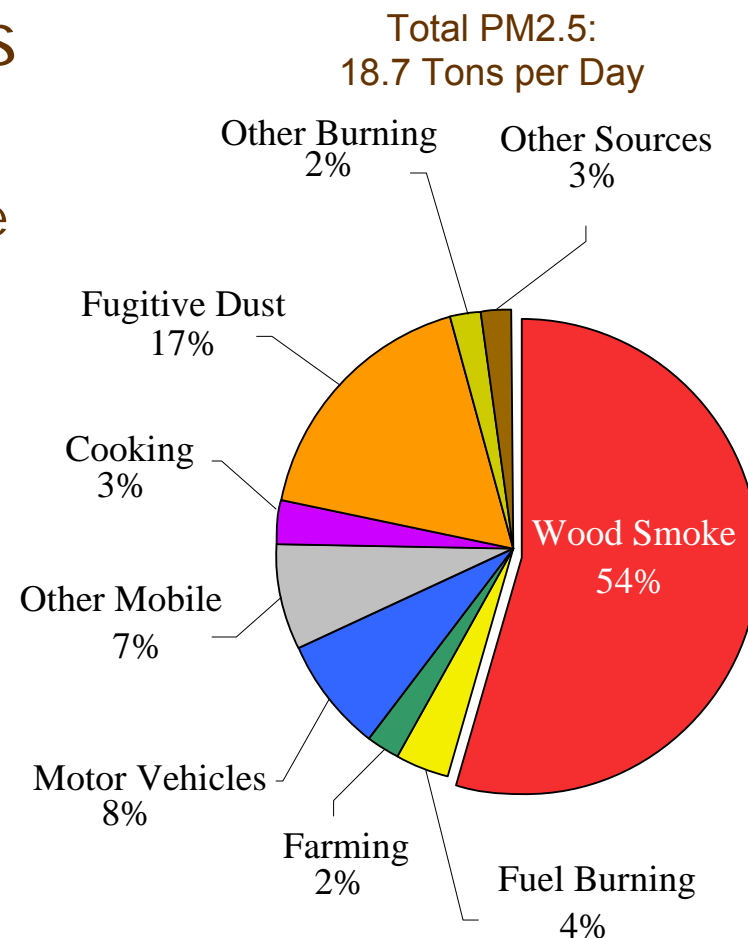


Rule 421 – Mandatory Episodic Curtailment of Wood and Other Solid Fuel Burning



Introduction

- Fine particle pollution exceeds health standards
 - Particle pollution can cause premature death, strokes, heart attacks, aggravated asthma, and additional impacts to children
- Highest PM concentrations in wintertime
- Wood smoke is single largest source of wintertime particles
- Scientific consultants showed significant benefits from Rule 421



Current Rule 421 Requirements

- In effect November 1st through end of February
- Restrictions:



Voluntary curtailment



Stage 1



Stage 2

- **Affects Residents and Businesses:**
 - Wood, pellets, and manufactured logs
 - Indoor/outdoor fireplaces, fireplace inserts, and stoves
- **Exemptions**
 - Natural gas, propane and electric fireplaces
 - Sole source of heat
 - Cooking (e.g. barbeques)
 - Financial Hardship
 - Religious activities
- **How do I find out if I can burn?**
 - Call [1-877-NOBURN5](tel:1-877-NOBURN5) (1-877-662-8765)
 - Online www.airquality.org or www.SpareTheAir.com
 - E-mail or text message through Air Alert at www.SpareTheAir.com
 - Sacramento Bee weather page
 - Radio and TV weather broadcasts

Why Amend Rule 421

- Current Rule 421 has significant benefits
 - Stage 1 average daily air benefit of 10%
 - Stage 2 average daily air quality benefit of 23%
 - 40% fewer days above health standard
- Proposal has modest but important benefits
- We need these benefits plus others to meet PM2.5 requirements
- 2010 - 2012 – will establish benefits estimates for PM2.5 plan due in 2012
- Increased benefits from this rule now will reduce the level of commitments to adopt other, more costly regulations in 2012 plan

Potential Additional Control Measures

Cost Effectiveness of Proposed Amendment \$3.14 - \$5.32 / pound



Agriculture
Unknown



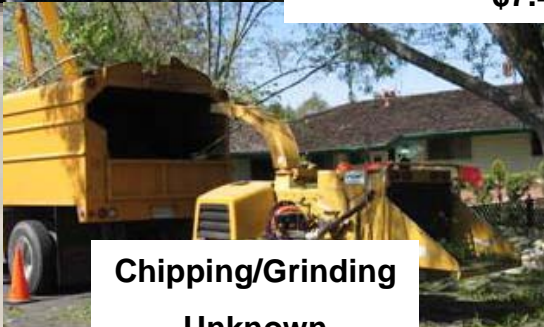
Replacement on re-model/resale
\$7.48/lb



Unpaved Roads
\$6.15/lb



Efficiency of control devices
Unknown



Chipping/Grinding
Unknown



Ag, Non-Ag & Prescribed Burning
Unknown



Paved Roads
\$1.43/lb



Bulk Material Storage
\$14.12/lb

Proposed Rule Changes

	Optional threshold changes ($\mu\text{g}/\text{m}^3$)						
	Current Rule	Recommended Change		Option A	Option B		
Voluntary threshold	>25	>25		>20 or >25	>20		
Stage 1 threshold	>35	>31		Eliminated	>25		
Stage 2 threshold	>40	>35		>30	>30		
Changes in Number of No Burn Days							
	Stage 1	Stage 2	Stage 1	Stage 2	Single Stage	Stage 1	Stage 2
Average # of No Burn days	7	16	5	23	31	13	31
Average additional # of No Burn days	-		5		8	21	
Average # of voluntary No Burn days	22		17		33 @ 20 $\mu\text{g}/\text{m}^3$ 13 @ 25 $\mu\text{g}/\text{m}^3$	20	
Contingency Option – Automatically reduce threshold to 20 $\mu\text{g}/\text{m}^3$ if Sacramento does not meet federal health standards by 2014 or 2019 deadlines (41 additional No Burn days)							

Outreach & Comments

- 5 Public workshops conducted July 2009
 - Our Region ads published in Sacramento Bee
 - Notices sent by mail and e-mail
 - Meetings with HBPA & Retailers, Sacramento Area Realtors, and Breathe California
- Change made to Staff's Workshop
Recommendation in response to comments
 - Maintain two stage program with limited exemption for certified and pellet devices on Stage 1 No Burn
- 200+ comments received, other comments:
 - Opposed Rule 421 or changes to it
 - Request change to prohibit all visible smoke
 - Supported elimination of EPA certified device exemption, or more stringent Option B

Conclusion

- Staff Recommendation
 - Determine that the rule amendment is exempt from CEQA
 - Adopt the resolution approving Staff's recommendation
- Could Consider Other Options (Option A, B, or Contingency)
 - More health protective
 - Increased costs on affected businesses and residents
 - May decrease compliance rates

Additional Information Available as Backup

Backup Slide List

- Frequently Received Questions
- 2008/2009 Check Before You Burn Calendar
- Violation Map
- PM Health Effects Details
- Transport Analysis
- Seasonal PM Pollution Chart
- Spatial Transport Maps / Station
- Monitor Diurnal Concentration Chart
- Socioeconomic
- Gridded Emissions
- Emissions Inventory / Wood Usage Rates
- Per Device Emission Rate & Annual Emissions
- # of Violations at Each Monitor

Frequently Received Questions

- Why change the rule this year?
 - 2010-2012 benefits will be used in plan, if this rule is more effective, then reductions from other regulations will be avoided
- Why eliminate the exemption for certified/pellet devices when that encourages upgrades to cleaner EPA certified/pellet equipment?
 - This is not in the staff's proposal, however, upgrading fireplaces with EPA certified or pellet stoves results in emissions increases because they are generally used more.
- Why don't you just ban visible smoke, every day?
 - Over a hundred thousand homes in Sacramento County have fireplaces that generally cannot be used without emitting visible smoke. The cost of replacement/repairs is high, and may increase emissions for the reasons noted above.
 - A high degree of public acceptance is important to maintain high voluntary compliance rates. Enforcement costs would be prohibitive now to ban all visible smoke.
- Why not prohibit "gross polluters" - open hearth fireplaces?
 - Although fireplaces emit more on a per hour basis. Fireplaces are not used as frequently as EPA certified and pellet stoves/inserts.
- Why not require retrofit of devices on sale of property?
 - Other areas have this requirement. It costs more and takes longer to achieve air quality benefits than episodic wood burning restrictions.
- What other efforts is the District doing to reduce pollution?
 - District provides financial incentives to replace with cleaner devices (including gas/electric)
 - Prohibits new installations of dirty stoves/inserts
 - Other NOx, VOC, and PM controls by federal, state and local regulations

2008 – 2009 Mandatory No Burn Forecasts



= Burn cleanly



= Burning discouraged



= Stage 1 no burning unless certified/pellet



= Stage 2 no burning

November

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
White	White	White	White	Yellow	White	Orange
White	White	Yellow	White	White	White	White
Yellow	Orange	Yellow	White	White	White	Red
Red	Red	Orange	Orange	Red	Red	Yellow

January

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Light Blue	Light Blue	Light Blue	Light Blue	Yellow	White	White
Yellow	Red	Yellow	Red	Yellow	White	Red
Red	Red	Red	Red	Red	Red	Red
Red	Red	Red	Yellow	Yellow	Yellow	White
White	White	White	Yellow	Orange	Red	Red

December

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Orange	Yellow	Yellow	Red	Red	Orange	Red
Orange	Yellow	Yellow	Red	Red	Orange	White
White	White	White	White	White	White	Yellow
Yellow	White	Yellow	White	White	White	Yellow
Yellow	Yellow	Yellow	Yellow	Light Blue	Light Blue	Light Blue

February

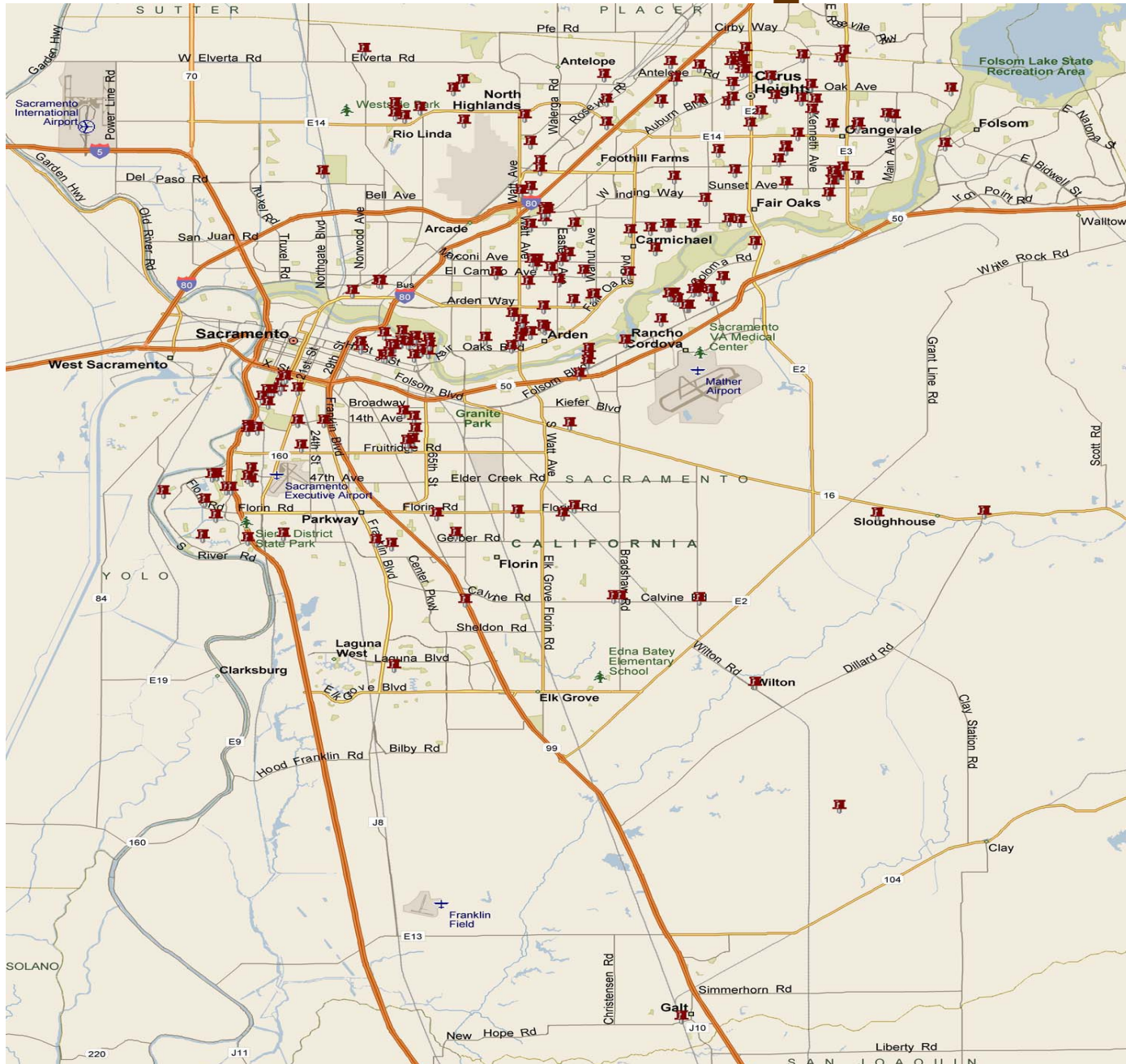
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Red	Red	Red	Orange	White	White	White
White	White	White	White	White	White	White
White	White	White	White	Yellow	Yellow	Yellow
White	White	White	White	White	White	White
Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue

28 – voluntary days

10 – Stage 1 days

28 – Stage 2 days

Violation Map



PM Health Effects Details

- Previously well established PM health effects¹
 - Aggravates lung conditions - asthma, chronic bronchitis
 - Heart disease – irregular heartbeat, nonfatal heart attacks
 - Premature death in people with heart or lung disease
 - Affects healthy children and adults - Coughing, wheezing, decreased lung function
- Recently identified wood smoke health effects²
 - Aggravates lung and heart disease, reduces lung function
 - Reduces blood's ability to clot
 - Increases hospital admissions, 10% increase in hospital admissions among children
 - Increases substances in body that leads to cardiovascular and pulmonary inflammation
 - 70% of wood smoke can re-enter a home or neighboring residences
 - Children more likely to be harmed – increased hospital admissions and decreased memory function and scores on intelligence tests
- ARB estimates that if Sacramento area met PM_{2.5} health standards, the benefits would be
 - 330 avoided premature deaths
 - Economic value of 3 billion dollars per year

¹ National Morbidity, Mortality, and Air Pollution Study; USC Children's Health Study; Harvard's Six Cities Study; American Cancer Society Study of PM and Mortality; Fine PM and Mortality in 20 Cities; Air Pollution and Cardiovascular Events

² Seattle Health Effects and PM and Black Carbon; Copenhagen Particle Source and Hospital Admissions; Seattle Lung Function and Airway Inflammation in Woodsmoke-Impacted Urban Area; Sweden Exposure to Woodsmoke Particles in Healthy Humans

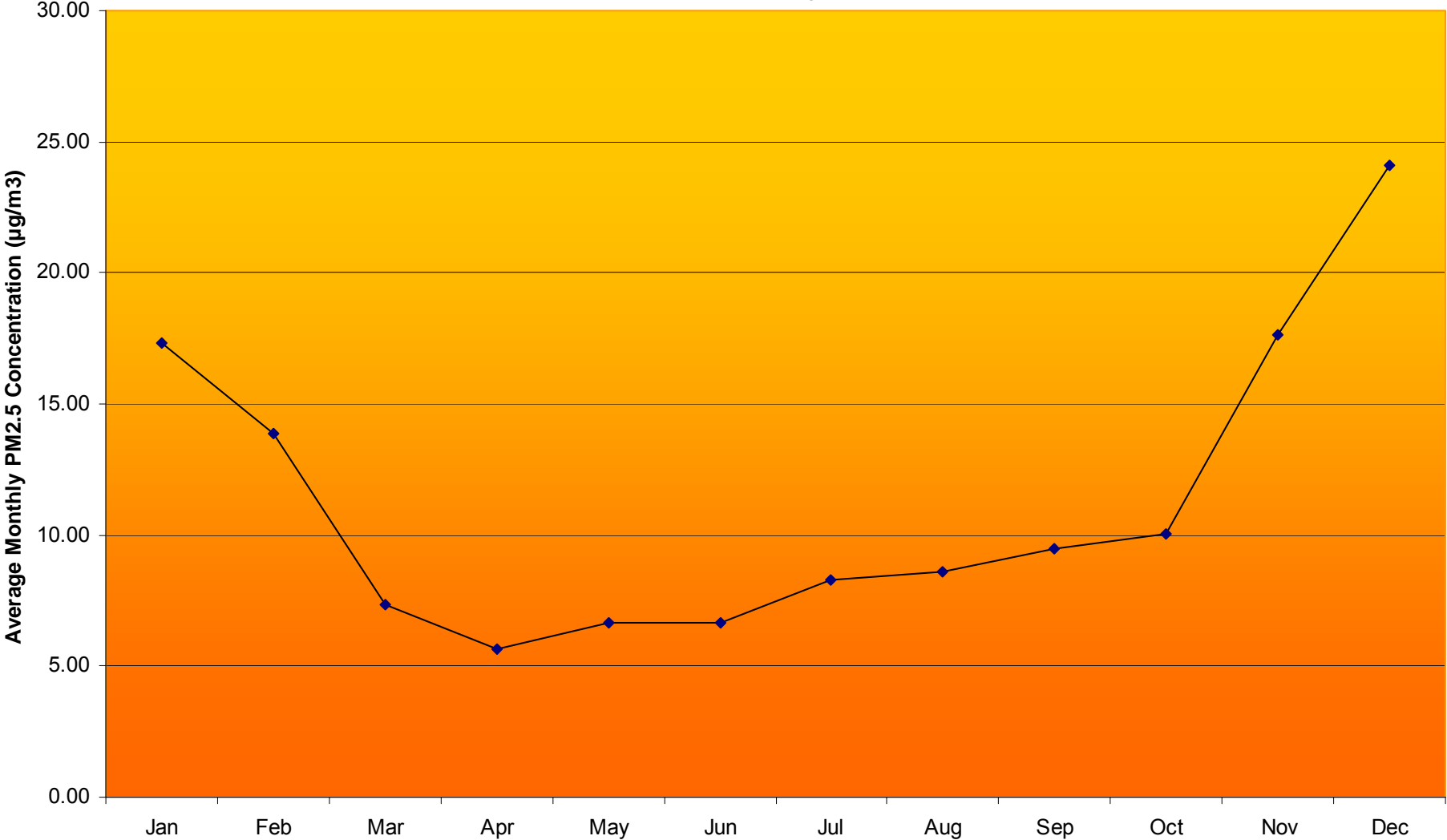
Transport Analysis

- PM2.5 Concentrations at
 - Monitoring Sites (Del Paso Manor, Bruceville & Folsom)
- Two Methods: MM5/CAMx & TEAK
- Urban Sacramento contributes shows Del Paso is most impacted by urban Sacramento Region (79%)
- Rural Sacramento Regions significantly affects Bruceville PM2.5 Concentrations
- No Burn days in rural areas on high PM days reduces localized areas of poor air quality (MM5/CAMx)

	Del Paso	Bruceville	Folsom
Urban Sacramento	79%	26%	53%
Rural Sacramento	3%	26%	2%

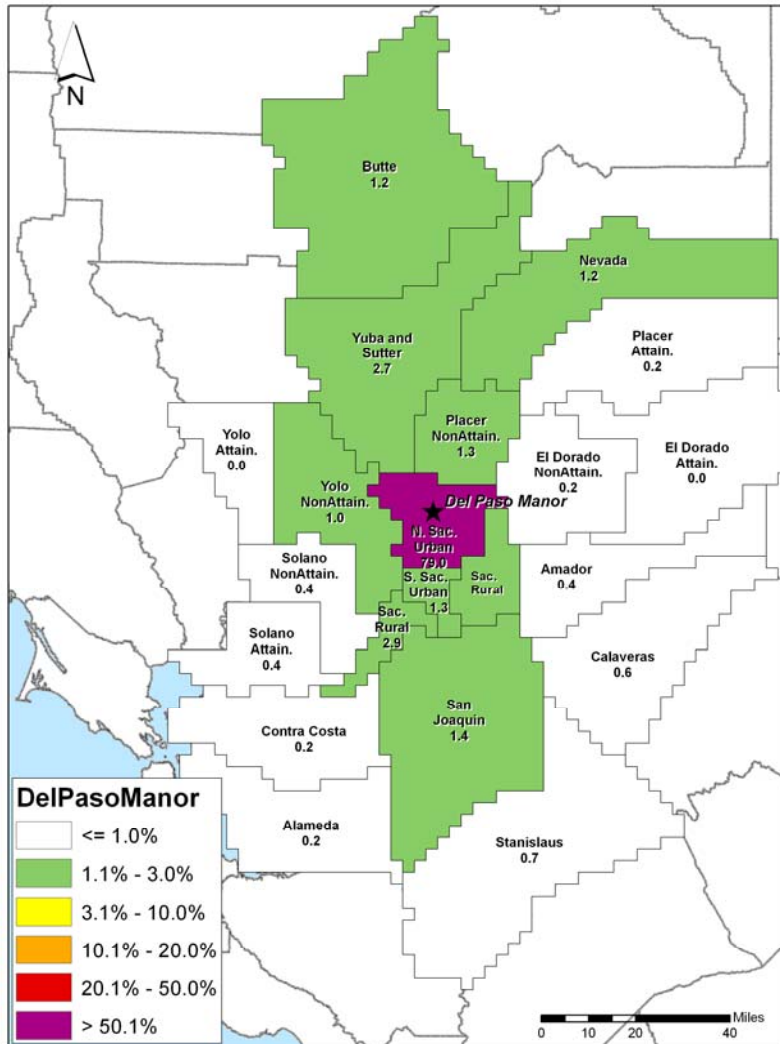
Seasonal PM2.5 Pollution

PM2.5 Levels Are Highest in November, December, January and February

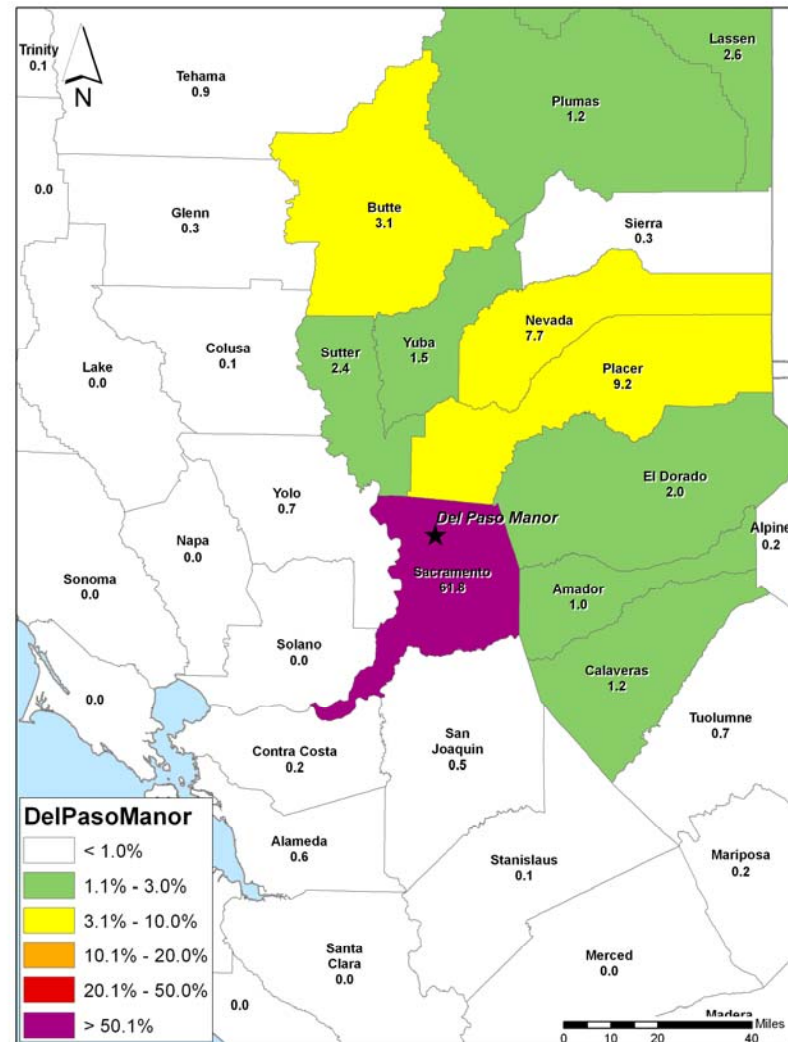


Del Paso Manor – Findings

MM5-CAMx (2000-2001)

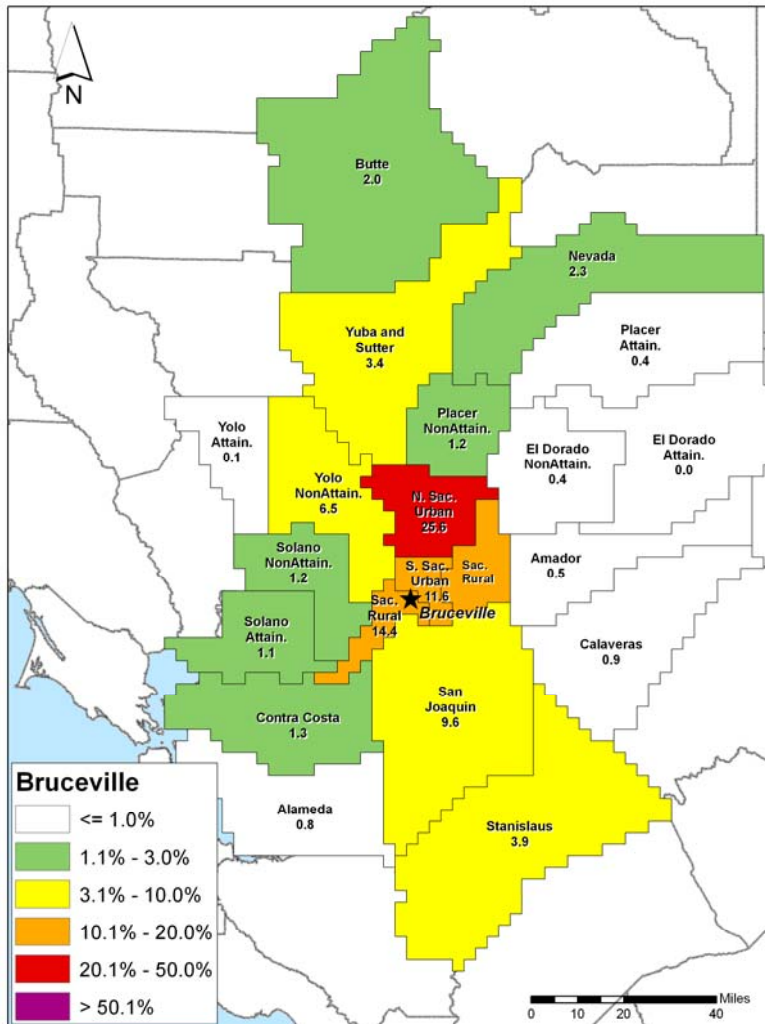


TEAK (2007-2009)

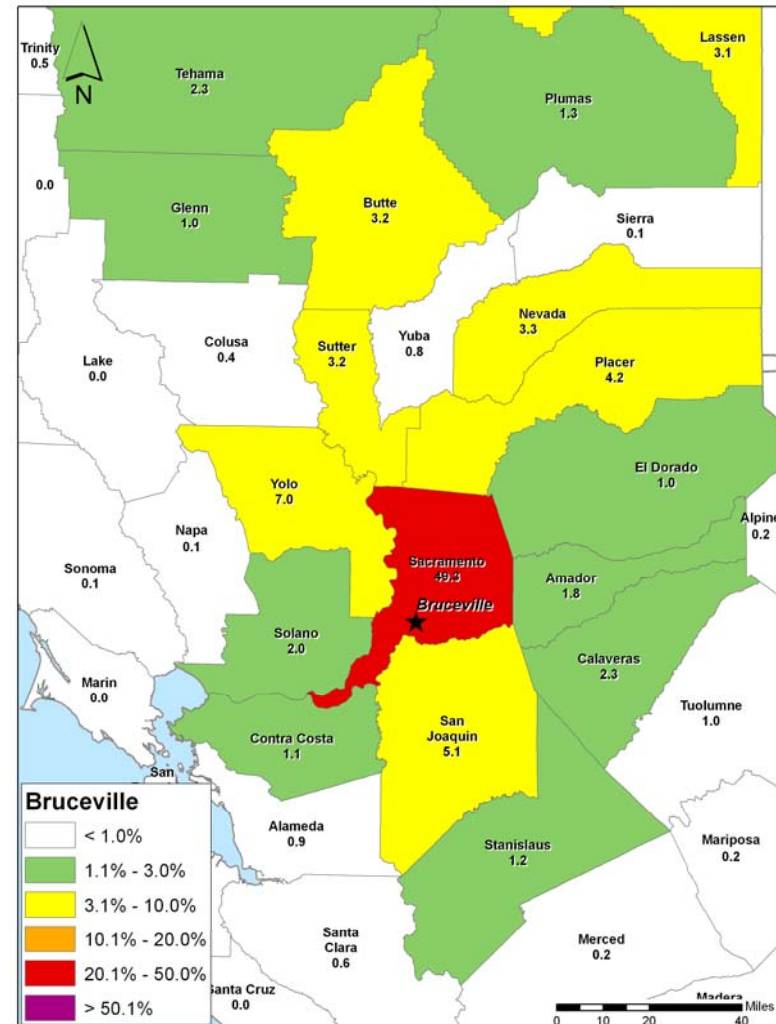


Bruceville – Findings

MM5-CAMx (2000-2001)

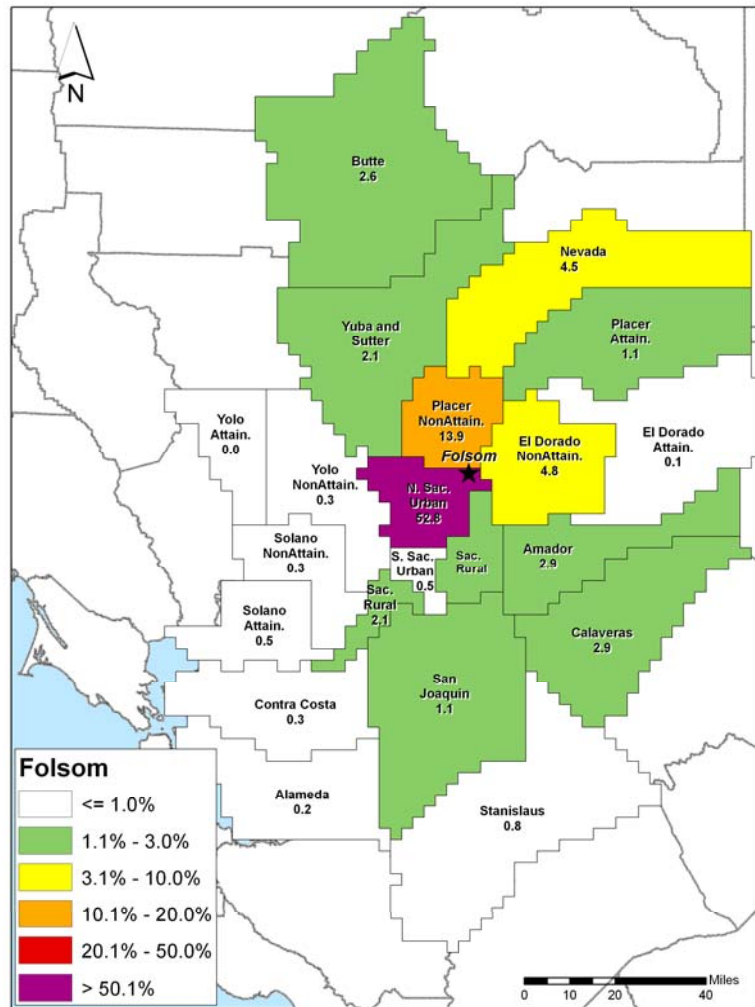


TEAK (2007-2009)

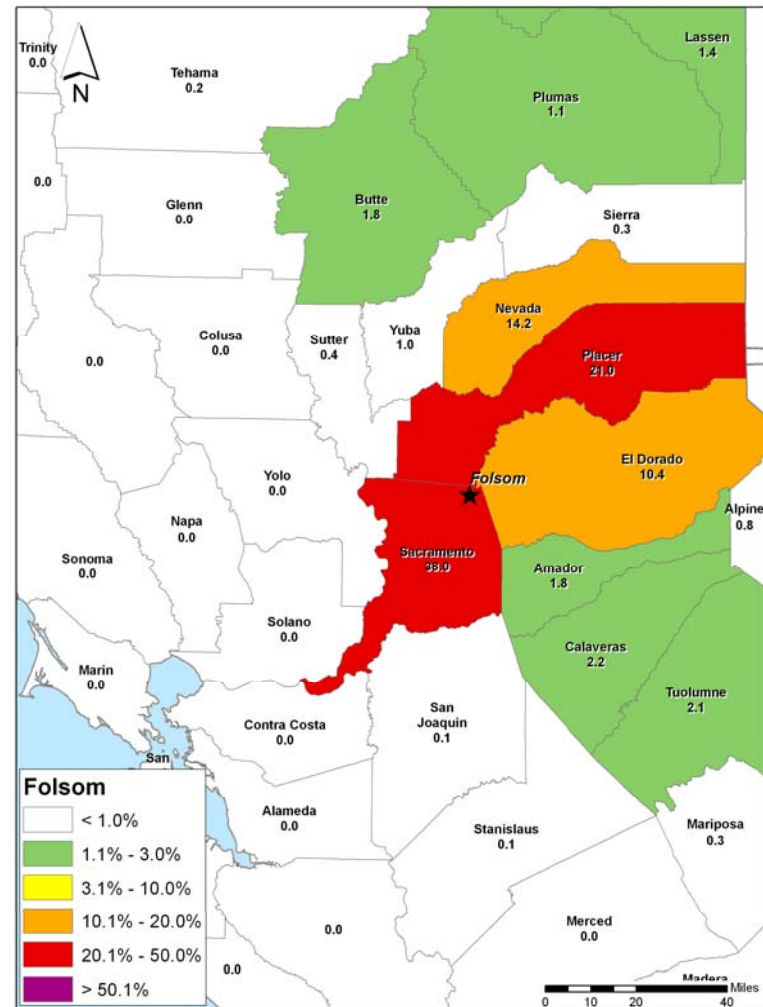


Folsom – Findings

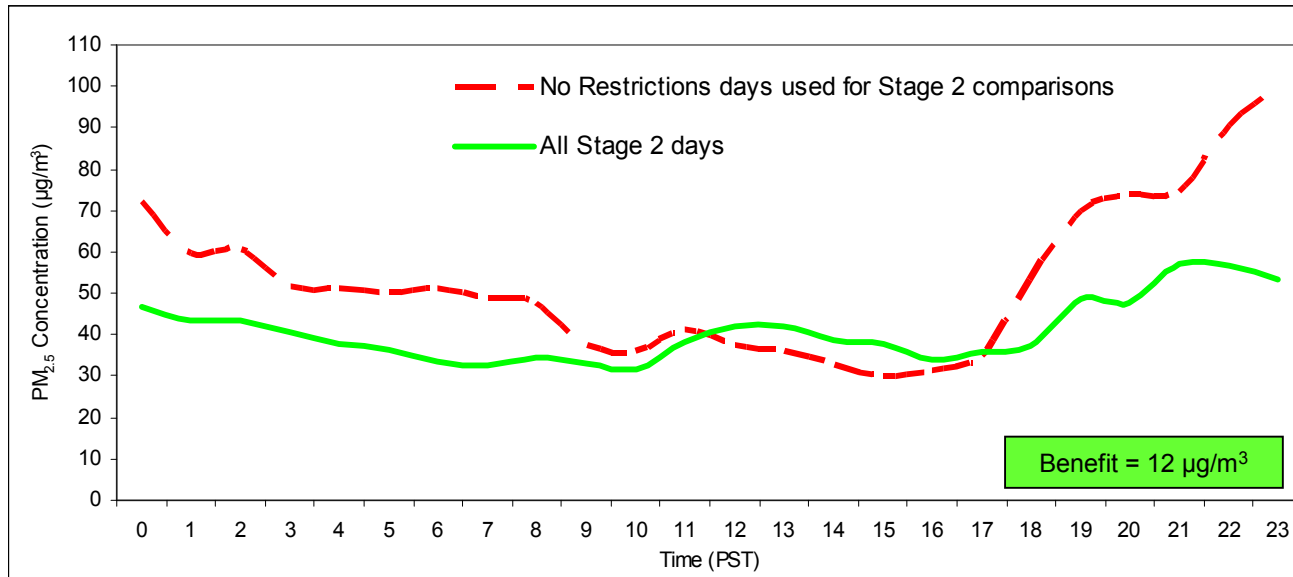
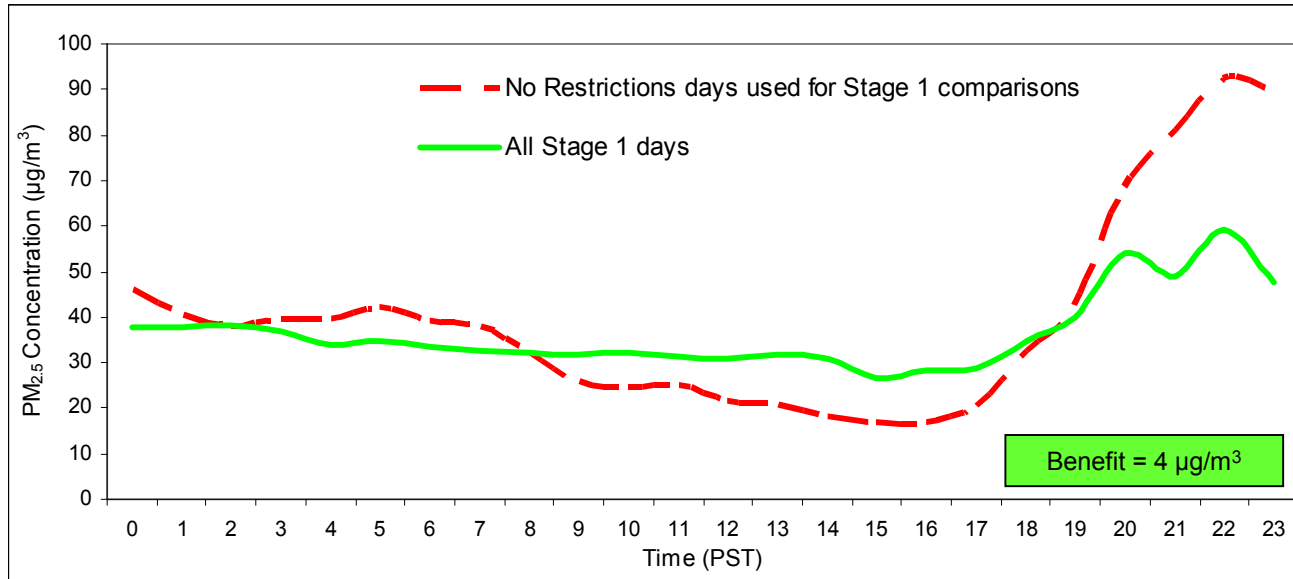
MM5-CAMx (2000-2001)



TEAK (2007-2009)



Monitor Diurnal Concentration

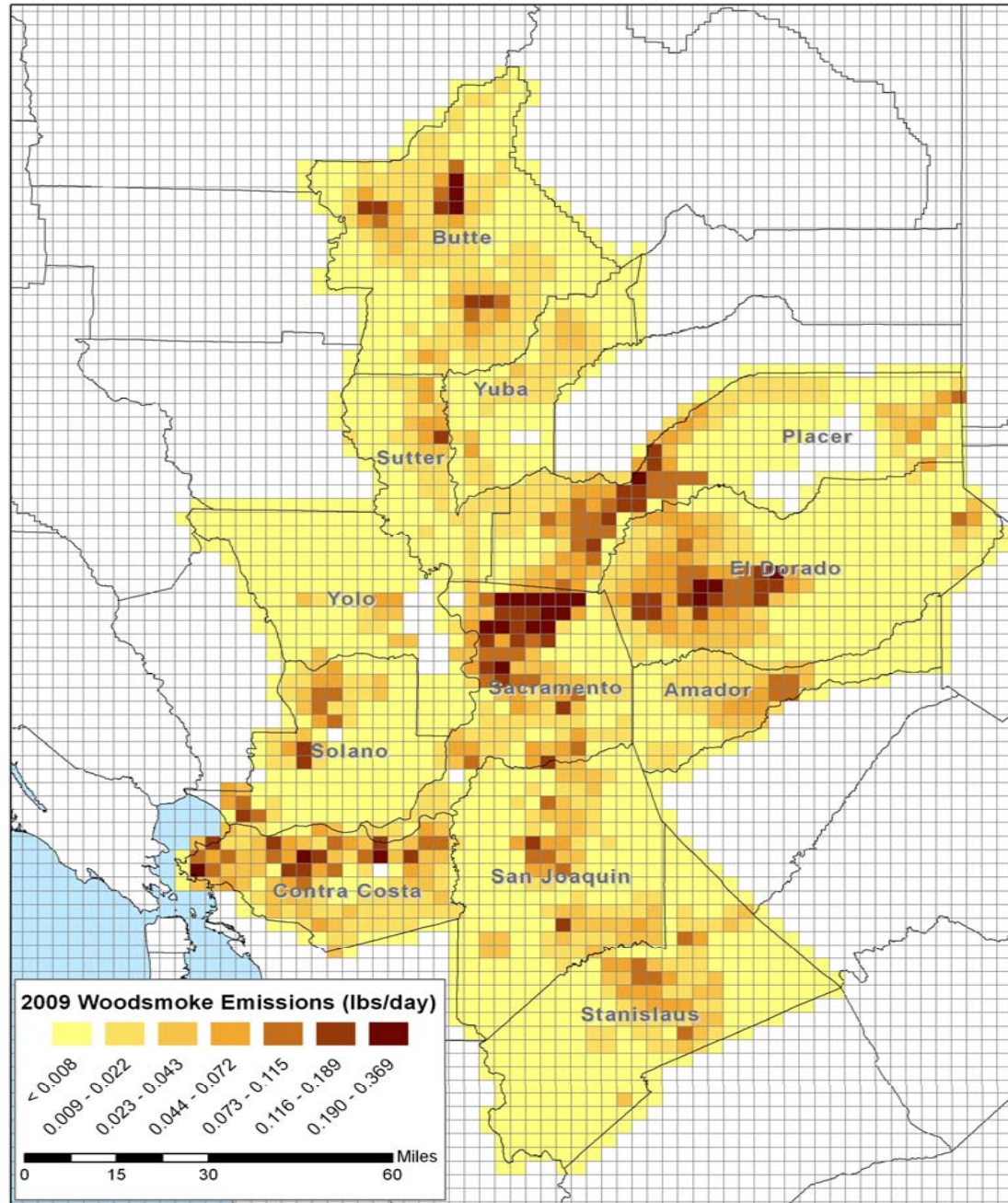


Socioeconomic

- ERG Analysis
 - Price Increase or No Price Increase Scenarios
 - Potential Loss in Employment (Assumes 100% of wood sold by affected industry)

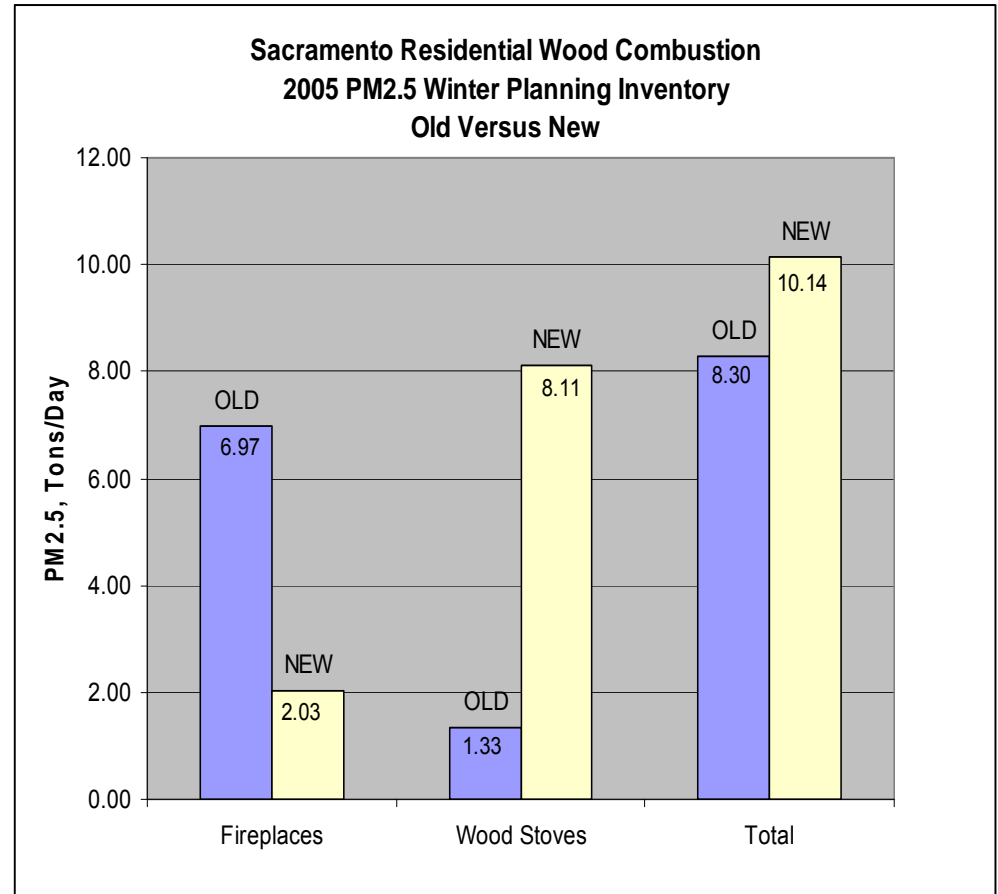
Scenario	Recommended Change	Option A	Option B	Contingency
Price Increase (No Job Loss)	4.6%	8.7%	14.0%	34.1%
Cost to Consumers (If Price Increase)	\$11-\$18 per season	\$22-\$35 /season	\$35-\$56 /season	\$84-\$138 per season
Job Loss – Wood Retailers (If No Price Increase)	3	5	9	21
Impact to Business	\$577,781	\$1,137,064	\$1,620,987	\$4,211,867

Gridded Emissions



New Emission Inventory Info & Wood Usage Rates

- CARB Revised Methodology
- Update Usage Rates (cords /year)
 - Fireplaces
 - Aesthetic – 0.069
 - Heating – 0.656
 - Wood Inserts
 - 1.2 cords/year
 - Wood Stoves
 - 1.5 cords/year



Per Device Emission Rate & Annual Emissions

Device Type	Emission Factor (lbs PM2.5/ton fuel burned)	PM2.5 per device per year (lbs/year)
Fireplace – Aesthetic Heating	23.6	3
	23.6	24
Uncertified wood stove	30.6	71
Catalytic wood stove	20.4	47
Non-Catalytic wood stove	14.6	34
Uncertified wood insert	30.6	57
Catalytic wood insert	20.4	38
Non-Catalytic wood insert	14.6	27
Pellet stove	3.06	6

Number of violations at each monitoring station last season

Monitor Station	Violations (Days over the health standard) 2007-2008 / 2008-2009
Del Paso Manor	12 / 20
Bruceville	4* / 6
Folsom	2 / 3

*** 12/17/07 over health standard at
Bruceville but not at Del Paso Manor**