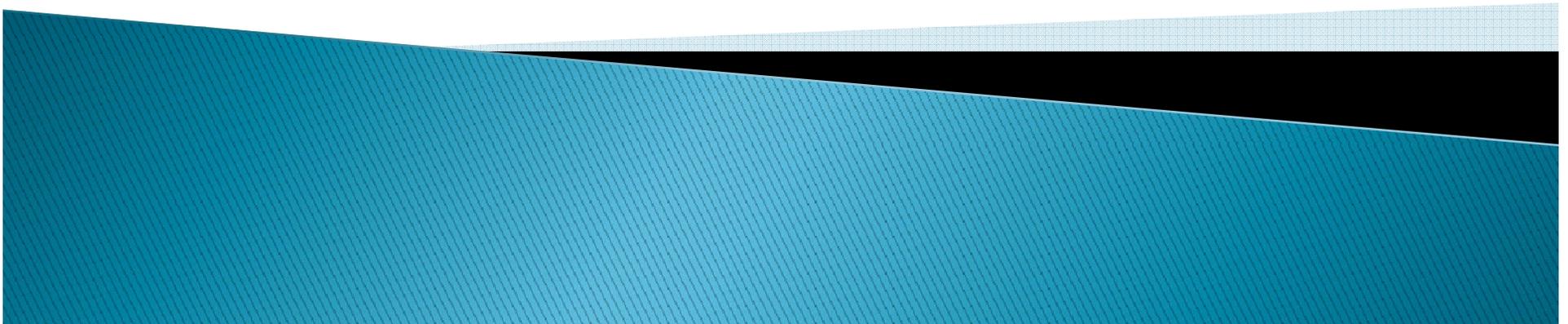


Revising the EPA's Residential Wood Combustion Access Tool to Develop a 2008 Emission Inventory

Roy Huntley, EPA
John Vanbruggan, EH Pechan & Assoc
Frank Divita, EH Pechan & Assoc



RWC Important Emission Source

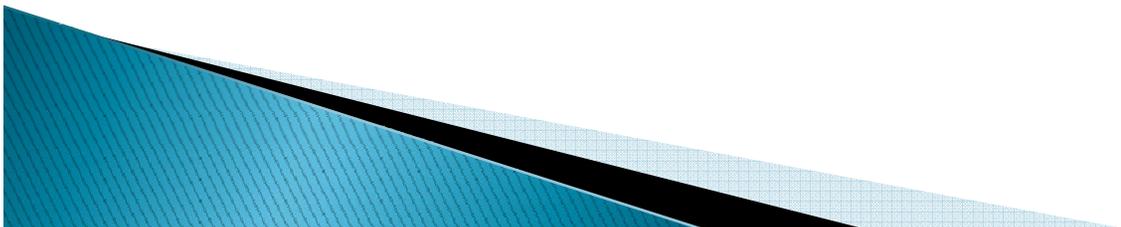
- ▶ RWC emits large amounts of fine particulate matter and air toxics that have been shown to contribute to poor human health, air quality, and visibility
- ▶ RWC PM_{2.5} emissions make up about 7% of the national emissions inventory on an annual basis
 - however local areas can experience high ambient concentrations during the heating season (~200 ug/m³, RWC contributions >90%)
 - NYSERDA report 8641





RWC Appliances Include

- ▶ Woodstoves
- ▶ Fireplaces
- ▶ Fireplace Inserts
- ▶ Pellet Stoves
- ▶ Indoor Furnaces
- ▶ Outdoor Hydronic Heaters (aka, Outdoor Wood Boilers)
- ▶ Firelogs



Fireplace



Freestanding Woodstoves



Insert



Pellet Stoves

733,000 operating units



Indoor Wood Furnace

311,000 operating units



Outdoor Hydronic Heater

360,000 operating units

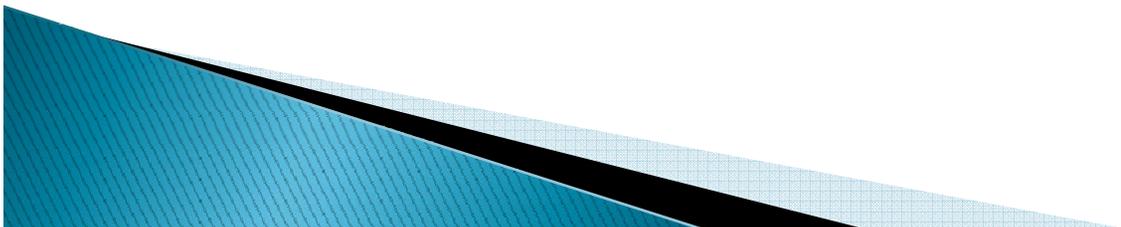


Firelogs (wax/sawdust)



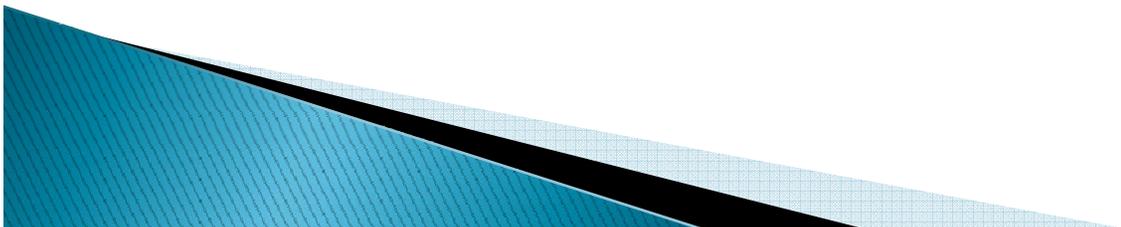
The EPA RWC Emission Estimation Tool

- ▶ First Created for 2005 NEI
 - More details on Tool, web cite
- ▶ MS Access – 6 tables of data, run query to create county level emission inventory
 - Not user friendly
- ▶ States, local agencies can input their own location-specific knowledge, improving the EI
- ▶ Relatively Easy to Update



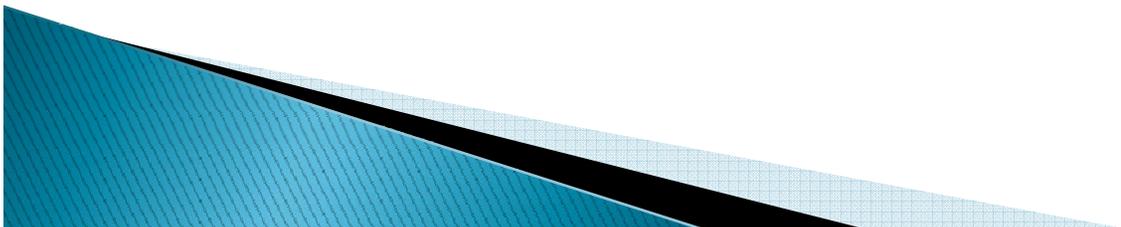
Why Did EPA Revise the Tool?

- ▶ Originally the Tool was built to estimate 2005 Emissions. EPA needed 2008 emissions.



Summary of Updates

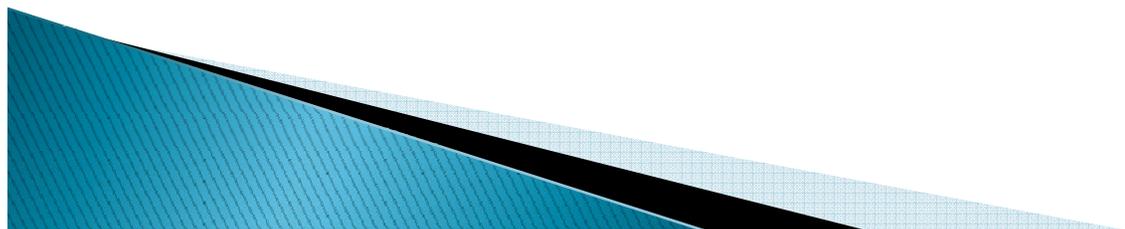
- ▶ Updated WS, FP, and Inserts Population with Latest AHS Data
- ▶ Updated OHH and Pellet Stove Population
- ▶ Updated County Housing Data with 2008 Housing estimates (adjusted for occupancy using 2000 occupancy data).
- ▶ Created new burn profile in selected New England Counties based on a combination of National defaults and VT profiles.
- ▶ Correction to pleasure burning ratio for fireplaces for West Census region.
- ▶ Updated Data in MN, MI, and WI to reflect Data in MN 2007–2008 Report.
- ▶ Updated Fireplace cordwood to firelog ratio

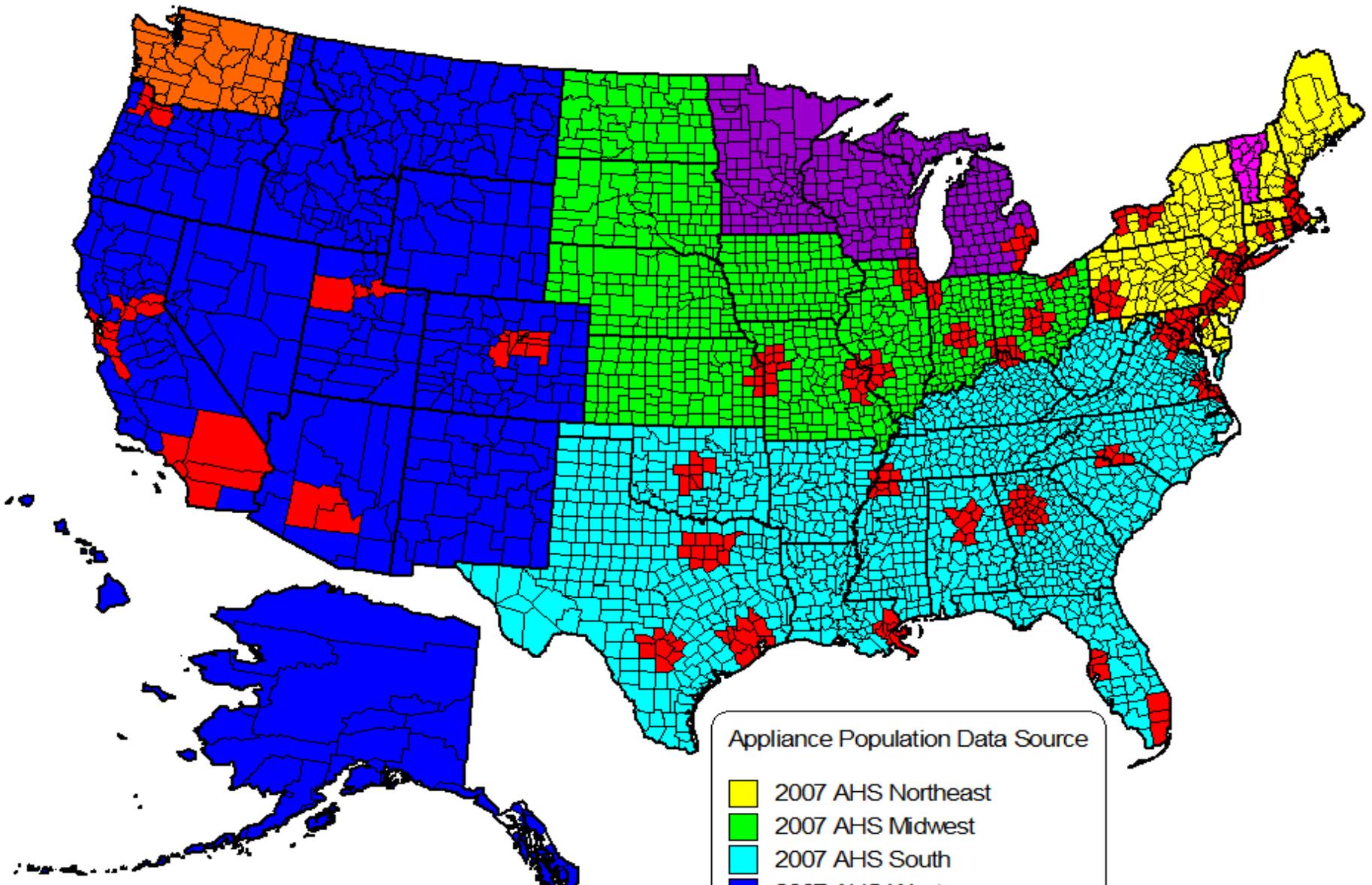


American Housing Survey

US Department of Census

- ▶ Updated Tool with latest Woodstove, Fireplace, and Insert Population Data
 - Main census region appliance profiles were updated with 2007 AHS data.
 - MSA appliance profiles updated with newer data where available.





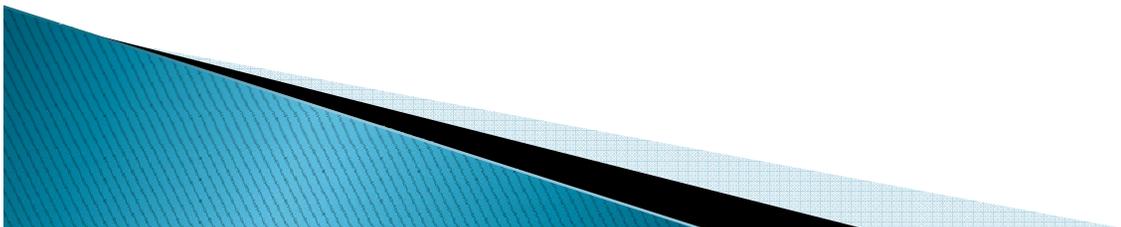
Appliance Population Data Source

- 2007 AHS Northeast
- 2007 AHS Midwest
- 2007 AHS South
- 2007 AHS West
- AHS MSAs
- WA 2001 WSU Survey
- MN Fuel Wood Report
- VT Draft Survey



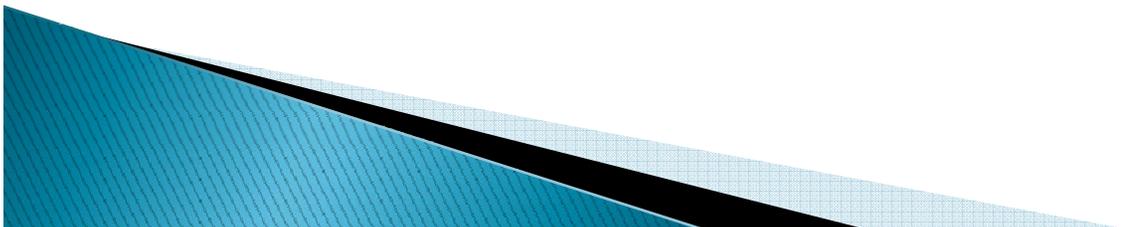
AHS Methodology Change

- ▶ In 2007, AHS Changed the way they report Categories of Heating
 - Prior to 2007, AHS reported Primary, Supplemental, and Parallel
 - In 2007, AHS reported Primary and Other
 - Previously supplemental -> secondary and parallel -> pleasure
 - Other now -> secondary
 - Pleasure burning no longer a separate category for woodstoves and inserts
 - Population of FP used for pleasure burning and firelogs were derived from data in table 2-7 of AHS.

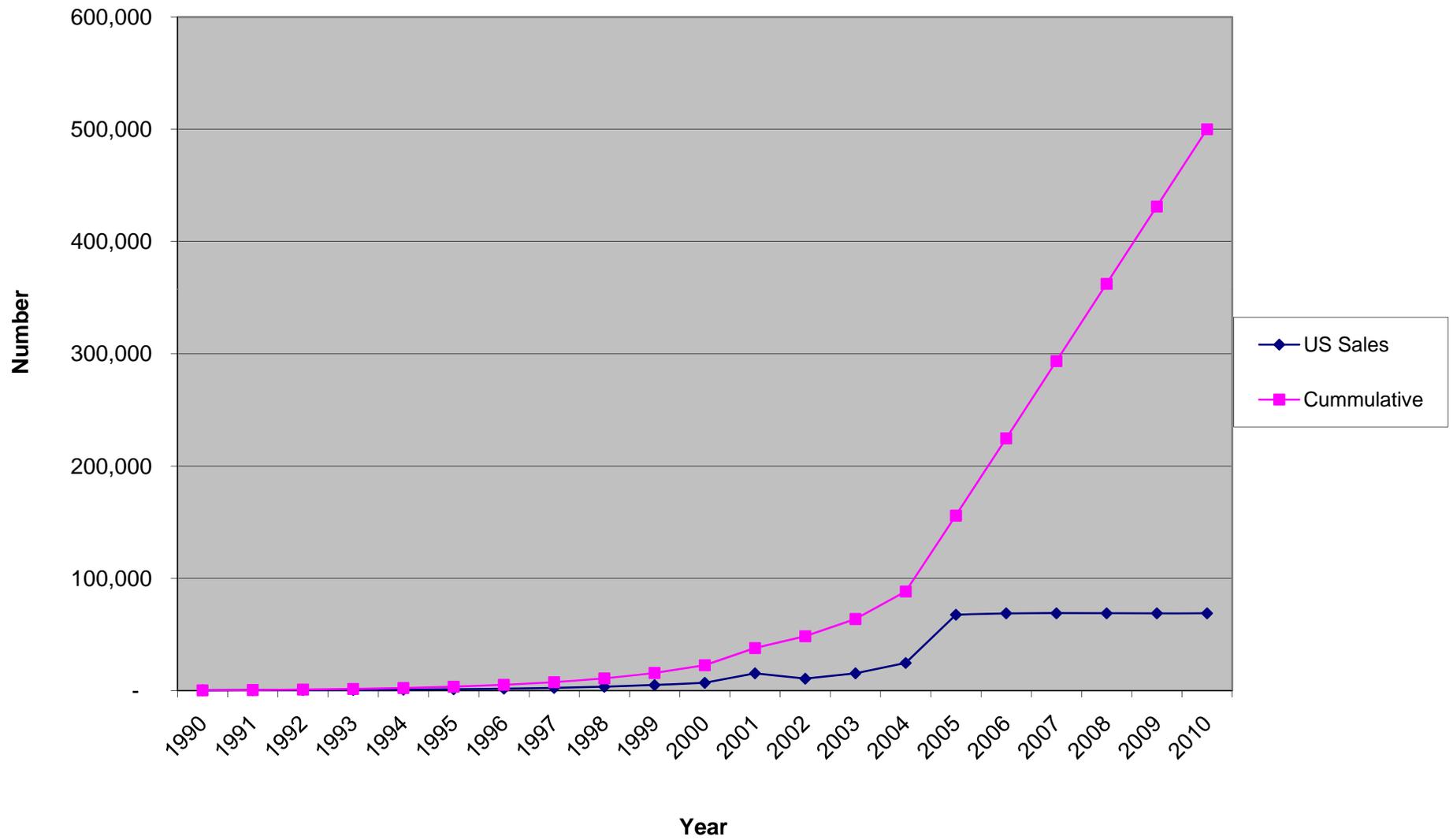


Updating OHH Population

- ▶ Not Available from AHS
- ▶ Recent Sales Data not Available
- ▶ Project Growth Based on Sales Data from Last Available Year (2005)
 - Assumed no growth in sales
 - Assumed all units sold in past still in service
- ▶ Allocated based on woodstoves in non-MSA counties (not a change)

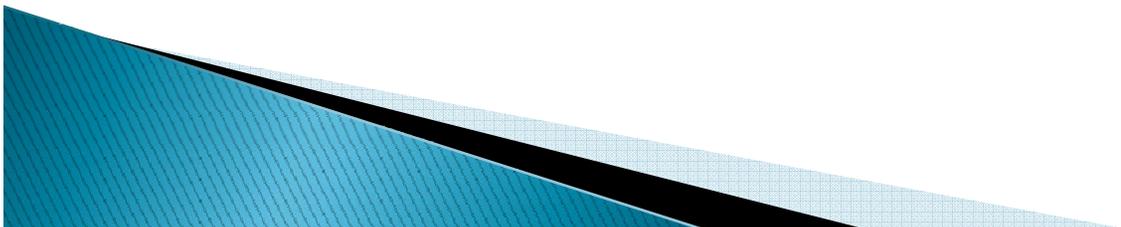


OWB Population



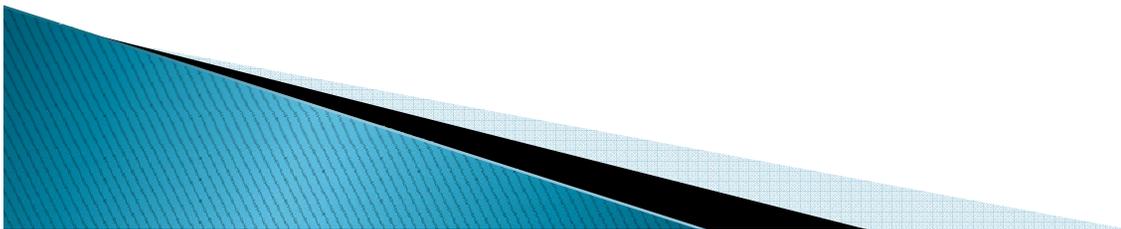
Updating Pellet Stove Population

- ▶ Used Report from Pellet Fuel Institute, 2007
- ▶ Sales Data from PFI 2002–2008 at Region Level
 - Allocated to county level using proportion of Woodstove in county (not a change)



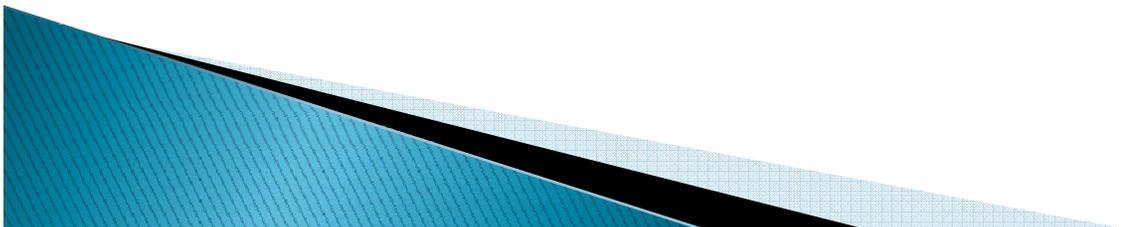
Updating Indoor Wood Furnaces

- ▶ Assumed Population of Indoor Wood Furnaces were same as for 2005



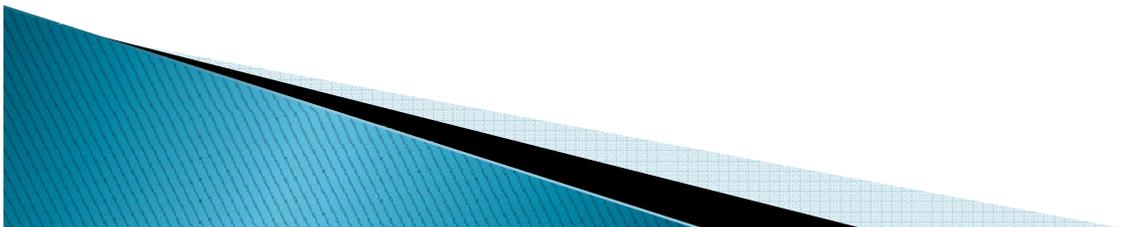
Vermont Report

- ▶ 2007–2008 Survey Commissioned by VT Dept of Forests, Parks & Recreation
 - Jeffrey Merrell (VT APCD)
- ▶ Results of Survey Indicates that While Appliance Population Information Consistent with EPA Tool, Burn Rate is not.
 - 3 X more cords burned than EPA Defaults in RWC Tool
- ▶ EPA adjusted Burn Rates (cords/yr) in RWC Tool for VT, NY and Selected New England Counties (NH, MA, ME, & CT)
 - Based on VT survey data
 - Used Washington county, VT, as typical county
- ▶ Survey Also Indicates Large Increase of Wood–Fired Home Heating Since 2002
 - From ~200,000 cords in 2001/02 to ~400,000 cords in 2007/08
 - Trend had been down in the ten years previous to 2001.



Minnesota Report

- ▶ Residential Fuelwood Assessment, Minnesota, 2007/08 Heating Season
- ▶ Compared to 2002/03, 49% increase in Wood Burned and 57% Increase in the Number of Households that Burn
 - Reversed a downward trend since early 1980's
- ▶ Adjusted All MN Appliance Population and Burn Rate Information by Region per Survey
- ▶ For WI and MN, Created Statewide Average from MN Survey and Adjusted Burnrates and Appliance Population



New Emission Factors from EPA Testing of OHH

- ▶ Coming Soon

