

Multiple Air Toxics Exposure Study – MATES IV Draft Report



SCAQMD Governing Board
Meeting

October 3 , 2014

Background

- MATES I: 1987
- MATES II: 1998-99
- MATES III: 2004-2006
- MATES IV: 2012-2013
- Environmental Justice Initiative
- Focus on toxics exposure and risk
 - PM mortality not included

Purpose

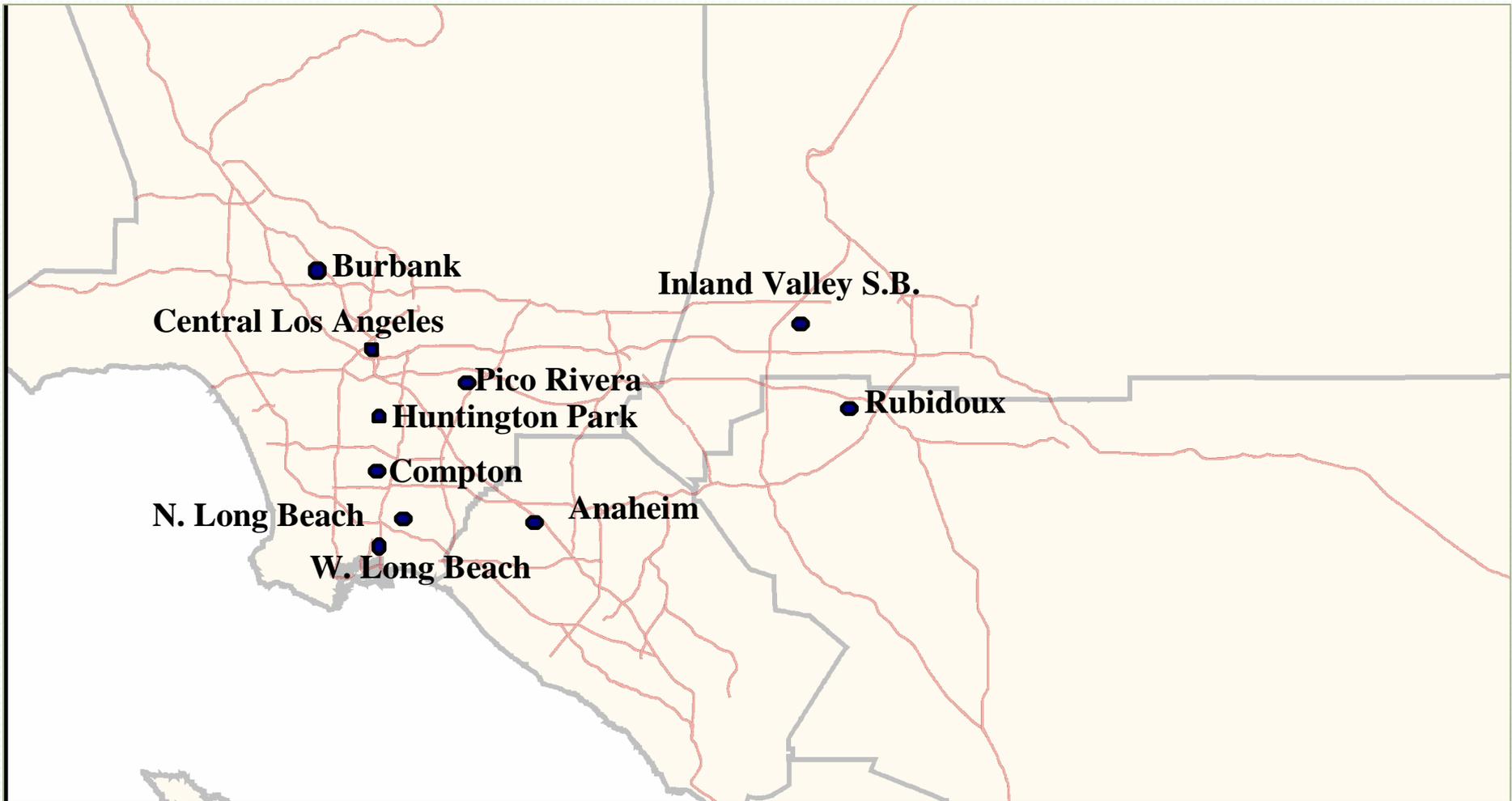
- Provide the public with information on toxic exposure and risk
- Evaluate progress in reducing air toxics exposure
- Provide direction to future toxics control programs

Key Components

- **Monitoring**
 - Added black carbon & ultrafine particle counts
 - Improved analysis methods
 - PAH at selected sites
- **Emissions inventory**
 - Based on latest 2012 AQMP inventory
- **Modeling**
 - Consistent with AQMP modeling platform
 - Extended to include Coachella Valley
- **Technical Advisory Group**
 - Input on study plan and draft report

MATES IV Monitoring Sites

10 sites, every 6th day, July 2012 – June 2013



Substances Measured

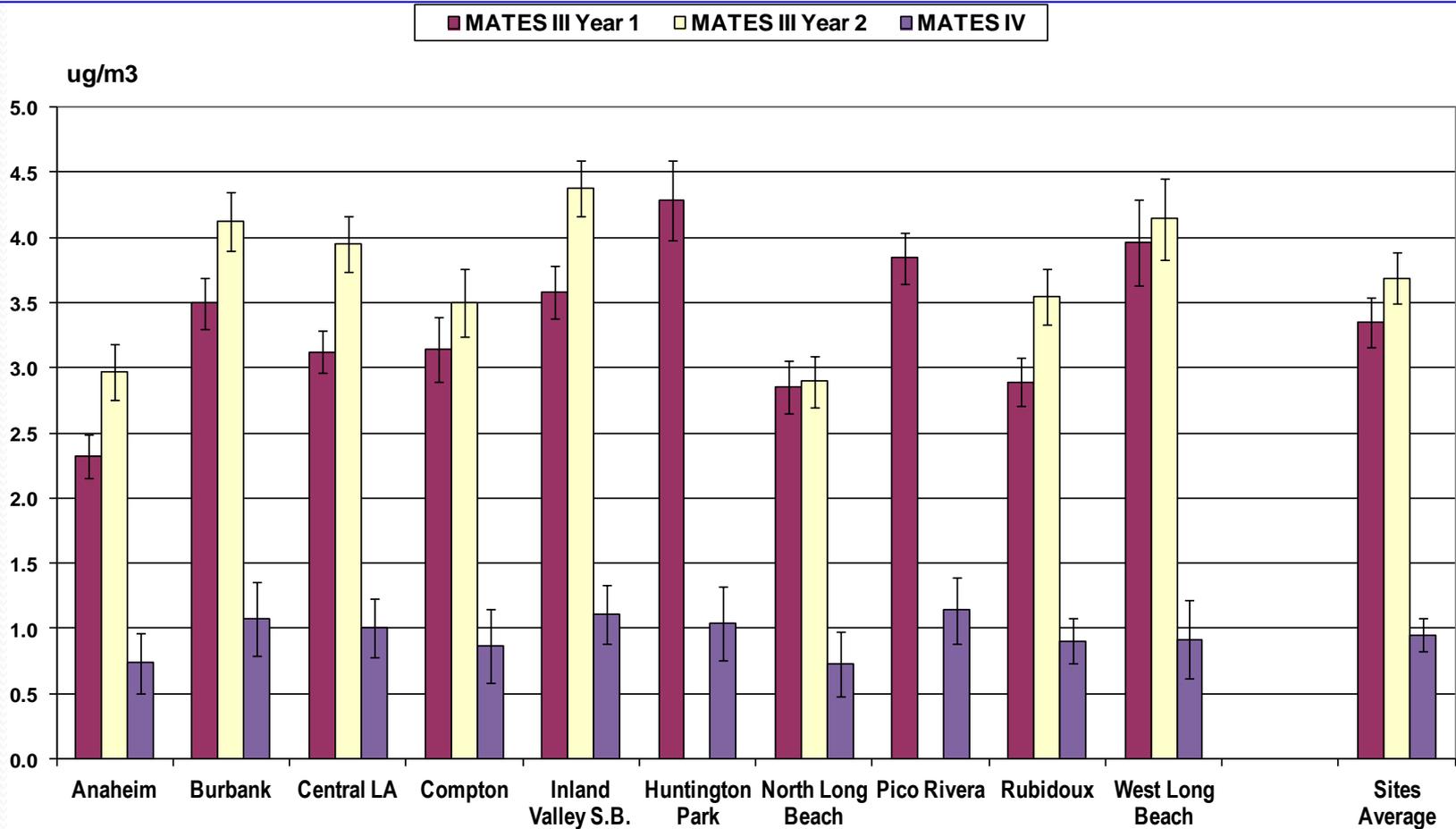
Acetaldehyde	Dichloroethane	Organic Carbon (OC)
Acetone	Elemental Carbon (EC)	PAHs
Arsenic	Ethyl Benzene	Perchloroethylene
Benzene	Formaldehyde	PM_{2.5}
Black Carbon (BC)	Hexavalent Chromium	PM₁₀
1,3-Butadiene	Lead	Selenium
Cadmium	Manganese	Styrene
Carbon Tetrachloride	Methylene Chloride	Toluene
Chloroform	Methyl ethyl ketone	Trichloroethylene
Copper	MTBE	Ultrafine Particles (UFP)
Dibromoethane	Naphthalene	Vinyl Chloride
Dichlorobenzene	Nickel	Xylene
		Zinc

Summary of Major MATES IV Findings

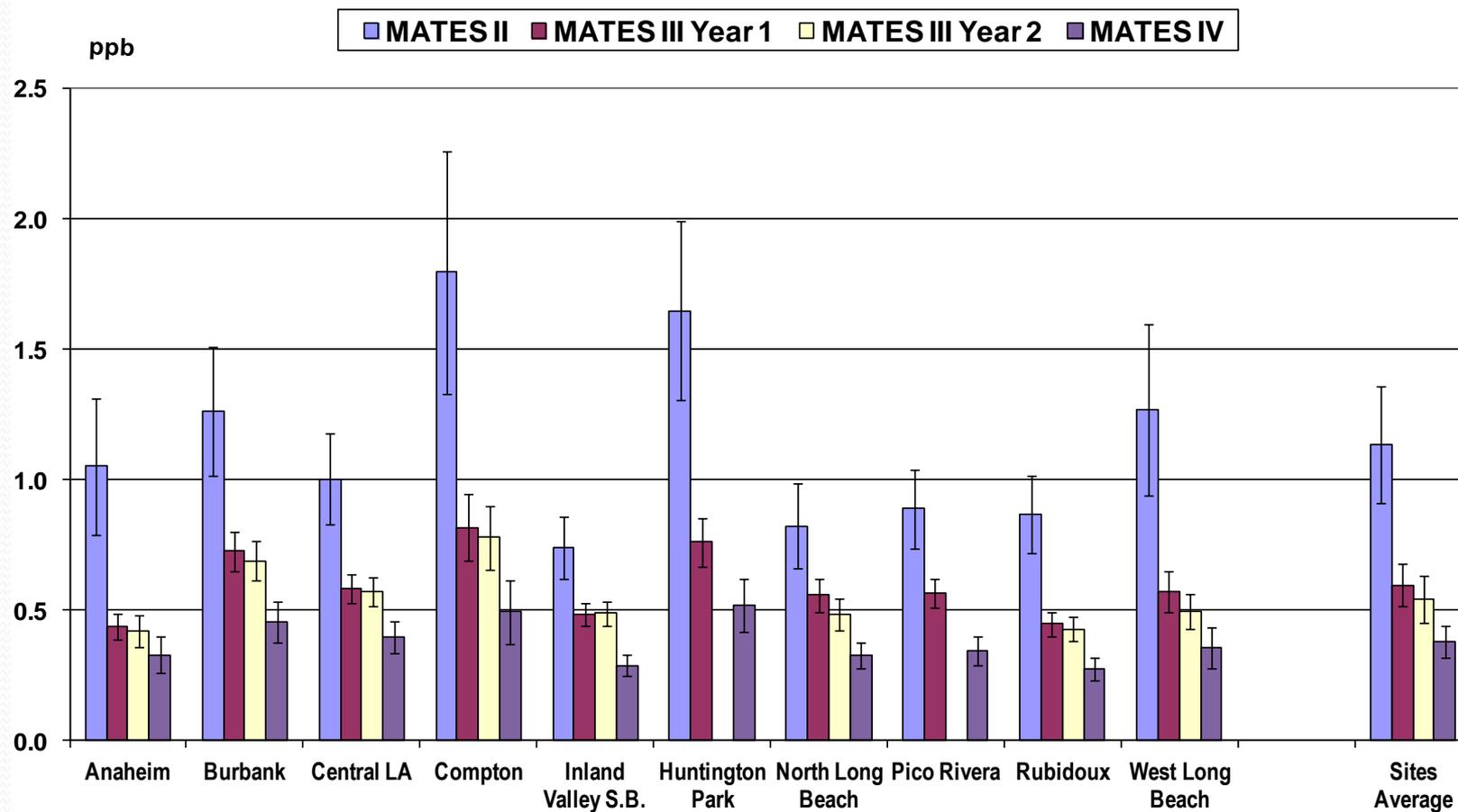
- Cancer Risk has decreased more than 50% between MATES III (2005) and MATES IV (2012)
 - Monitoring, inventory, and modeling approaches all produce similar results
- While Diesel PM exposure decreased by ~70%, it still dominates the overall cancer risk from air toxics
- Highest risk areas near ports and transportation corridors
- Risk from other air toxics continue to decline, with limited exceptions
- Ultrafine Particle measurements show higher levels in areas with higher population and traffic density

Diesel PM Estimates

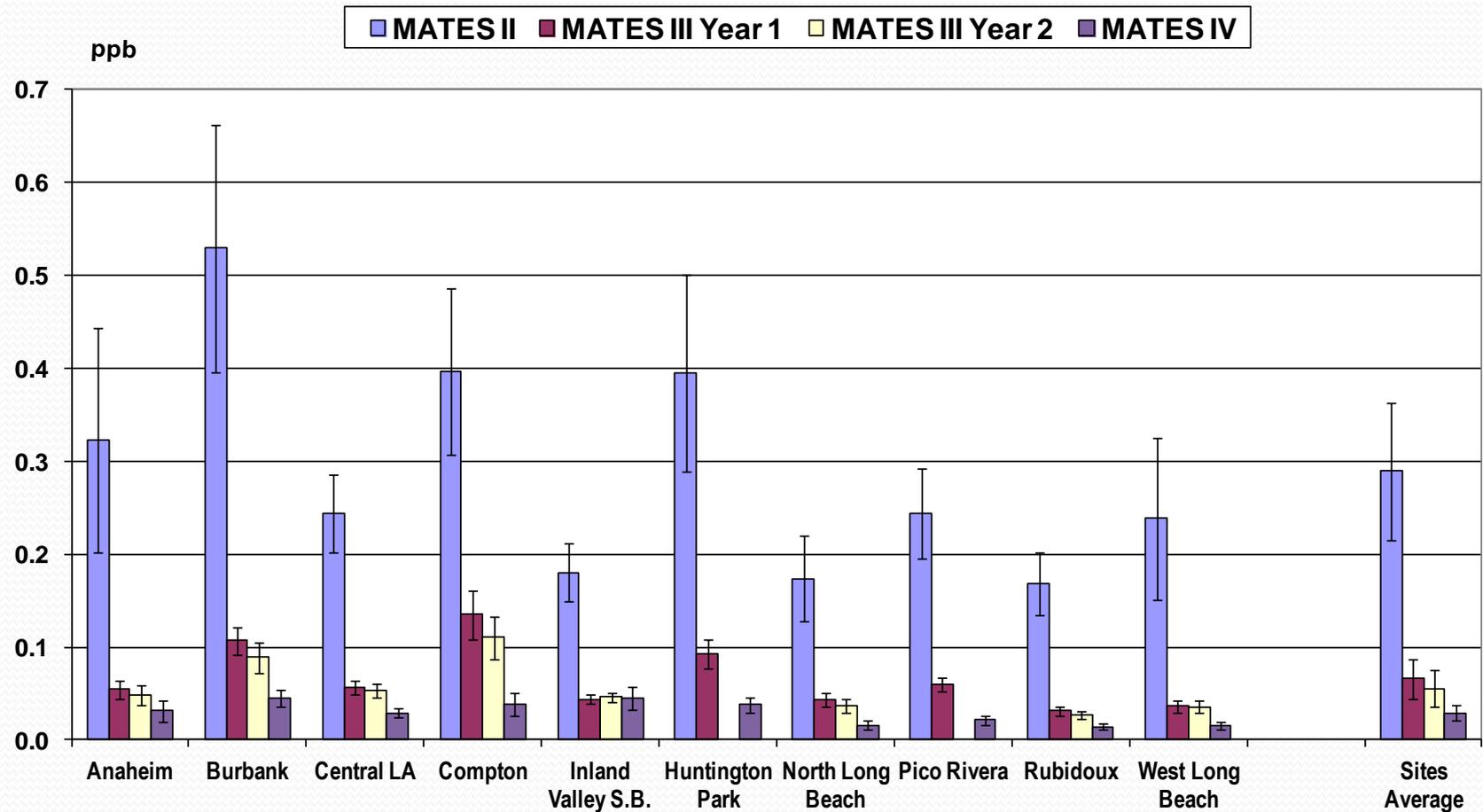
MATES IV Diesel PM ~70% lower compared to MATES III
using emissions ratio method



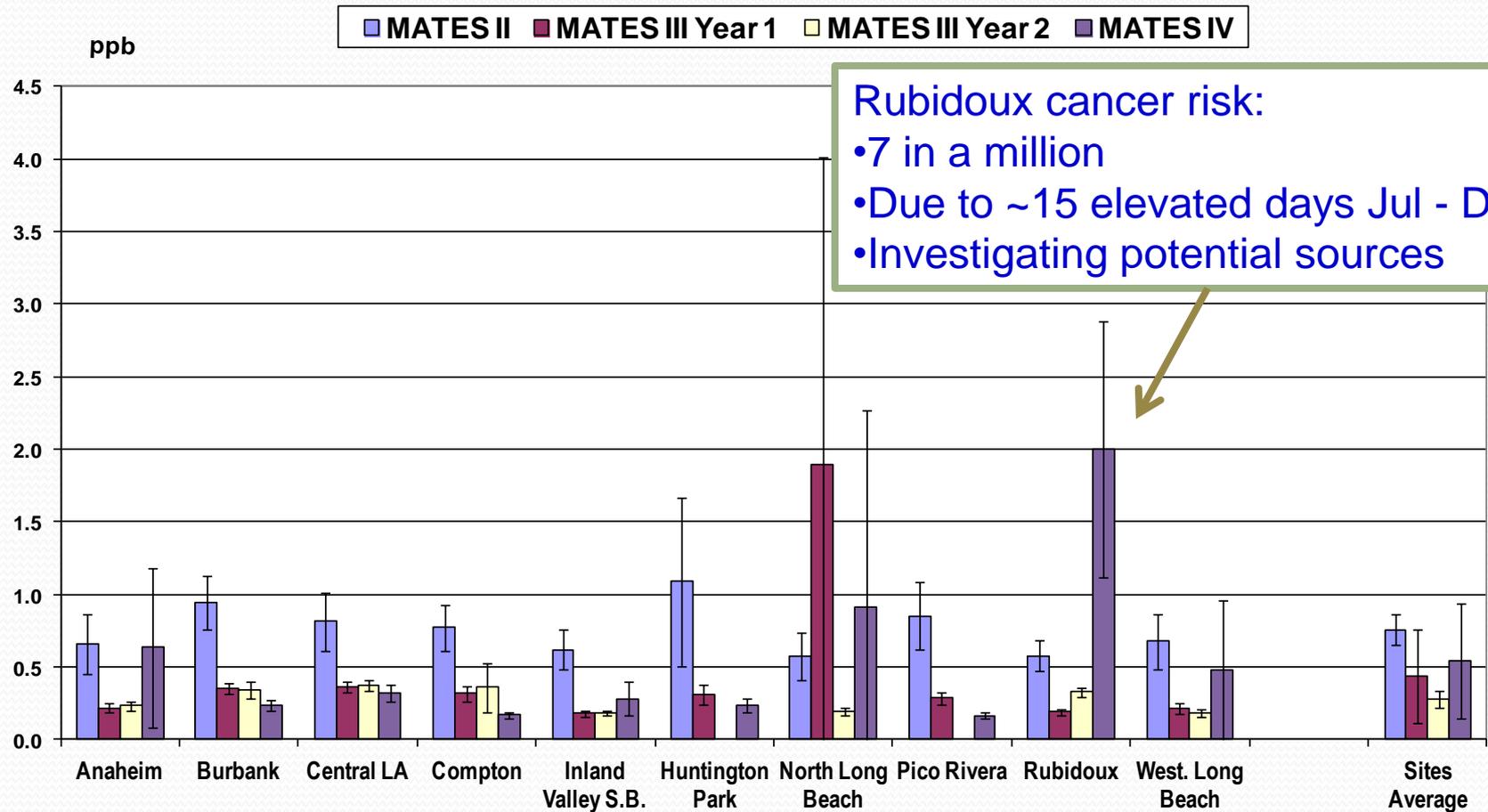
Benzene



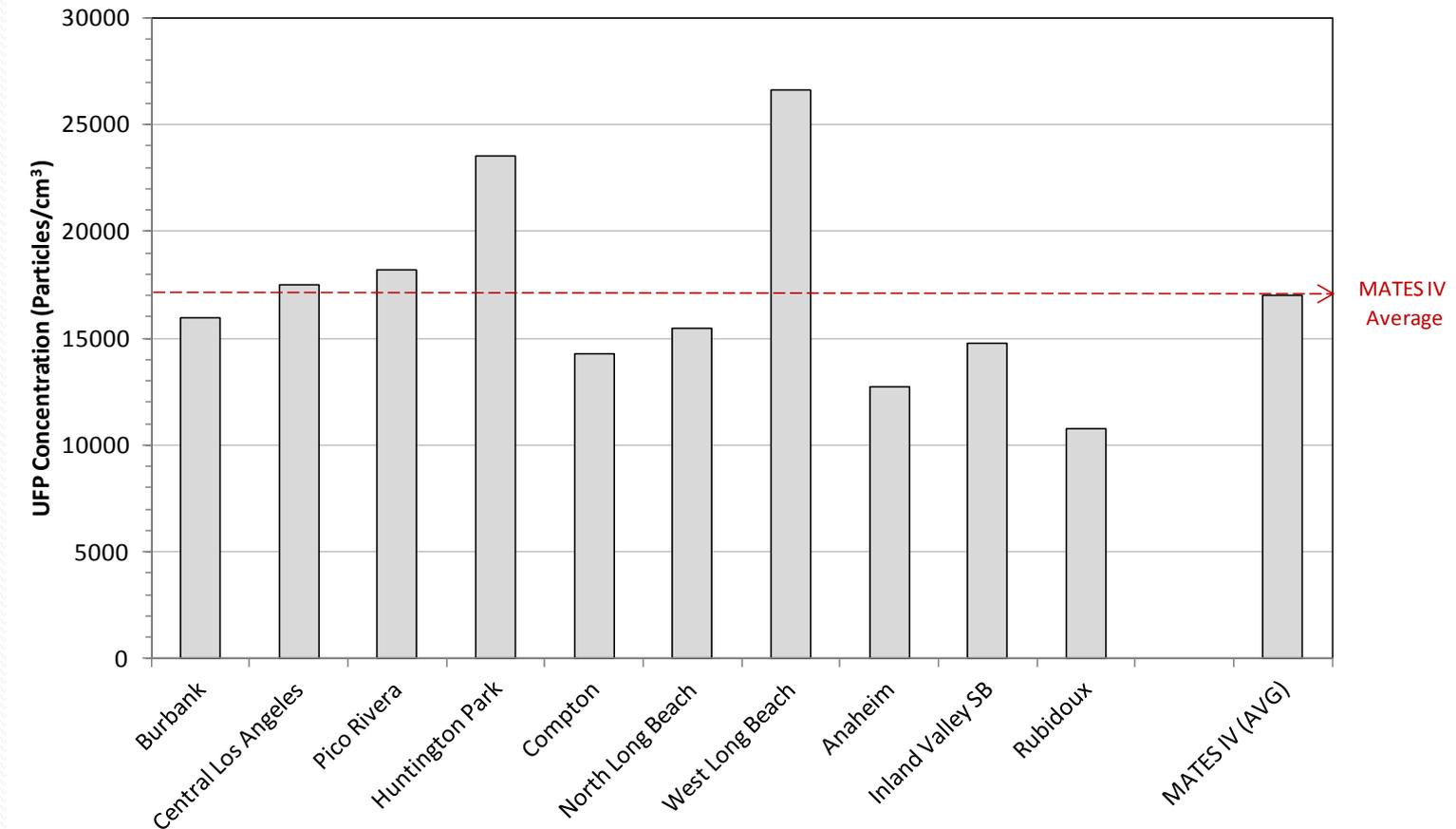
Perchloroethylene



Methylene Chloride



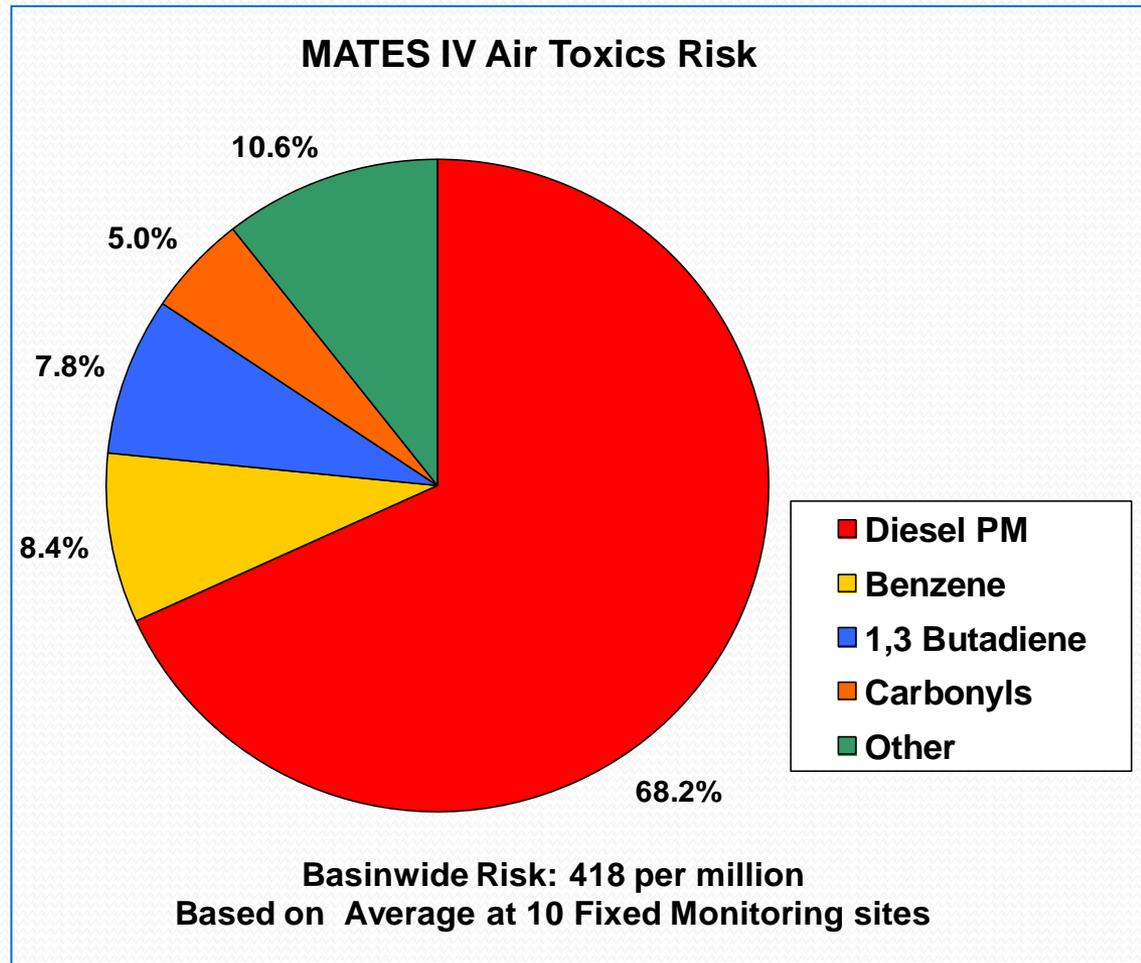
Ultrafine Particle Measurements



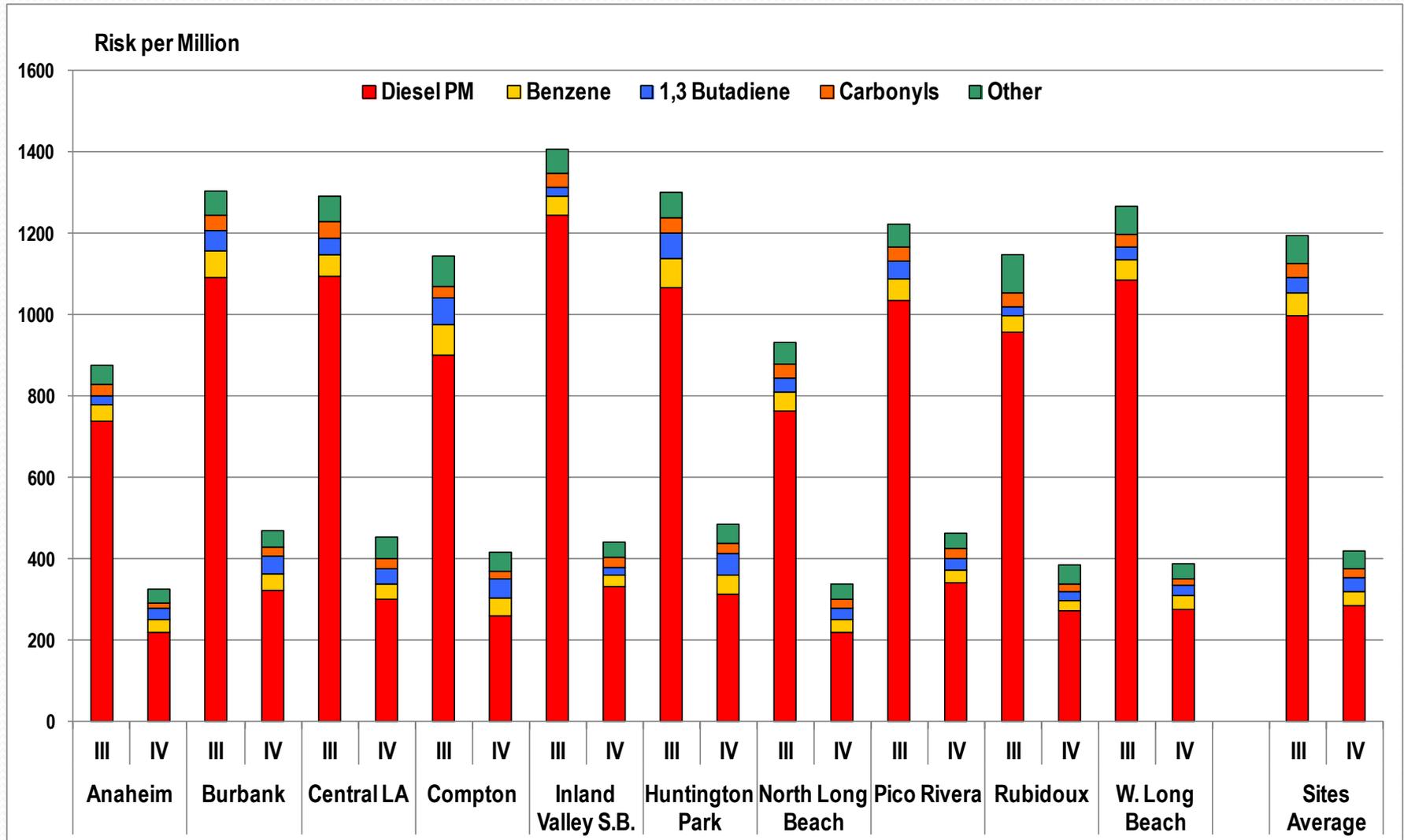
- West Long Beach and Huntington Park show highest particle counts

MATES IV Monitored Air Toxics Risk

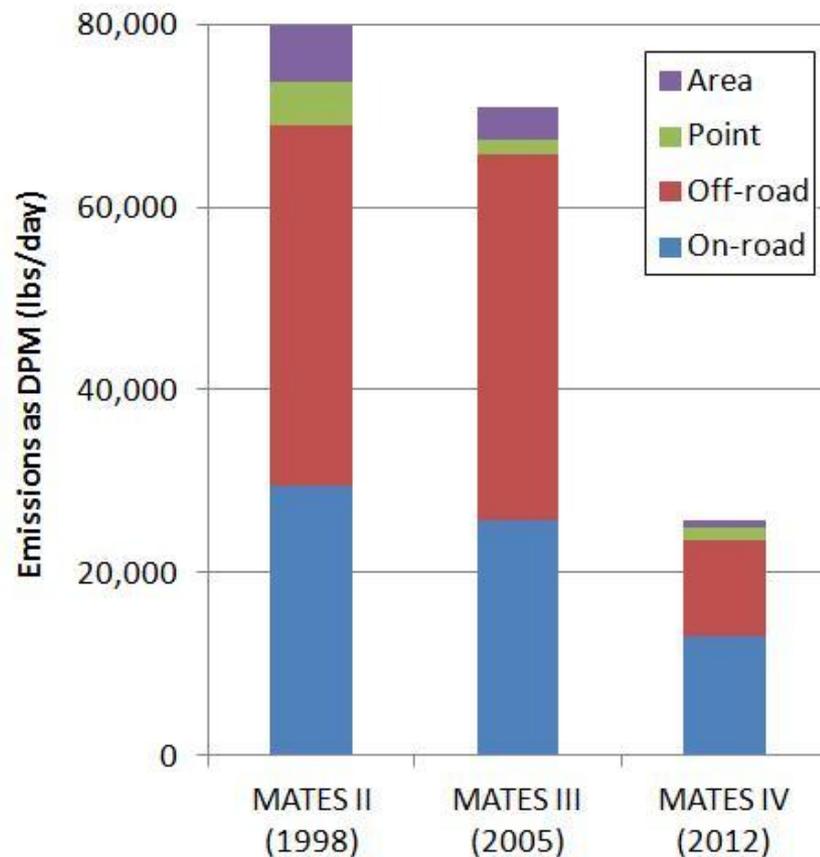
- Estimated basin wide lifetime air toxics risk 418 per million
- 65% overall risk reduction from MATES III based on monitoring
- Mobile sources account for 90% of air toxics risk
- Diesel accounts for 68% of air toxics risk



Monitored Air Toxics Risk by Site: MATES III vs. IV

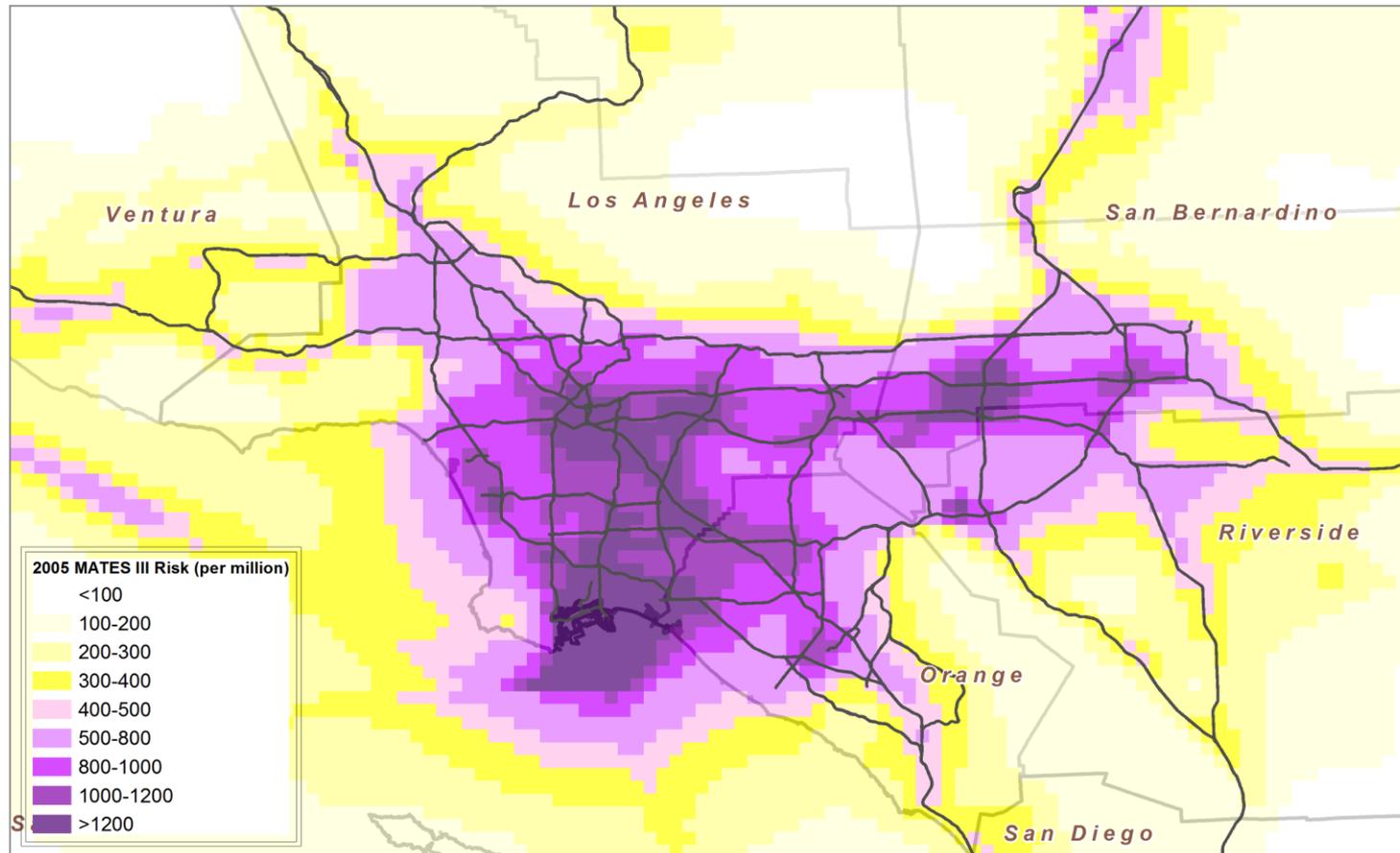


MATES IV Inventory-Based Risk Reductions (potency weighted)

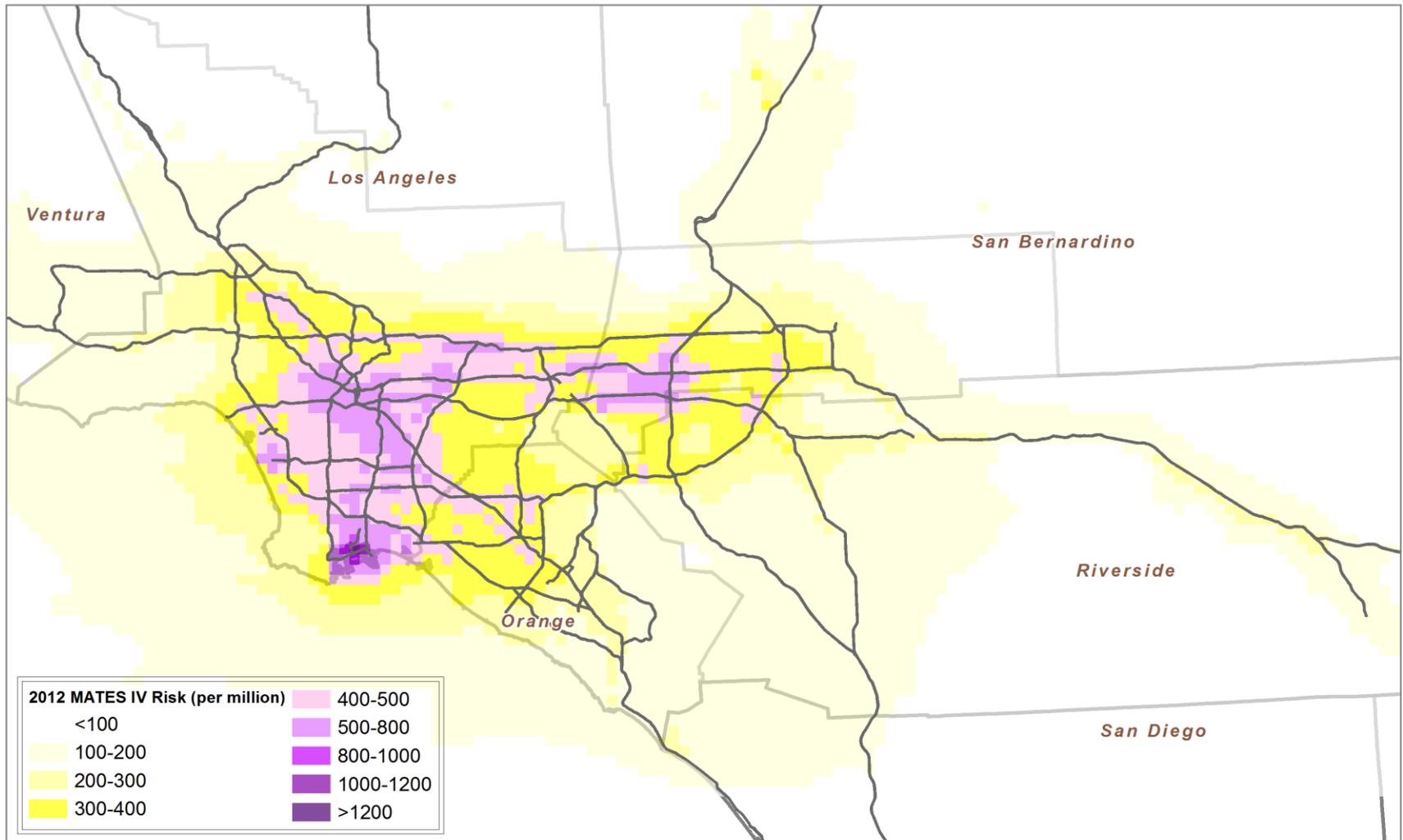


Category	Change from MATES III (%)	Change from MATES II (%)
Area	-77.5	-87.0
Point	-20.8	-72.8
Off-road	-73.5	-73.2
On-road	-49.4	-55.7

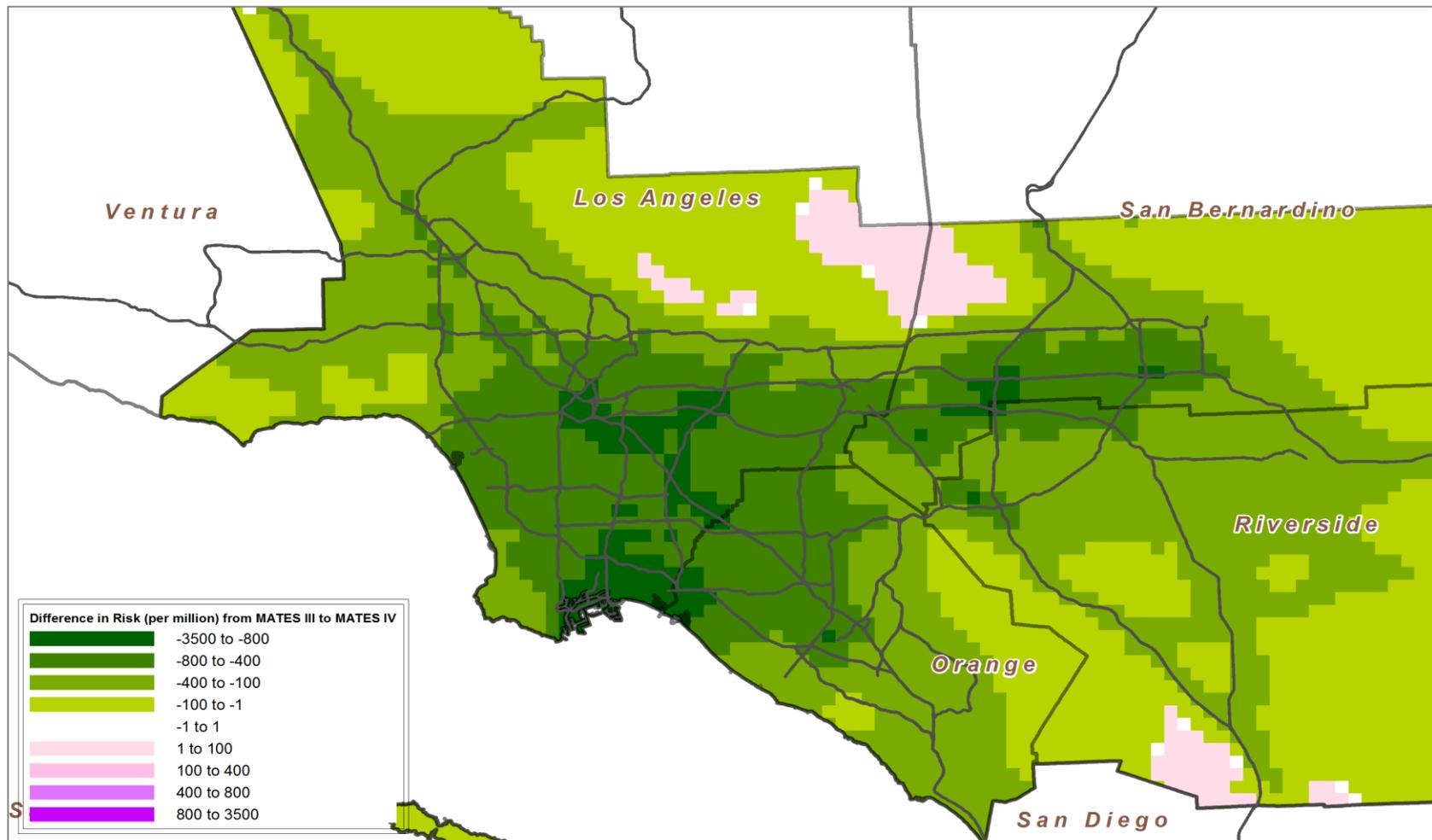
MATES III Modeled Air Toxics Risk



MATES IV Modeled Air Toxics Risk

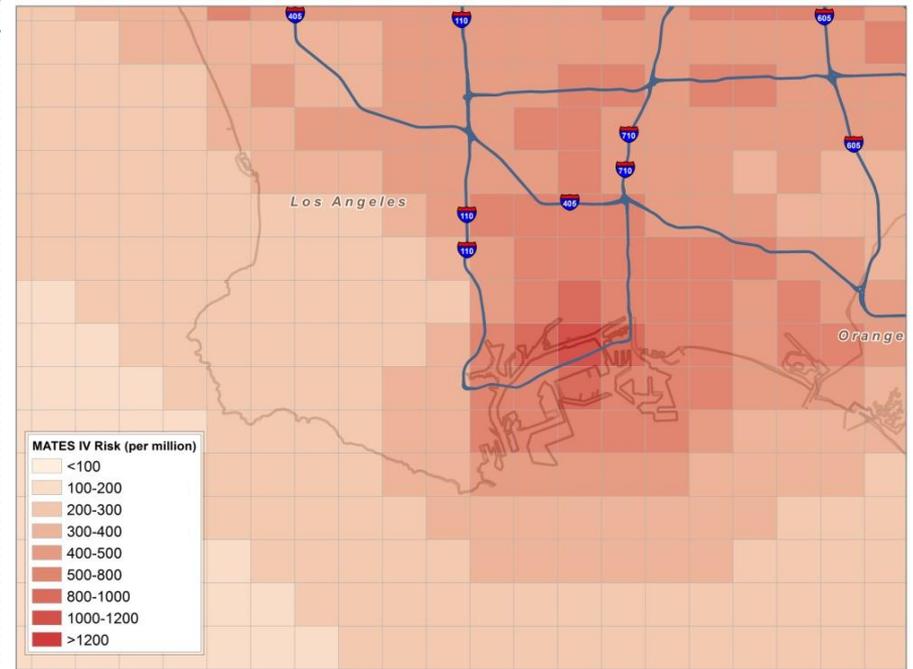


Modeled Risk Difference: 2005 to 2012



Basin and Port Area Population-Weighted Modeled Cancer Risk

Highest Grid Cell Risk 1,057



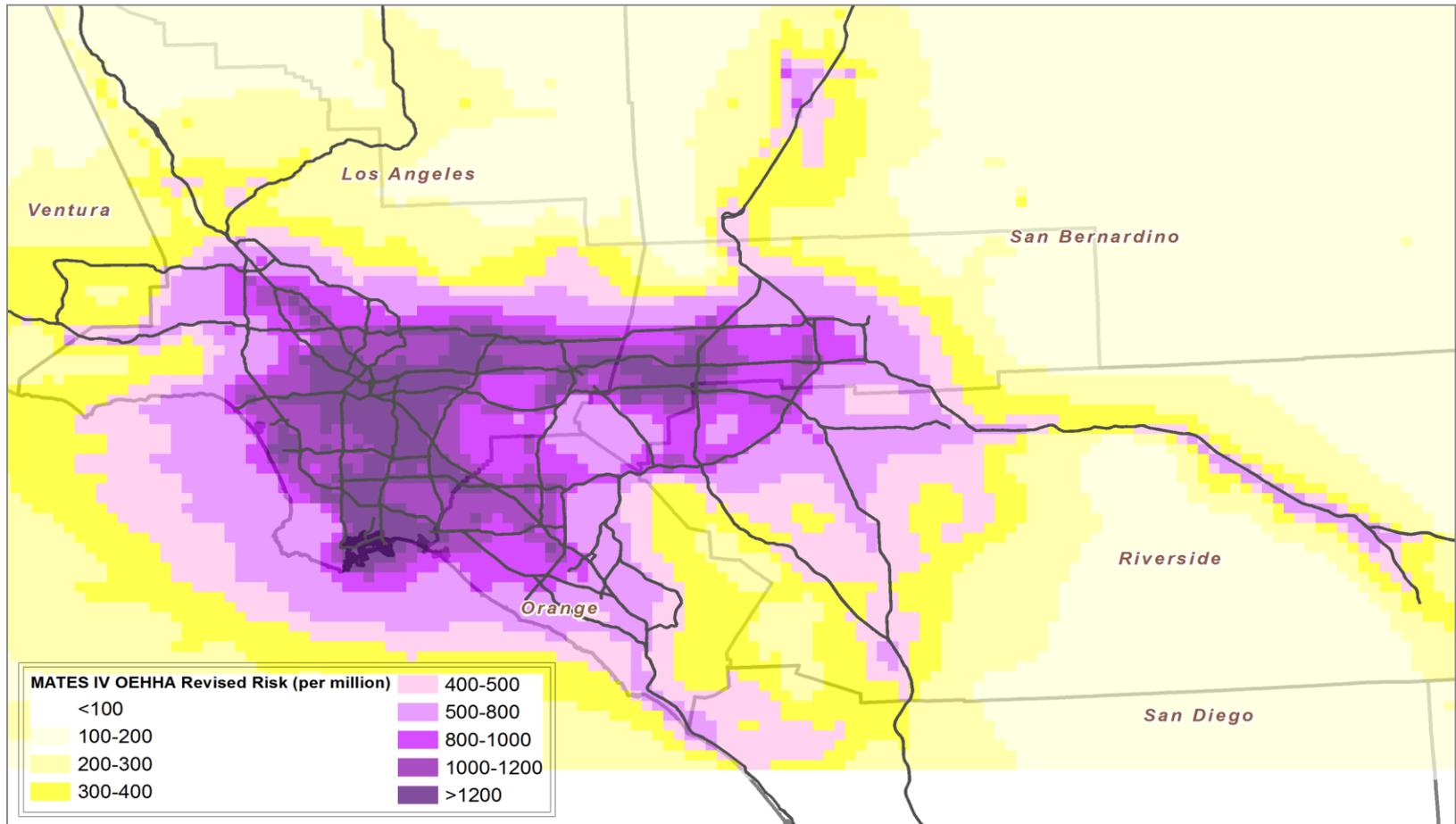
Region	MATES IV		MATES III		Average Percentage Change in Risk
	2012 Population	Average Risk (Per Million)	2005 Population	Average Risk (Per Million)	
Basin	15,991,150	367	15,662,620	853	-57
Ports Area	998,745	480	959,761	1,415	-66
Basin Excluding Ports Area	14,992,806	359	14,702,859	816	-56

CAVEAT

CA Office of Environmental Health Hazard Assessment Updated Risk Assessment Methodology

- Considers childhood susceptibility to carcinogen exposure
- Updates age-specific breathing rates
- Reduces residential exposure period from 70 to 30 years
- Net effect:
 - Inhalation carcinogenic risk may increase by a factor of about 2.7 for the same exposure concentration
 - Actual carcinogenic risk still down by more than 50%
- New guidelines under review, expected to be finalized by 1st quarter

MATES IV Modeled Risk with Proposed OEHHA Methodology



Inhalation Risks go up by factor of about 2.7

Summary/Policy Implications

- Continued and substantial progress in reducing exposure to air toxics
- Residual risks from air toxics still unacceptably high, and higher than we previously estimated given the revised OEHHA methodology
- Diesel particulate exposure substantially reduced, but still the major contributor to air toxics risk, concentrated near ports and transportation corridors
- Importance of continued reduction in mobile source emissions in order to achieve toxics reductions and federal standards

Next Steps

- Release Draft MATES IV Report for 90-day public review today
- Draft Report , technical appendices, and interactive risk map available on AQMD web site
- Final Report: Spring 2015

Next Steps (continued)

- Update AQMD's Air Toxic Control Plan as part of the 2016 AQMP