

PM_{2.5} and Fugitive Dust

USDA NRCS Agricultural
Air Quality Task Force Meeting

Salt Lake City, Utah
May 15, 2008

Emerging Issues Subcommittee

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- Michael Blaser
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- Dr. Trisha Marsh Johnson
- Chris Peterson
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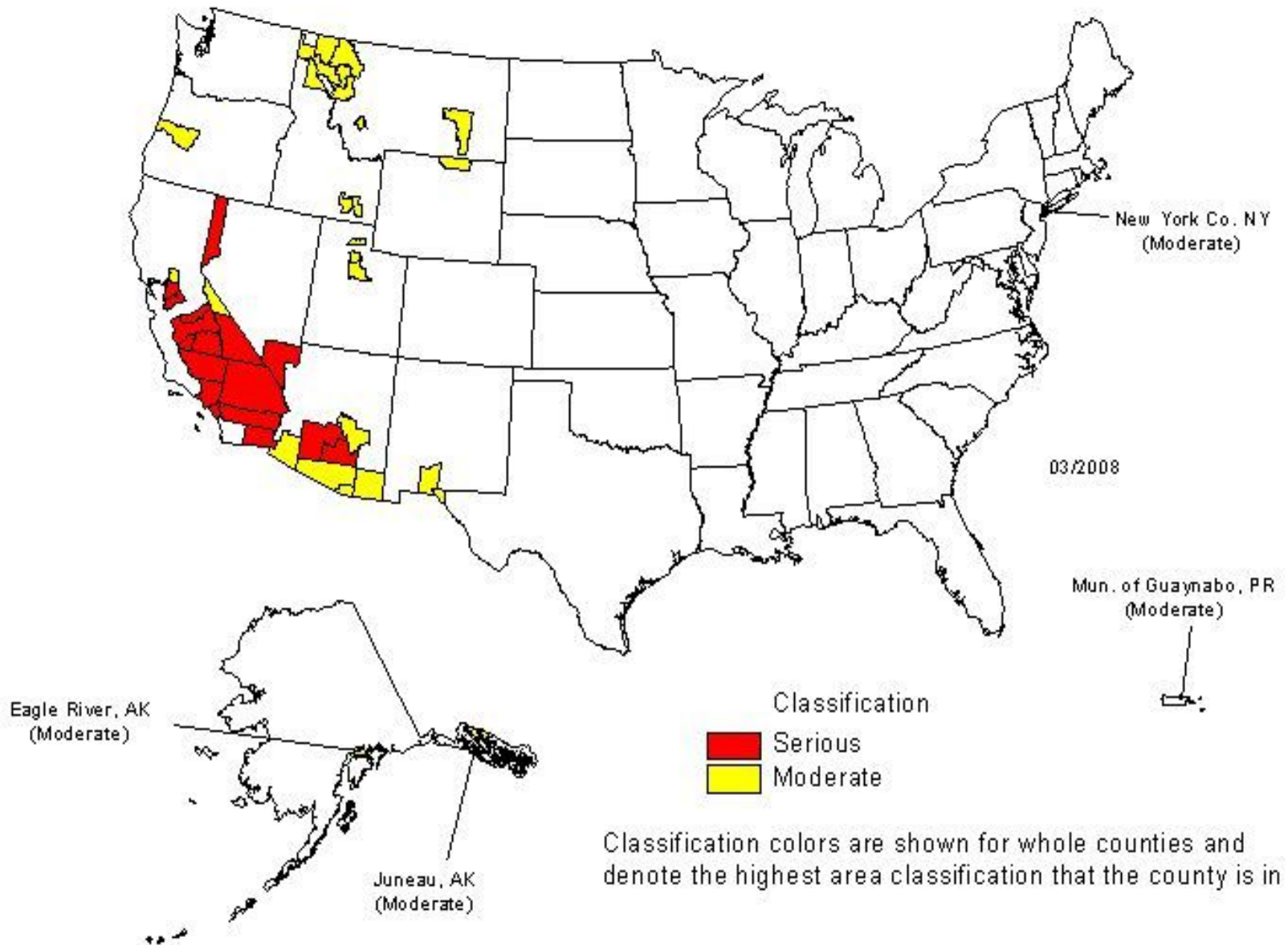
Background

- TSP standard in 1971
- PM₁₀ standard in 1987
- PM_{2.5} standard in 1997
- Revised PM_{2.5} standard in 2006
- First PM_{2.5} plans based on 1997 standard due in April, 2008

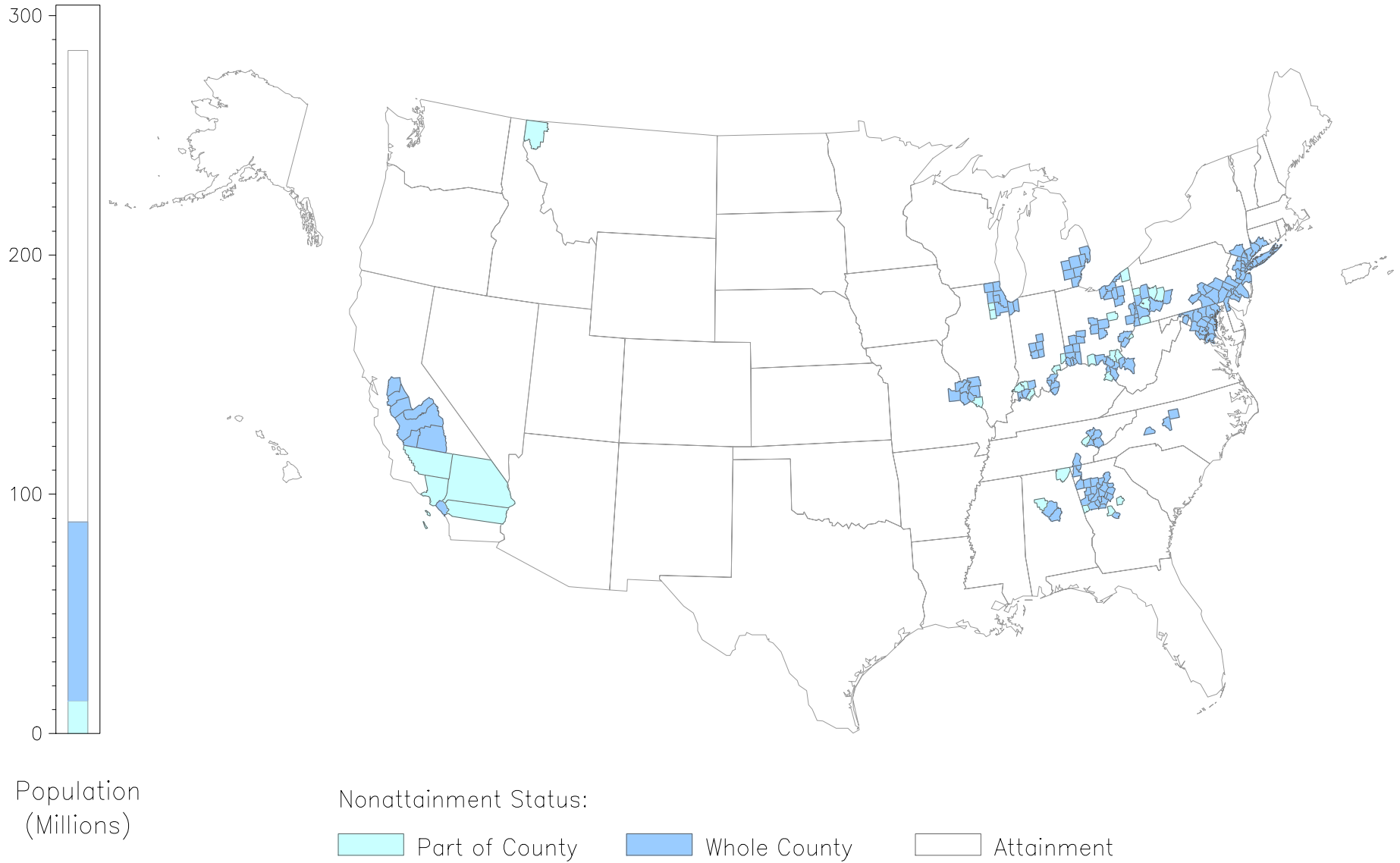
Standards Comparison

		Federal	California
PM₁₀	Annual		20 ug/m ³
	24 hr	150 ug/m ³	50 ug/m ³
PM_{2.5}	Annual	15 ug/m ³	12 ug/m ³
	24 hr	35 ug/m ³	

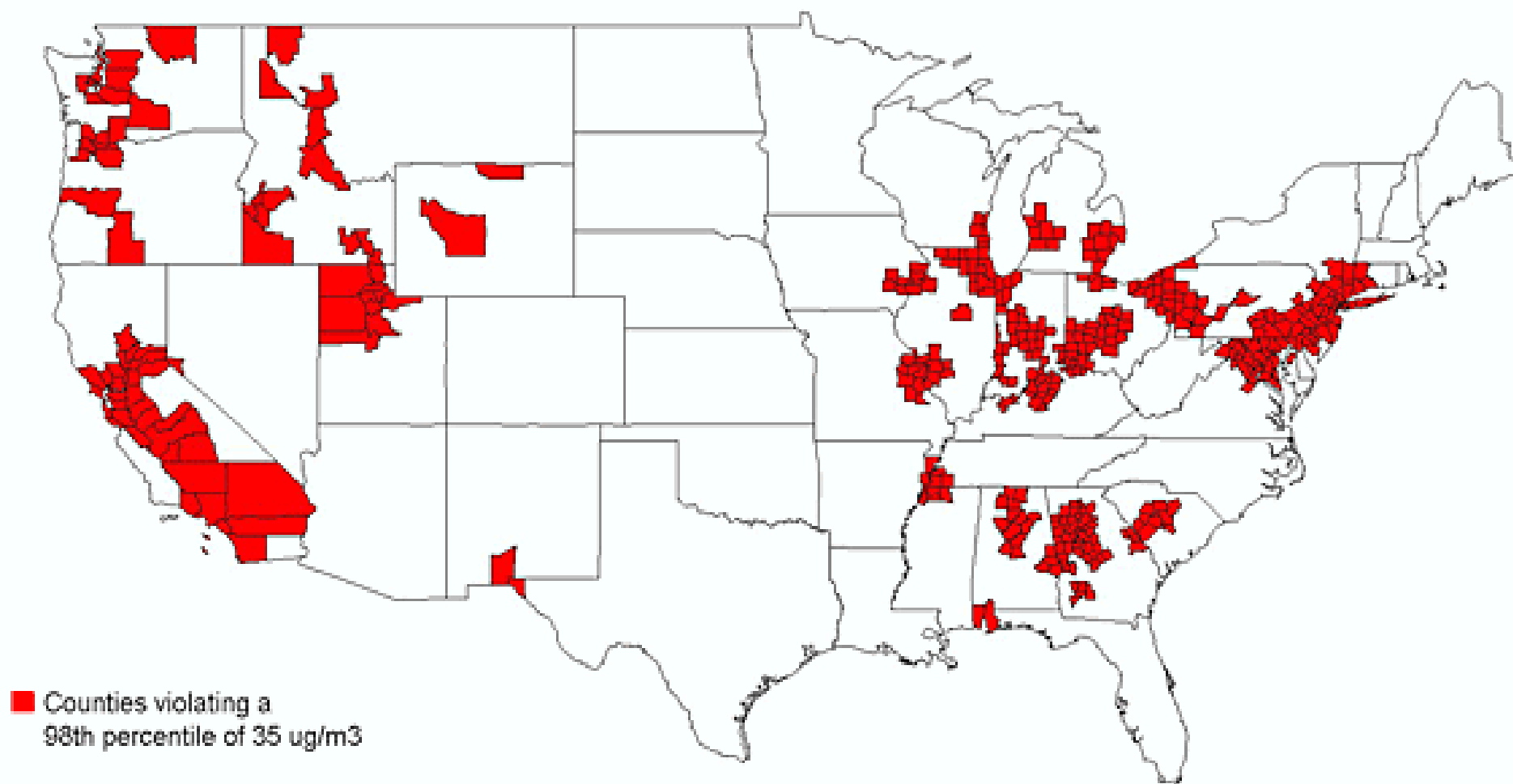
Counties Designated Nonattainment for PM-10



Nonattainment Areas Map – Particulate (size < 2.5 micrometers) United States



Summary of Counties Identified as Violators of PM-2.5 24-H 98th Percentile 35 ug/m³ for 2004 - 2005



AAQTF Recommendations

May, 2007

- Conduct additional research on NH_3 and the formation of $\text{PM}_{2.5}$
- Conduct additional research on dry deposition of gaseous ammonia and ammonium aerosols
- Conduct research to establish process-based models for NH_3 emissions from CAFOs
- Conduct research to understand the role of VOCs in the formation of $\text{PM}_{2.5}$

AAQTF Recommendations

November, 2005

- Develop PM_{2.5} emission inventories, emission factors, and process-based modeling for high-priority, targeted agricultural practices

AAQTF Recommendations

June, 2005

- Recommend that EPA address the sampler bias issue associated with ambient concentration measurements using FRM samplers
- Develop PM_{2.5} emission inventories, emission factors, and process-based modeling for high-priority, targeted agricultural practices

AAQTF Recommendations

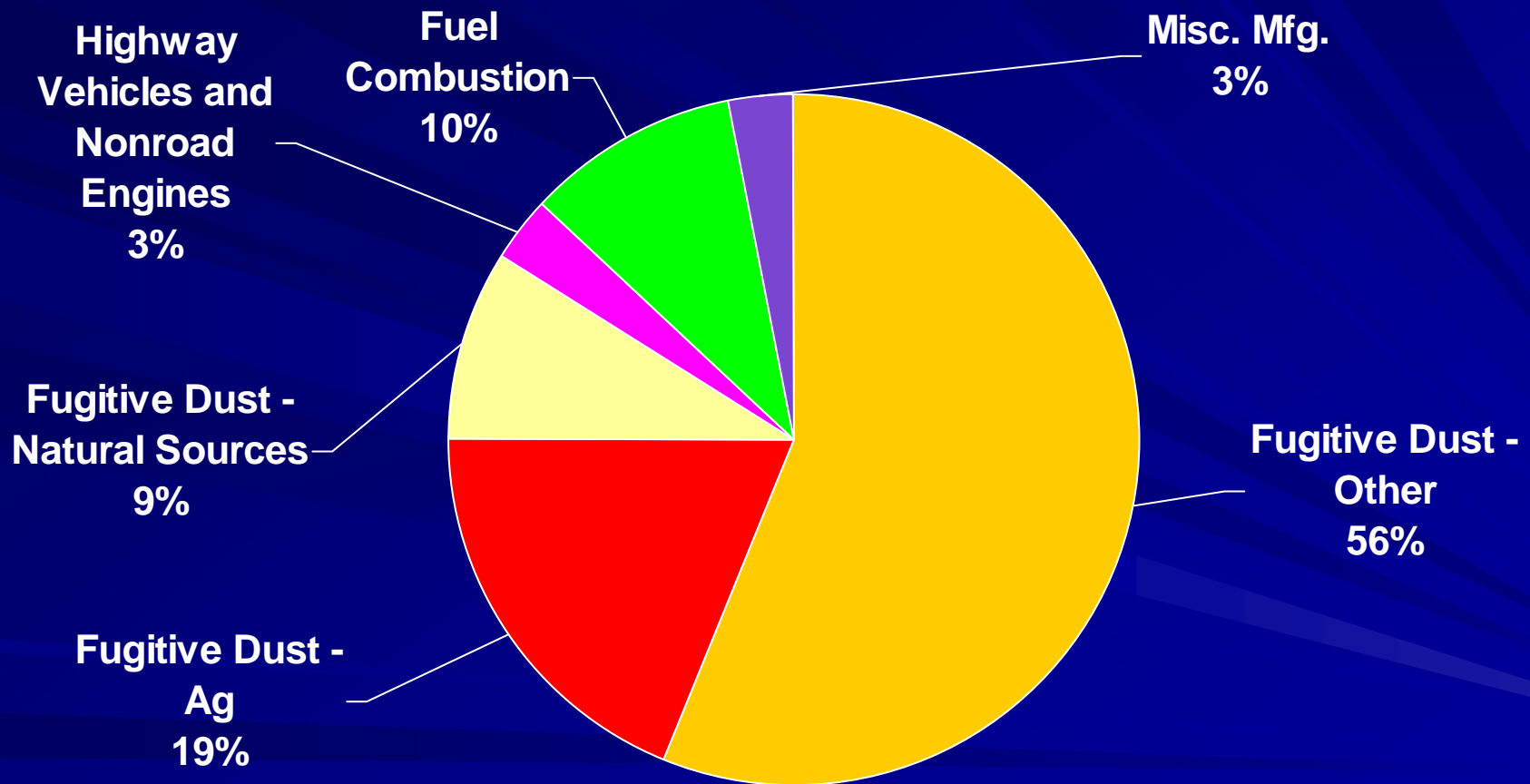
June, 2005

- Develop accurate PM_{10} and $PM_{2.5}$ emission factors from agricultural activities
- Determine contribution of agricultural activities to ambient concentrations of $PM_{10}/PM_{2.5}$
- Improve PM_{10} and $PM_{2.5}$ sampling methodology
- Study role of NH^3 in producing $PM_{2.5}$ emissions
- Determine methodologies to speciate PM_{10} and $PM_{2.5}$
- Improve PM_{10} and $PM_{2.5}$ dispersion modeling methodologies

Guidance

- Controlling Particulate Matter Under the Clean Air Act: A Menu of Options
 - STAPPA/ALAPCO – July, 1996
- Fugitive dust is largest source of PM_{2.5} emissions
- Annette Sharps always says, “When you don’t have specific emission factor data,
...”

PM_{2.5} Emissions by Source Category



WRAP PM_{2.5} Study

- MRI Report – October, 2005
- Address issues associated with FRM dichotomous samplers (i.e. particle bounce)
- 100 wind tunnel tests
- Findings
 - AP-42 based emission factors based on high volume/impactor systems have a bias factor of 2 compared to FRMs
 - Test data support a PM_{2.5}/PM₁₀ ratio of 0.1 for typical fugitive dust sources

SJV PM_{2.5} Plan

- Inclusion of fugitive dust sources, such as in-field agricultural activities (tillage, harvesting), cotton gins, unpaved roads, storage piles and CAFOs
- Feasibility studies on potential control measures

Concerns

- Agricultural fugitive dust sources could be regulated unnecessarily
- There are no management practices developed for control of directly emitted $PM_{2.5}$
- With all of the potential new $PM_{2.5}$ non-attainment areas, this could be a major problem for the agricultural community.

Recommendations

- There needs to be greater scientific clarity on the role that fugitive dust plays in the emissions of $PM_{2.5}$

Recommendations

- There is a substantial need to better understand the issue of potential oversampling by current PM_{2.5} sampling devices.

Recommendations

- In sum, steps need to be taken to ensure that any required $PM_{2.5}$ management practices are accurately targeting the true sources of $PM_{2.5}$ emissions.