

Introduction to Hearth Appliances, Nature and Magnitude of Residential Wood Smoke

Larry Brockman

Office of Air Quality Planning and Standards

RTP, NC

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Overview

- What's in Wood Smoke?
- Why Do We Care About Residential Wood Smoke?
- Why is Wood Smoke a Health Concern?
- Types of Appliances & Sources of Residential Wood Smoke
- EPA-Certified and Other Cleaner Heating Appliances
- EPA Voluntary Fireplace Program “Qualified” Retrofit Devices

What's in Wood Smoke?

“Ah, the sweet smell of wood smoke” - but what makes it so sweet?

- CO, NO_x, HC, VOCs, and Particle Pollution
- Toxics, including:
 - Benzene
 - Toluene
 - Aldehyde gases
 - Polycyclic organic matter
 - Methane and black carbon



Low stacks

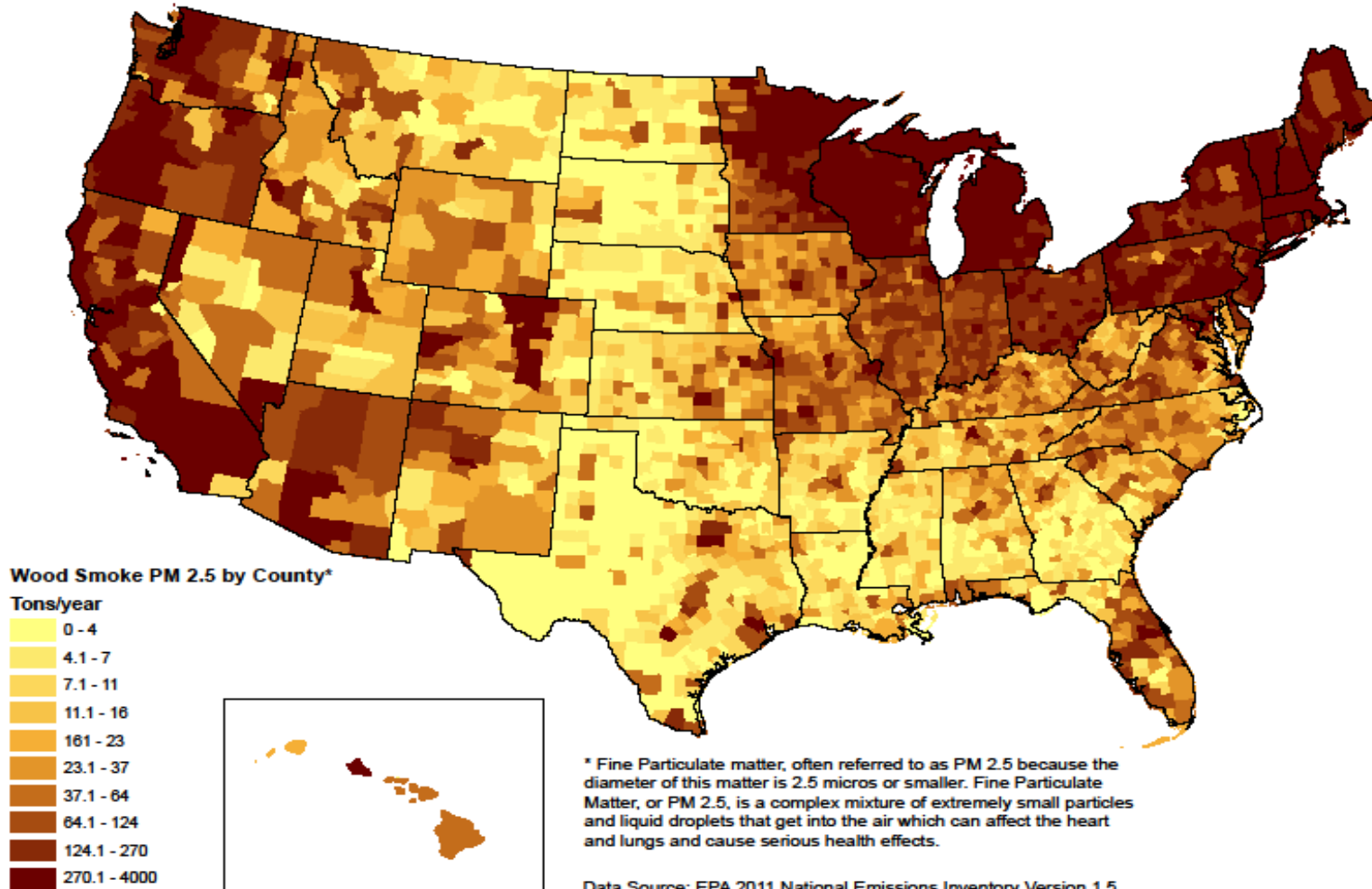


Poor dispersion

Why Do We Care About Residential Wood Smoke?

- Fine particle pollution (PM_{2.5})
~6% (315,000 tons) of total PM_{2.5} direct emissions
- ~ Five times more than all of these combined:
 - US petroleum refineries
 - Cement manufacturers
 - Pulp and paper plants

Wood Smoke Fine Particulate Matter by County



Why is Wood Smoke a Health Concern?

Wood Smoke: Hazardous Air Pollutants

Nationally, residential wood combustion accounts for about:

- 20 percent of total stationary and mobile polycyclic organic matter (POM) emissions
- 50% of the **area source cancer** risks
- 8% of the overall noncancer (respiratory) risk

*Source: 2011 NATA

Examples of Wood Smoke Complaints

Submitted on 03/2/2018

- Comment: My name is John Doe and I live in a mobile home park in Nevada county, Ca. A neighbor continuously burns green firewood in his wood stove and the entire area is covered with fumes from same. Several residents are experiencing severe breathing problems including 1 and soon to be 2 people having to go on oxygen. Nevada county has no rules or ordinances regarding wood smoke and are powerless to do anything. what can I do a.s.a.p.

Thank you

Submitted on 01/04/2016

- Comment: My neighbor burns wood as the only source of heat in his home. We live in a neighborhood where our homes are very close to one another. There are times when we can smell the wood burning in our home and there is smoke around his house. My son has asthma and we have had to visit the emergency room from an asthma attack due to the smoke being an irritant. Is there anything I can do?

Types of Appliances & Sources of Residential Wood Smoke

- Wood Stoves
 - Including fireplace inserts
- Fireplaces
- Hydronic Heaters
- Forced-air Furnaces
- Fire-pits/Chimeneas



Non EPA-Certified: Wood Stoves



Old 'conventional'
stoves built
before 1990



Non EPA-certified: Coal Stoves



Coal Stoves are not regulated by EPA

Non EPA-Certified: Masonry and Manufactured Fireplaces



Fireplaces are not regulated by EPA

Non EPA-Certified: Hydronic Heater



Non EPA-Certified: Forced Air Furnace



Non EPA-Certified: Chimeneas/Fire-pits



Fire-pits are not regulated by EPA

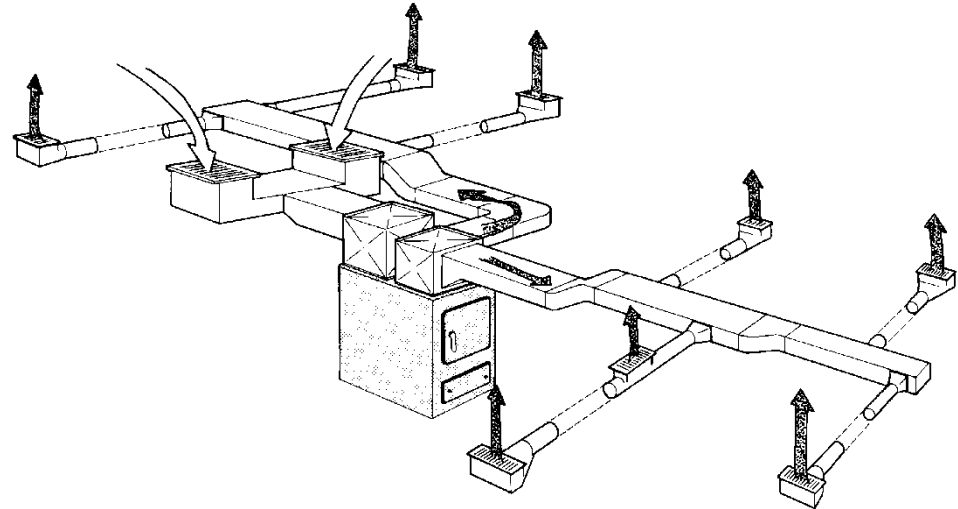
EPA-Certified Appliances



EPA-Certified Wood Pellet Stove



EPA-Certified Wood Burning Forced Air Furnace



Cleaner Heating Appliance: Gas/Propane Stove, Furnace, Heat Pump



Cleaner Heating Appliance: Ductless Heat Pump



EPA Voluntary Fireplace Program “Qualified” Retrofit Devices

Option for reducing emissions from masonry or factory built fireplace



Questions/Comments?