



# Voluntary Residential Wood Smoke Reductions Initiative

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# Presentation Overview

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## **Voluntary Residential Wood Smoke Reduction Initiative**

- **Problem - Why do we care?**
- **Challenges**
- **What can we do? ...Major components**
- **Potential Benefits/Metrics**
- **Partners**



# Residential Wood Smoke - Why do we care?

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- **Fine particle pollution (PM2.5)** - ~5.5 % (420,000 tons) of total PM2.5 emissions
  - PM2.5 is linked:
    - to premature deaths from heart and lung disease
    - aggravation of heart and lung diseases
    - and possibly lung cancer deaths, infant mortality & developmental effects (e.g., low birth weight)
  - States have recommended that EPA designate 243 counties as non-attainment



# Residential Wood Smoke

## Why else do we care?

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- **Toxics – Polycyclic Aromatic Hydrocarbons**

- Contributes ~ 22% of all 7 carcinogenic PAHs, e.g., benzo(a)pyrene

- **Indoor Air**

- Old wood stoves are often poorly sealed
- Improper ventilation of woodstoves and fireplaces

- **Fire Safety**

- Creosote build up in chimney from old stoves is faster

# Conventional Wood Stoves



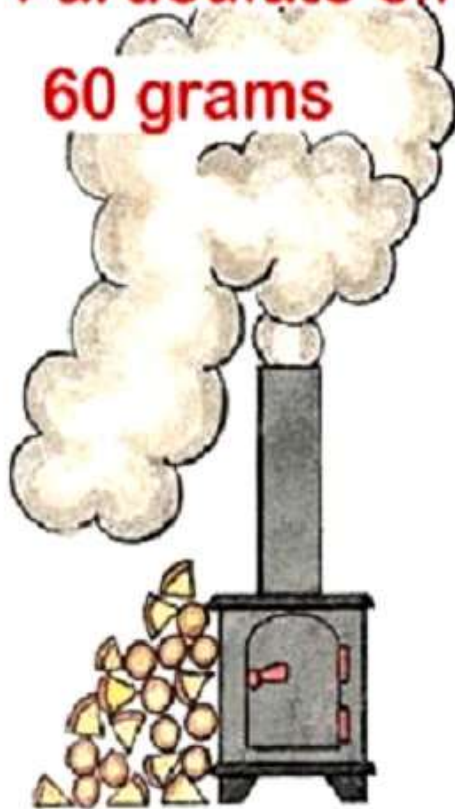
# Advanced Wood Stoves (EPA Certified)



# Compare old with new:

Particulate emissions in one hour:

60 grams



2-5 grams



**Overall Efficiency**

**40 – 50%**

**60 – 80%**

Graphic adapted from California EPA publications



# Challenges

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- New “cleaner” alternatives are expensive  
~\$1200 – \$2000 per stove (including installation)  
...Although to society, it is less than \$2000 per ton of PM2.5
- Old woodstoves last 30-40 years, 9 million of them
- Replacing old woodstoves is not amenable to a regulatory program...need creative/innovative approaches



# Residential Wood Smoke Reduction Initiative – What can we do?...Major Components

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- **Model Woodstove/Fireplace Changeout Program**
  - FY05: Model changeout programs: Libby, MT, Greater Pittsburgh & Dayton areas, document success, develop model
  - FY06: 6-8 changeout locations
  - FY07: National initiative, grow similar to diesel retrofit grant program
- **Facilitating funding for purchasing stoves for low income households**
- **Planning Woodstove Changeout Program “Lessons Learned” Workshop**
- **Guidance for Quantifying and Using Woodstove Changeout Emissions Reduction in SIPs**



# Residential Wood Smoke Reduction Initiative – What can we do?...Major Components

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## Other components include:

- Education and Outreach: Social Marketing
- Develop woodstove/fireplace website
- Develop “Ready-to-go” media outreach package
- Support ASTM fireplace consensus test method
- Evaluate impacts of outdoor wood boilers/furnaces
- Research emissions from firelogs (e.g., Duraflame)



# Residential Wood Smoke Reduction Initiative - Benefits

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## **This initiative will help:**

- Some areas attain the PM2.5 health standards
- Prevent other areas from slipping into non-attainment
- Address short term PM2.5 peak exposures to wood smoke
- Support community-based air toxics program
- Improve visibility in national parks and wilderness areas
- Support indoor air quality program efforts



# Residential Wood Smoke Reduction Initiative – Measuring results

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- Pre woodstove changeout monitoring, Nov., '05 – Feb. '06
  - PM2.5 and Toxics (Polycyclic Aromatic Hydrocarbons)
- Post woodstove changeout monitoring, Nov.'06 – Feb. '07
- Model air quality and health benefits at national scale
- Number of stoves changed out known at every location
- **Changing out 20 old woodstoves will reduce 1 ton of PM2.5 per year**



# Partners are critical to success

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**Some partners OAQPS is currently working with include:**

## Internal

- ORD, OECA, ORIA, Regions 3, 5 & 8

## External

- Hearth, Patio and Barbecue Association
- OH, PA, MT
- Chimney Institute of America
- National Fireplace Institute
- Canada's Burn It Smart Program
- Regional Planning Organizations

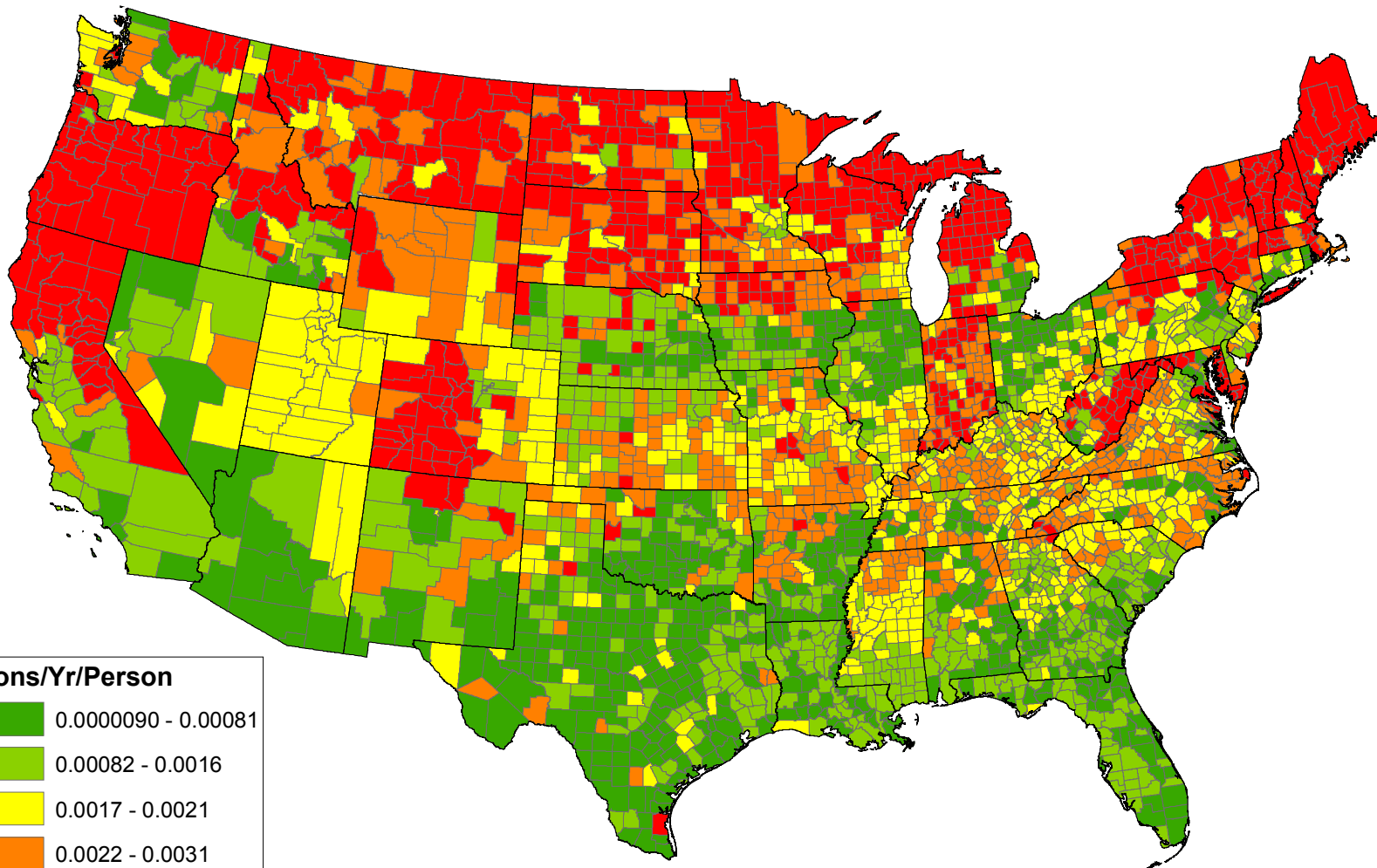
\*Interested in partnering with EPA, or want more information?

Contact Larry Brockman, [brockman.larry@epa.gov](mailto:brockman.larry@epa.gov), 919-541-5398.

# Outdoor Wood Boiler/Furnaces



# 1999 PM2.5 Primary Emissions from Residential Wood Combustion



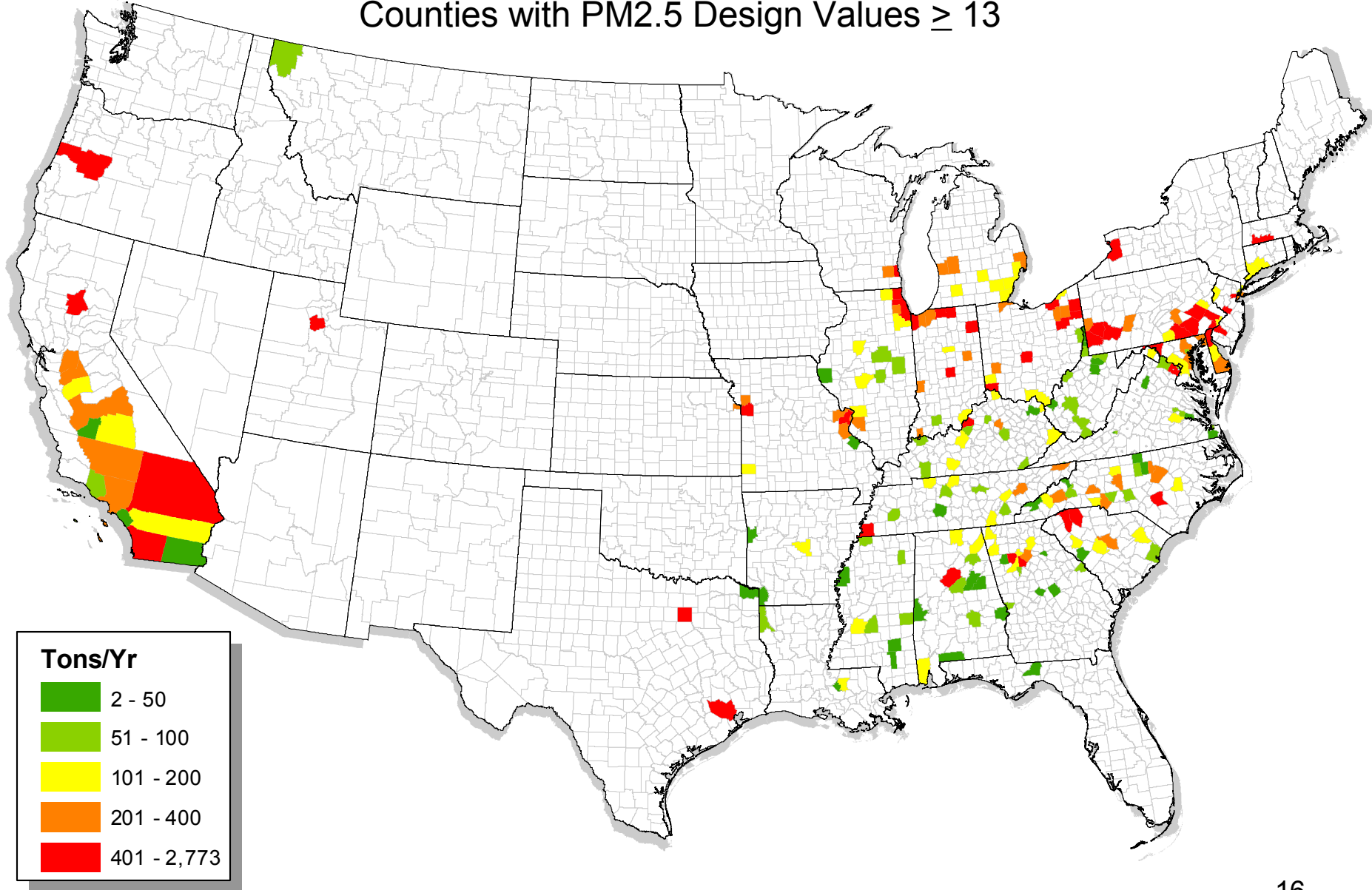
**Tons/Yr/Person**

Dark Green	0.0000090 - 0.00081
Light Green	0.00082 - 0.0016
Yellow	0.0017 - 0.0021
Orange	0.0022 - 0.0031
Red	0.0032 - 0.15

*Quantiles*

# 1999 PM2.5 Emissions from Woodstoves

Counties with PM2.5 Design Values  $\geq 13$



**% of Total Benzo(a) Pyrene (BaP) Emissions  
in Great Lakes Area = 51,000 lbs.  
1999 Data**

