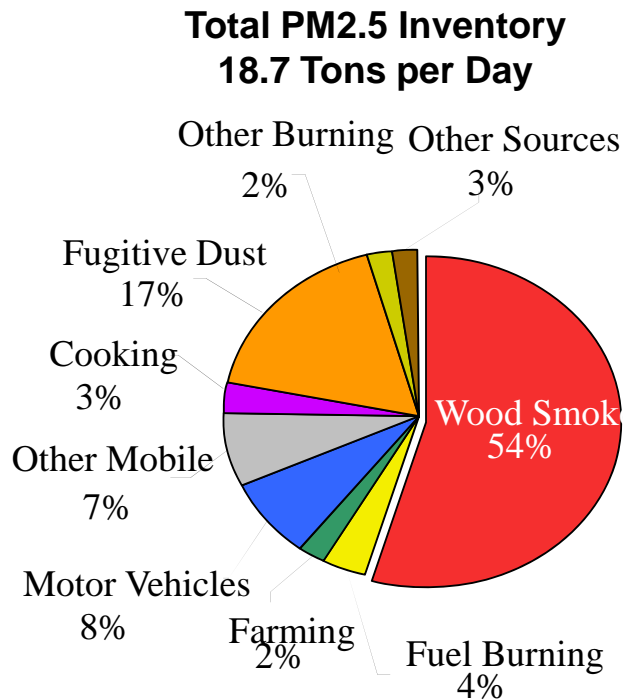


# SMAQMD Wood Smoke Program



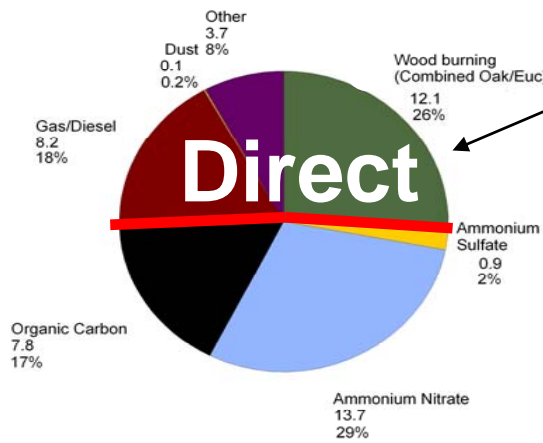
# Overview

- PM2.5 exceeds health standards
  - Designated nonattainment 12/14/09
  - 06-08 Design Value = 51.8  $\mu\text{g}/\text{m}^3$
  - 07-09 Design Value = 49  $\mu\text{g}/\text{m}^3$
- Highest PM concentrations in wintertime
- Wood smoke is single largest source of wintertime particles



## Observed Total PM<sub>2.5</sub>

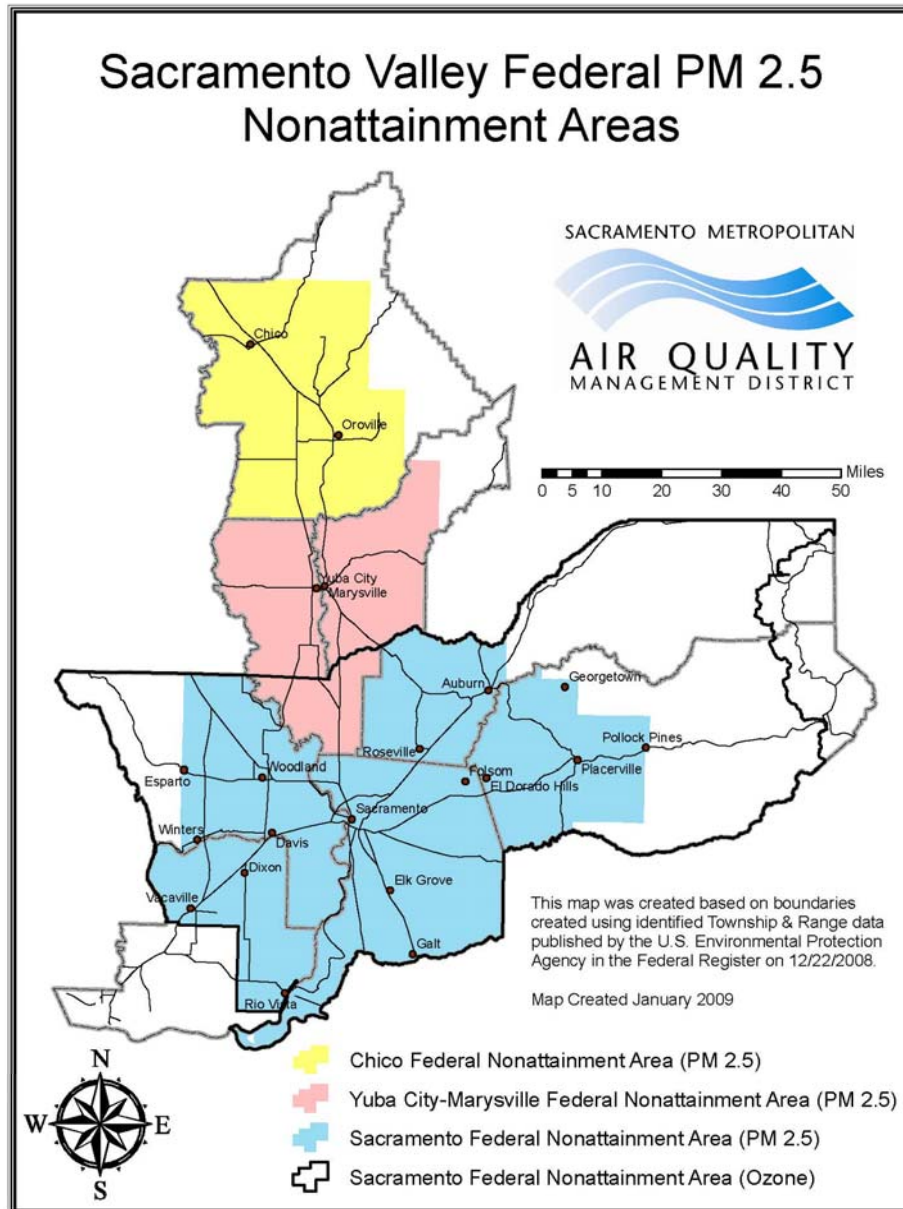
Average Source Contribution Estimate ( $\mu\text{g}/\text{m}^3$ ) for no-restriction days from 2005-2007 that were matched to Stage 1 and Stage 2 days (because of similar meteorology between days)



**Wood burning**  
**50% of Direct**  
**26% of Total**

Average Total Concentration = 46  $\mu\text{g}/\text{m}^3$

# Nonattainment Area



# Attainment Plan Development Timeline

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Emission Inventory

Modeling

Control Strategies

Workshops & Public Hearings

← Total SIP Development Time ~2 years →

# Integration of State/Local Actions

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- Plans adopted by local District first
  - Assemble plan with local measures
  - State reductions integrated at local level
  - Transportation planning agencies provide travel data and new measures
  - Local SIP adoption with attainment demonstration relying on state reductions
- Air Resources Board (State agency)
  - Determine if plan meets Clean Air Act requirements
  - Approve commitments to achieve emissions reductions
  - Ensure enforcement

# Emission Inventory

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- States/Districts are updating inventory categories

Paved Road Dust

Unpaved Road Dust

Mobile Sources

Wildfires/Prescribed Burning

Residential Wood Combustion

Construction & Demolition

Windblown Dust

Ammonia

Agricultural

Managed Burning

- Residential Wood Combustion

- Updated to reflect more recent survey data, emission factors, and calculation approaches
- Uses local residential wood combustion survey data
  - BAAQMD – 2007
  - OMNI – 2003
  - OMNI – 2006
  - PCAPCD – 2007
  - SJVUAPCD – 2008
  - SMAQMD – 2007
- Looking at Duraflame statewide sales data

# Air Quality Modeling

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- Grid-based photochemical modeling to simulate chemistry and meteorology to predict PM<sub>2.5</sub> concentrations
- Models being used:
  - Air Quality – CMAQ (US EPA Community Multi-Scale Air Quality Model)
  - Meteorology – MM5 (Pennsylvania State University/ National Center for Atmospheric Research Mesoscale Model)
- Periods to be modeled
  - Three full years of daily modeling
  - Looking at model performance currently to determine what three year period
  - Control profiles for already implemented measures will be applied to the modeling to determine if any remaining reduction sare needed

# Three Prong Approach to Wood Burning Efforts

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- Incentive programs
  - August 2006 – started incentive program to clean up existing dirty fireplaces and wood stoves
  - May 2008 - partnered with the Community Resource Project to implement a low income assistance program
- October 2006 – Board adopts Rule 417 - all new installations must be clean
- October 2007 – Board adopted Rule 421 – Curtailment on poor air quality days
- September 2009 – Board amended Rule 421 lowering curtailment threshold levels

# Wood Stove/Fireplace Voucher Program

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- Program approved June 2006
  - August – September 2006 (Pilot Program)
  - February – May 2007
  - September 2007 – March 2008
  - September 2008 – June 2009
  - September 2009 - ongoing
- Funded through fees collected for SEED and CEQA mitigation
- Participating Retailers implement
  - Price reduction applied at time of sale
  - Validate old device is removed or destroyed
- SMAQMD does random audits/inspections

# Current Incentive Levels

	Environmental Justice Areas	Other Areas
Fireplace/Uncertified wood to gas	\$750	\$450
Certified wood or pellet to gas	\$500	\$350
Uncertified wood to pellet	\$250	\$250
Uncertified wood to certified wood	\$150	\$150
Removal of wood or pellet	\$150	\$150
Fireplace to gas logs	\$425	\$300
Fireplace/Uncertified or Certified Wood/Pellet to electric	\$425	\$300

# Program Results (2/23/2011)

	Environmental Justice Areas	Other Areas
Completed Projects = 3939	1177	2762
Monies reimbursed = \$1,517,430	\$590,176	\$927,254
<b>Old Dirty Devices</b>		
Fireplaces = 3633	1054	2579
Uncertified wood = 296	118	178
Certified wood/pellet = 10	5	5
<b>New Cleaner Devices</b>		
Gas stove/insert = 2064	605	1459
Gas logs = 1213	319	894
Pellet = 359	120	239
Wood stove/insert = 258	119	139
Electric = 39	12	27
Removed = 6	2	4

# Low Income Assistance Program

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- Program implemented through partnership with Community Resource Project
- Reimburse full cost of unit/installation
- Qualification based on federal low income guidelines
- Encouraged to replace with gas unit, but certified wood unit is a choice

# Low Income Program Results (2/23/2011)

	Environmental Justice Areas	Other Areas
Completed Projects = 172	128	44
Monies reimbursed = \$386,018	\$288,614	\$97,404
<b>Old Dirty Devices</b>		
Fireplaces = 171	127	44
Uncertified wood = 1	1	-
<b>New Cleaner Devices</b>		
Gas stove/insert = 147	110	37
Wood stove/insert = 25	18	7

# Rule 417 Requirements

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- All new permanent installations of wood burning appliances must be EPA certified or other specified low emission device
  - Applies to indoor and outdoor installations
- Prohibits the sale and installation of used wood burning appliances, unless EPA Certified or rendered permanently inoperable
- Requires distribution of educational information about wood burning by sellers
  - Health effects of wood burning
  - Proper operation, maintenance and fuel selection
  - Weatherization methods
- Advertised “seasoned” or “dry” wood must contain 20% moisture content or less
- Prohibits burning of garbage and other non-fuel items

# Rule 421 Requirements

- In effect November 1<sup>st</sup> 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](http://www.airquality.org) or [www.SpareTheAir.com](http://www.SpareTheAir.com)
  - E-mail or text message through Air Alert at [www.SpareTheAir.com](http://www.SpareTheAir.com)
  - Sacramento Bee weather page
  - Radio and TV weather broadcasts

# Rule 421 Enforcement

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- Violations
  - when wood smoke is visible on a no-burn day
- Inspectors not on private property
  - Notice of violation mailed to resident
  - Photos if possible
- Penalties
  - First time violations
    - \$50 penalty fee or
    - Free compliance school & pass test (on-line or mail in)
  - Subsequent violations
    - Board approved mutual settlement program

# Rule 421 Assessment

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- Following second year of program, performed studies to assess benefits of Rule 421
  - 92% awareness of requirements
  - 57% to 70% emission reduction on No-burn days
  - Up to 23% ( $12 \mu\text{g}/\text{m}^3$ ) air quality improvement
  - 40% fewer days above health standard
- Increased benefits from this rule will reduce the level of commitments to adopt other, more costly regulations in 2012 plan
- September 2009, Board adopted amendments to Rule 421 to lower the curtailment thresholds
- Re-assessment of benefits from rule will be done following 11-12 season for inclusion in 2012 plan

# Rule 421

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- One of most difficult rules to get adopted
  - Held 5 public workshops and received over 200 comments on rule amendment proposal
- Working with partners
  - HPBA & Retailers
  - Realtors
  - Chamber of Commerce
  - Health Officials
    - School Nurses
    - County Health Officer
  - Breathe California
- Health Effects – especially relating to children

# Frequently Received Questions

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- 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

# No Burn Days Called

	06-07 Season	07-08 Season	08-09 Season	09-10 Season	10-11 Season
Discouraged	N/A	18	28	35	25
Stage 1	N/A	8	10	9	23
Stage 2	N/A	0	28	12	3
Days >35 $\mu\text{g}/\text{m}^3$	36	14	20	14	4

# Enforcement Statistics

	07-08 Season	08-09 Season	09-10 Season	10-11 Season
Sole Source Waivers	33	96	81	39
Medical Waivers		4	3	1
Financial Hardship Waivers	9	50	62	55
Denied Waivers		3	8	3
Violations observed	21	211	136	112
Smoke complaints received on no burn days	27	228	117	72
Total smoke complaints received	114	285	172	111

## Enforcement Statistics Violation Resolution

	08-09 Season	09-10 Season	10-11 Season (To Date)
Violations Issued	212	140	114
Violations Resolved:	181	129	77
Written Exam Received	108	81	56
Online Test Taken	22	21	14
Night Course Taken	1	N/A	N/A
Paid Fine	9	6	1
No further action/Rescinded	40	19	5
Violations Issued Second Offense	1	4	2
Paid Fine (\$360)	1	2	1

# Rule 421 Costs to Implement

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- Sonoma Technology - \$90,000/year
  - Forecasting
  - E-alerts (7100+)
  - Twitter
  - Special studies or forecast fine tuning (if funding available)
- Contractor Outreach - \$105,000
  - No paid advertising (add \$45,000 if paid advertising)
  - Public relations/Partner development – (2200+ partners)
  - Brochures
  - Newspaper/ articles (free)
- Staff costs
  - Support of forecasting program – 3 staff spend 0.5 – 1 hour/day
  - Support of outreach - \$50,000
- No Burn day
  - Week day - 6 inspectors spend 1-3 hours/day surveillance/responding to complaints
  - Weekends Stage 2 only – 2 inspectors spend 3 – 8 hours/day surveillance/responding to complaints

# Potential Additional Control Measures

Hope is 417/421/Incentives will lead to attainment

**Agriculture**  
Unknown

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

**Unpaved Roads**  
\$6.15/lb

**Chipping/Grinding**  
Unknown

**Ag, Non-Ag & Prescribed Burning**  
Unknown

**Paved Roads**  
\$1.43/lb

**Efficiency of control devices**  
Unknown

**Bulk Material Storage**  
\$14.12/lb