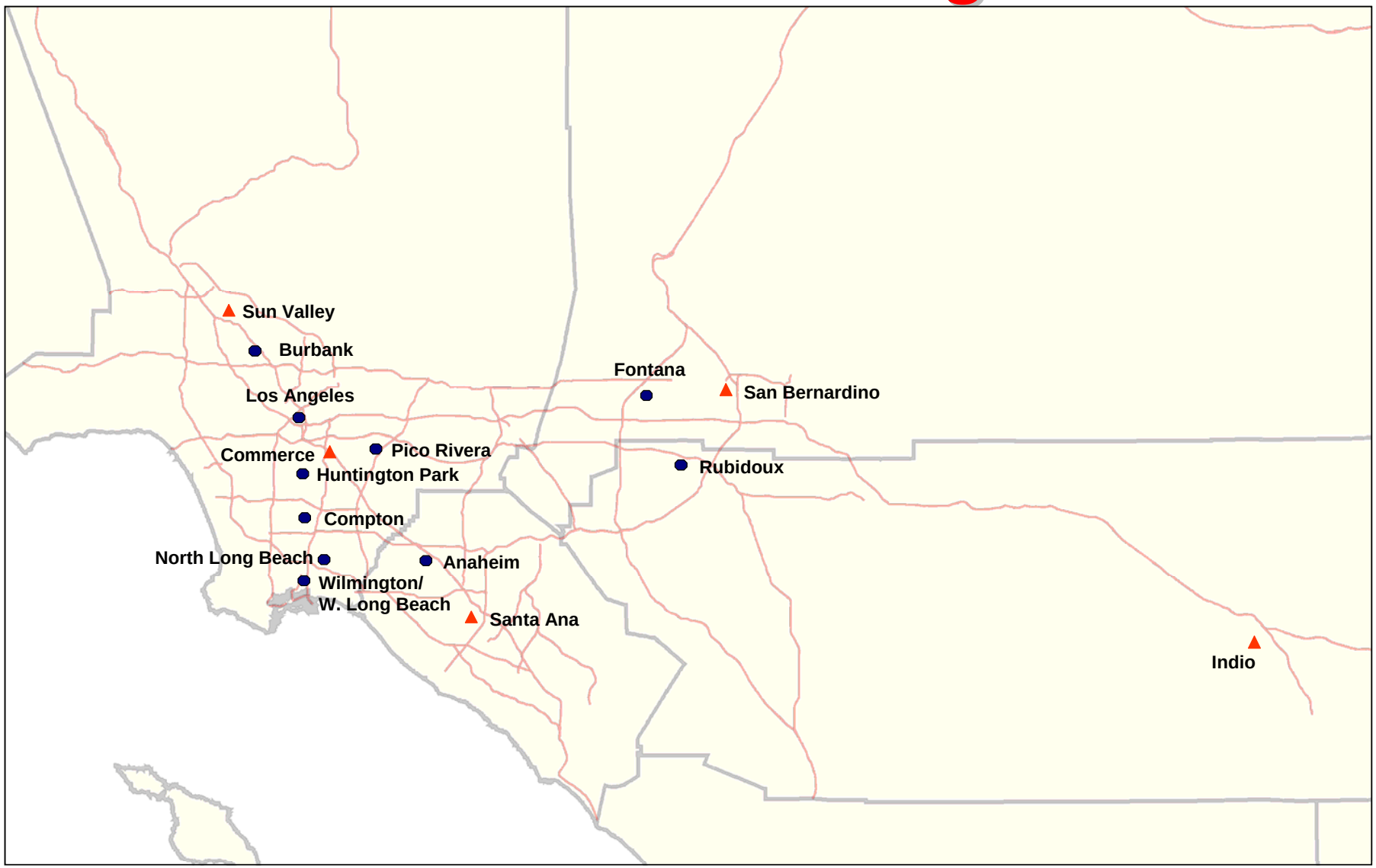
Key Components

- Monitoring
- Emissions inventory
- Modeling
- Technical Advisory Group input on study plan

Enhancements to MATES III

- Monitoring done every 3 days
- Data collected over 2 years: April ‘04 – March ‘06
- Added $PM_{2.5}$ samples
- Added naphthalene, PAHs, PM organic tracers
- Updated method (CMB) to estimate diesel PM
- Latest 2007 AQMP inventory used
- Improved spatial allocation of truck emissions
- Updated modeling platform consistent with AQMP

MATES III Monitoring Sites

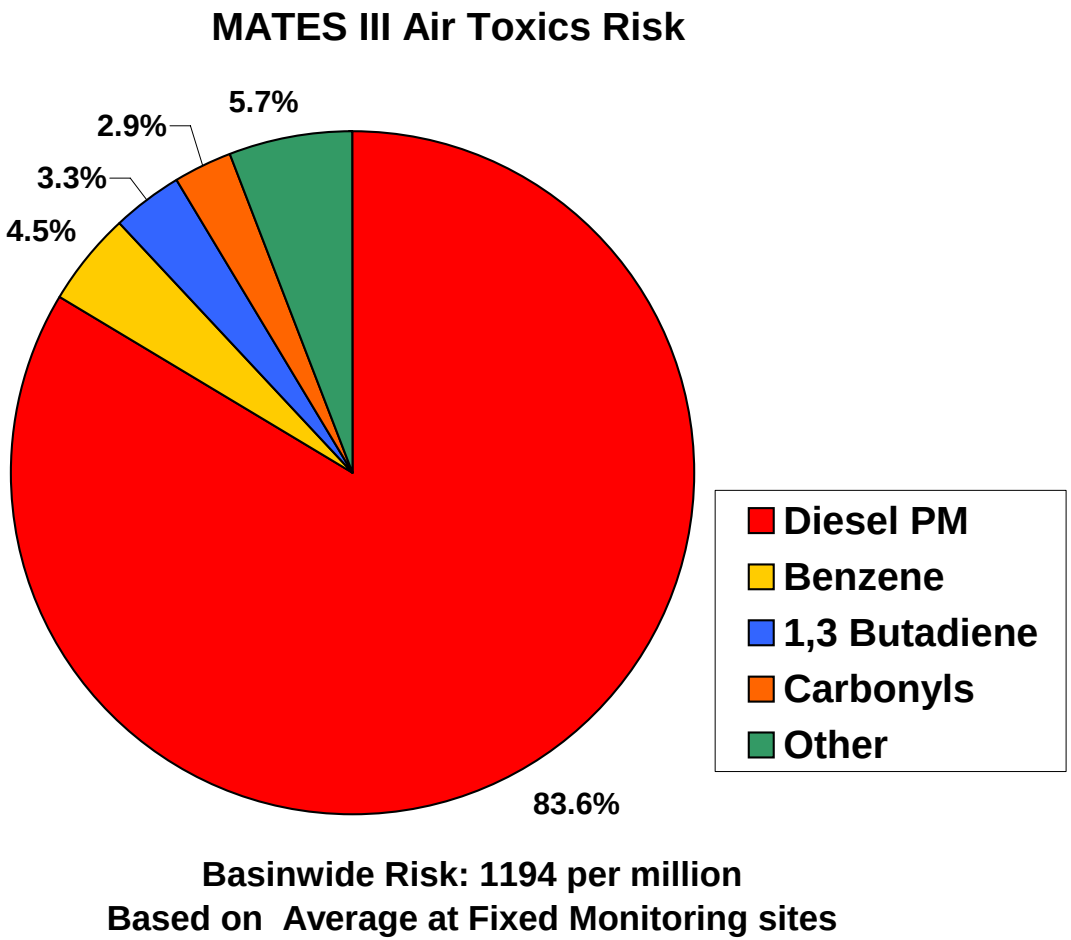


Substances Measured

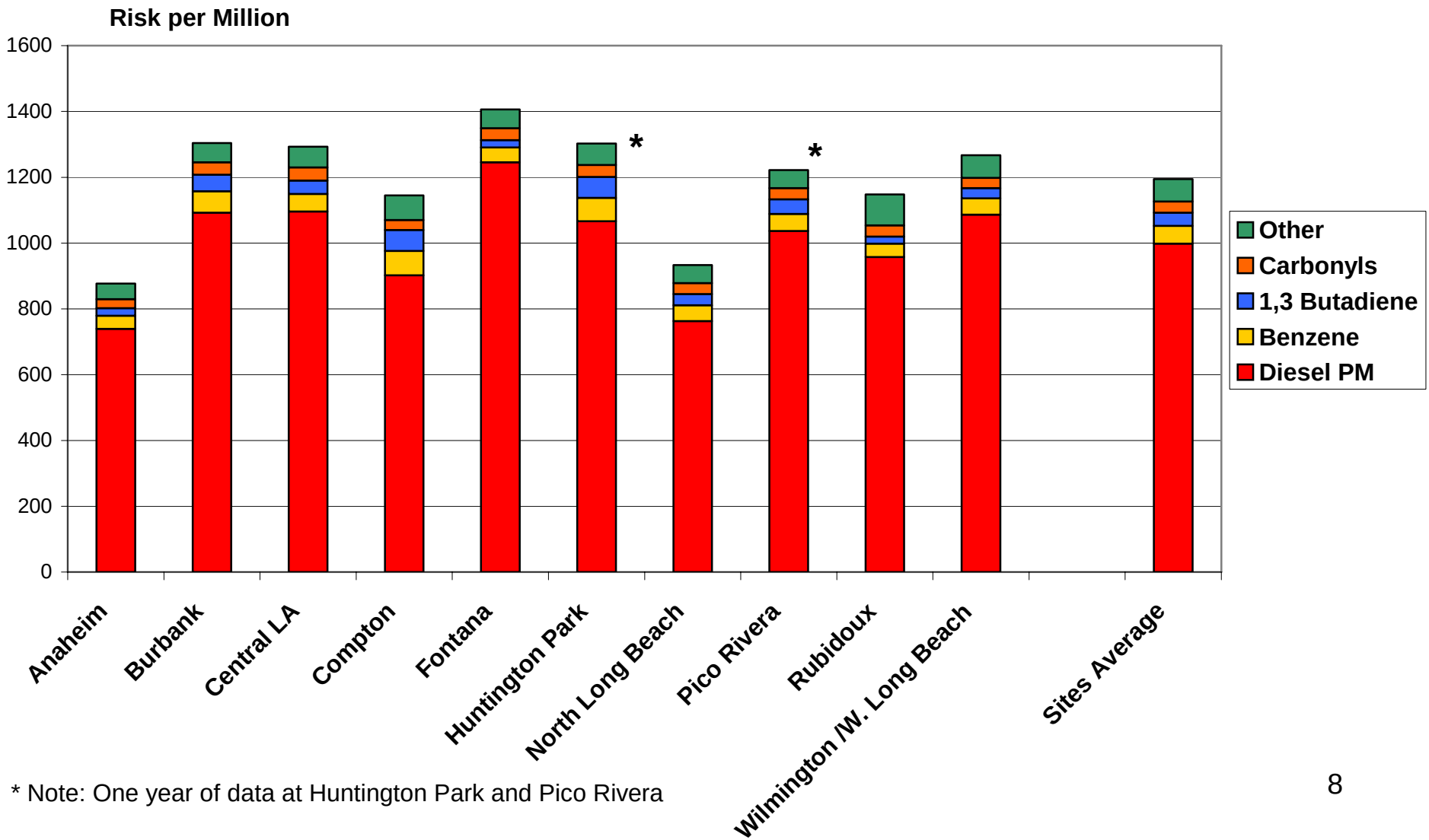
Benzene	1,3-Butadiene	Carbon Tetrachloride
Chloroform	Chloromethane	Dichlorobenzene
Methylene Chloride	Perchloroethylene	Dichloroethane
Ethylbenzene	Toluene	Trichloroethylene
Xylene	Styrene	Vinyl Chloride
Acetaldehyde	Formaldehyde	Acetone
Arsenic	Beryllium	Cadmium
Chromium^{+6}	Copper	Lead
Manganese	Nickel	Zinc
Elemental Carbon	Naphthalene	PAHs
Diesel PM	PM_{10}	$PM_{2.5}$

MATES III Monitoring

- General trend is down for air toxics levels
- Estimated basin wide lifetime risk 1,200 per million
- Mobile source toxics account for 94% of risk
- Diesel accounts for 84% of air toxics risk
- Non-diesel risk lower by 50%



Air Toxics Cancer Risk by Site



* Note: One year of data at Huntington Park and Pico Rivera

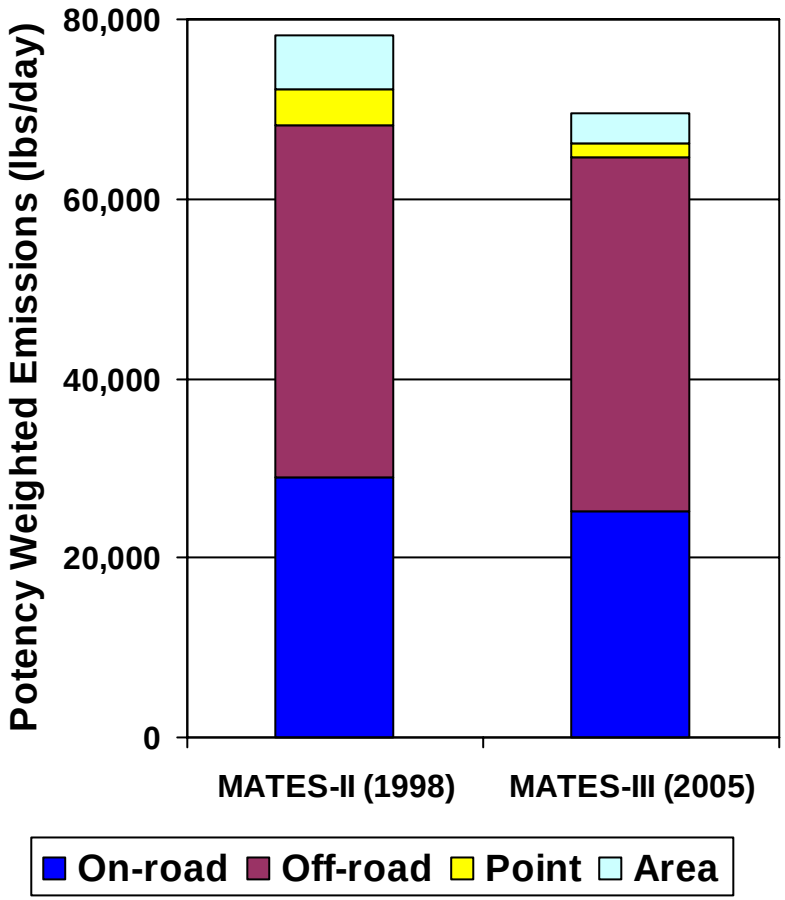
Comparison of Diesel PM Estimation Methods

Estimation Method	**MATES III** **Diesel PM ug/m^3**	**Average Basin Wide Air Toxics Cancer Risk (per million)**
MATES II Method: PM_{10} EC x 1.04	2.16	851
2005 Inventory Method: $PM_{2.5}$ EC x 1.72	3.1	1133
CMB Method	3.20 – 3.49	1194

MATES III Emissions Inventory

- Estimated emissions of toxics for 2005
- Mobile sources dominate air toxics emissions
  - Account for 93% of potency weighted emissions
  - Diesel PM contributes 87% of potency weighted emissions of carcinogens
- Using updated methodology to back cast to 1998 - emissions show a decrease in potency weighted toxics emissions of 15%

Carcinogenic Emissions
(MATES-II vs. MATES-III)

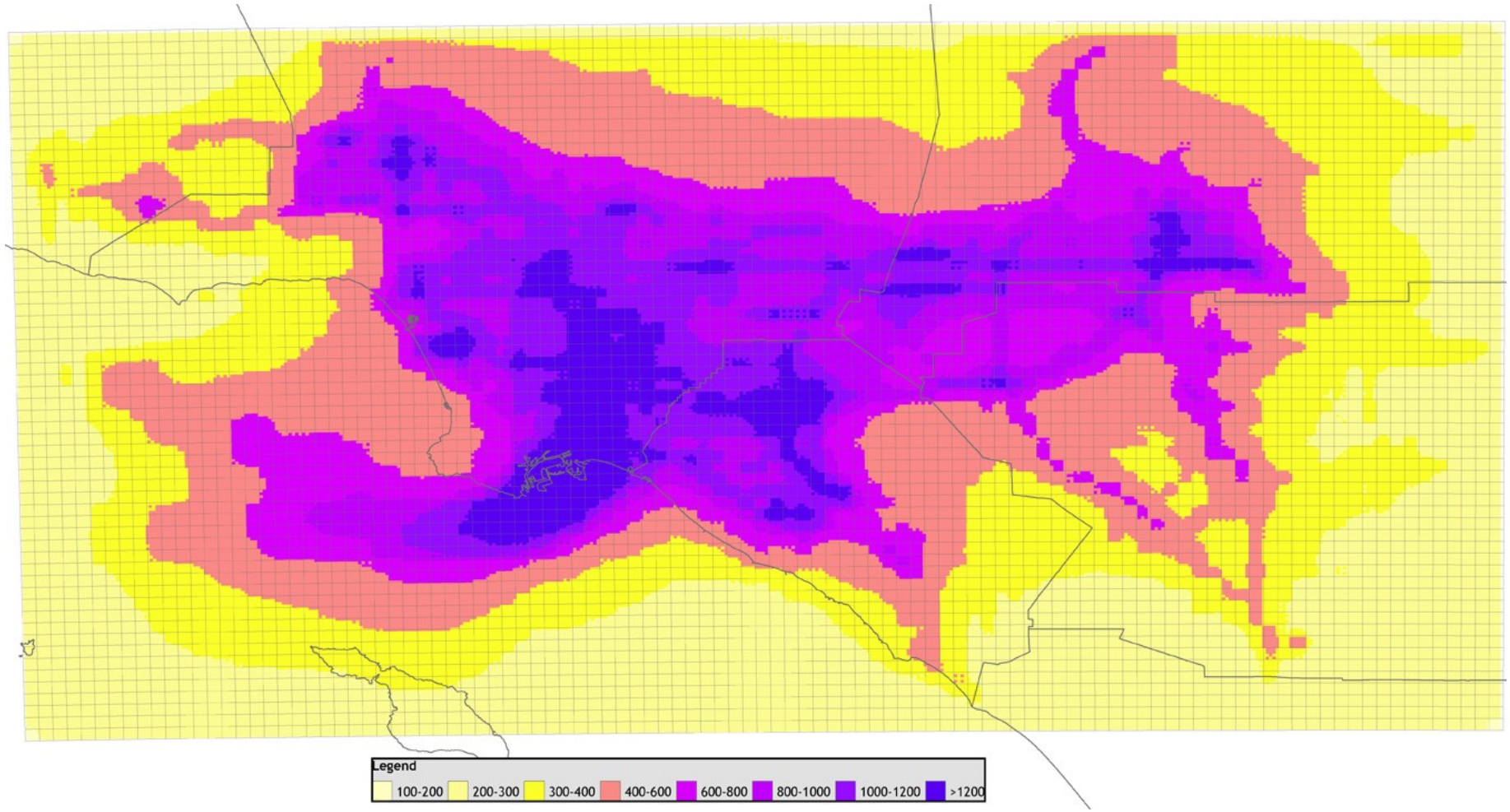


Source Category	Percent Change
On-road	13% decrease
Off-road	1% increase
Point	65% decrease
Area	43% decrease

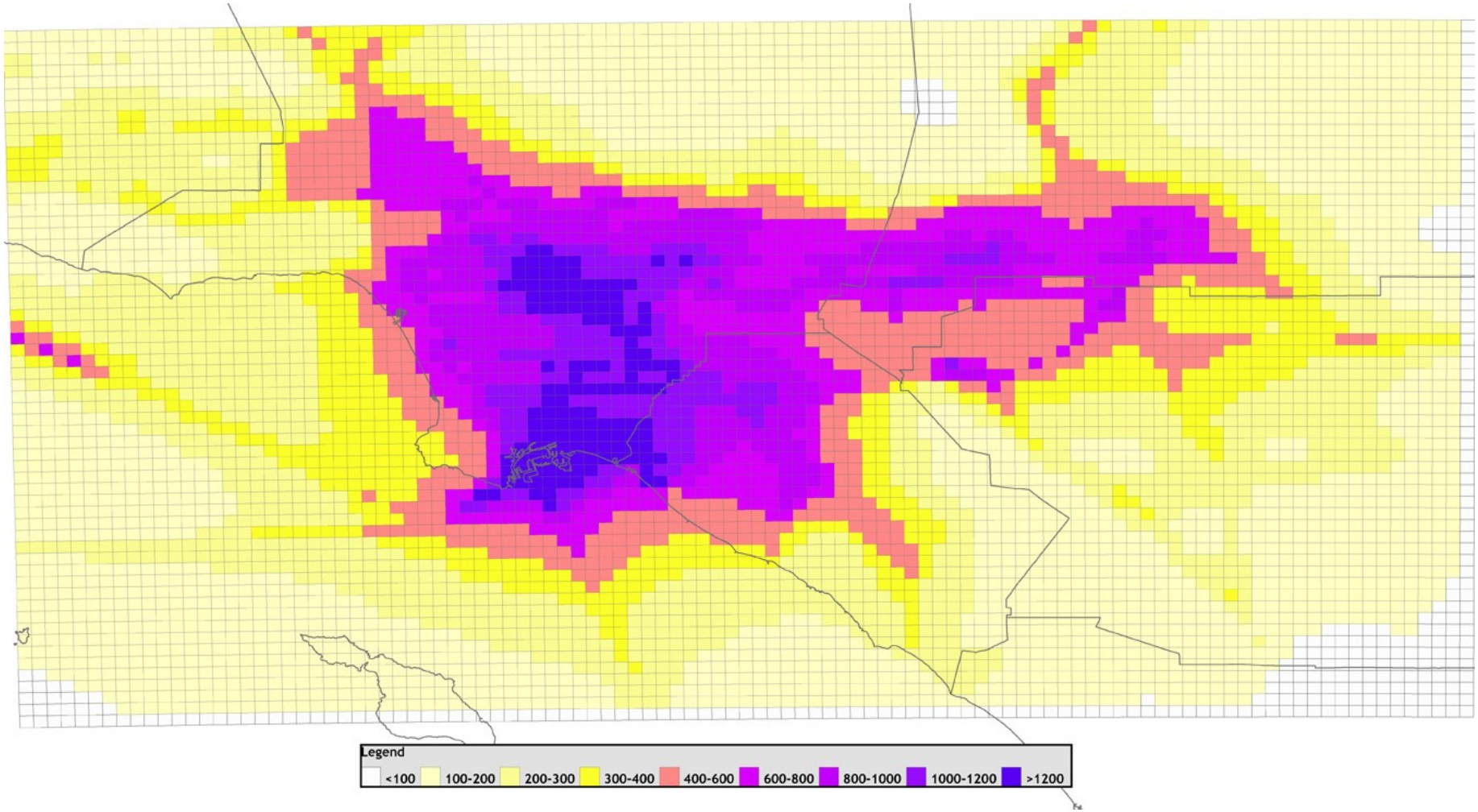
MATES III Modeling

- Updated emissions and modeling
  - CAMx - consistent with AQMP
  - AQMP inventory updated for toxics
  - Improved geographical assignment of diesel vehicle miles – Caltrans/SCAG model
  - Updated meteorology for 2005 consistent with AQMP
  - EMFAC2007 vs EMFAC7G
  - Larger modeling domain
- Grid cell with highest risk at the ports
- Area of increased risk near Central L.A.
- Estimated risks consistent with monitoring data

MATES II Model Estimated Risk



MATES III Model Estimated Risk



Modeled Risk Comparison

- Population weighted risk: 810/million
- 17% below MATES II
  - Emission inventory updates
  - Meteorology inputs
  - Modeling methodology

Non-Cancer Assessment

- Compared annual averages to OEHHA chronic Reference Exposure Levels (CRELs)
- Formaldehyde
  - All fixed sites above CREL of 2 ppb
    - Sites average at 3.6 ppb
    - OEHHA proposes to raise CREL to 7 ppb
    - All sites below proposed CREL
- Manganese
  - All sites well below current CREL of 200 ng/m3
  - OEHHA proposes to lower CREL to 30 ng/m3
  - Three sites above proposed CREL:
    - Fontana : 61.8 ng/m^3
    - Rubidoux: 47.7 ng/m^3
    - Huntington Park: 32.0 ng/m^3

Summary/Policy Implications

- Continued progress in reducing exposure to air toxics
- Risks from air toxics still unacceptable
- Diesel exhaust major contributor to air toxics risk
- Highest levels of risk associated with diesel emissions, including near ports and transportation corridors
- Findings point to importance in reducing diesel emissions as aggressively as feasible

Next Steps

- 90 day public review
- Draft report and technical appendices available on AQMD web site
- Technical Advisory Group review
- Public outreach
- Air Toxic Control Plan update: Summer 2008