Mitigation Measures in Missoula County

A look at smoke-readiness in Missoula County, Montana

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Missoula City-County Health Department
Missoula County

~117,000 Residents | 2,618 mi² | 2 Air Quality Specialists
What is a smoke-ready community?

A community in which public buildings have filtration for wildfire smoke

A community whose residents understand the health risks associated with wildfire smoke exposure and have access to tools to protect themselves

A community with the resources on hand to help vulnerable and underserved residents
Wildfire Public Health Strategies

### Traditional
- Monitor air quality
- Issue health advisories
- Emphasize reducing activity levels and staying inside

### New Direction
- Monitor air quality
- Issue health advisories
- Emphasize reducing activity levels and staying inside with **filtered air**
- **Create clean air spaces**
  - Direct interventions
  - Policy/Institutional controls
2017 Was a Record-Breaking Wildfire Smoke Year in Missoula County
After-Event Analysis: Filtration Impact on Air Quality

24-hour PM2.5 average concentrations in Missoula and select indoor locations

- Missoula
- Amy's House
- Office Building
- Children's Museum
- High School
- Library
- Senior Center
- Fitness Center

24-Hour NAAQS
After-Event Analysis: Filtration Impact on Air Quality

PM$_{2.5}$ Concentrations on August 18, 2017 in Missoula and Indoor Locations
What’s a MERV?

**Minimum Efficiency Reporting Value**

<table>
<thead>
<tr>
<th>MERV Std 52.2</th>
<th>Intended Dust Spot Efficiency Std 52.1 (%)</th>
<th>Average Arrestance</th>
<th>Particle Size Ranges</th>
<th>Typical Applications</th>
<th>Typical Filter Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 4</td>
<td>&lt;20%</td>
<td>60 to 80%</td>
<td>&gt; 10.0 μm</td>
<td>Residential/Minimum Light Commercial/Minimum Minimum Equipment Protection</td>
<td>Permanent / Self-Cleaning (passive) Washable / Metal, Foam / Synthetics Disposable Panels Fiberglass / Synthetics</td>
</tr>
<tr>
<td>5 - 8</td>
<td>&lt;20 to 60%</td>
<td>80 to 95%</td>
<td>3.0-10.0 μm</td>
<td>Industrial Workplaces Commercial Better / Residential Paint Booth / Finishing</td>
<td>Pleated Filters Extended Surface Filters Media Panel Filters</td>
</tr>
<tr>
<td>9 - 12</td>
<td>40 to 85%</td>
<td>&gt;90 to 98%</td>
<td>1.0-3.0 μm</td>
<td>Superior/Residential Better/Industrial Workplaces Better/Commercial Buildings</td>
<td>Non-Supported / Pocket Filter / Rigid Box Rigid Cell / Cartridge V-Cells</td>
</tr>
<tr>
<td>13 - 16</td>
<td>70 - 98%</td>
<td>&gt;95 to 99%</td>
<td>0.30-1.0 μm</td>
<td>Smoke Removal General Surgery Hospitals &amp; Health Care Superior/Commercial Buildings</td>
<td>Rigid Cell / Cartridge Rigid Box / Non-Supported / Pocket Filter V-Cells</td>
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**MERV Std 52.2**

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<th>Efficiency</th>
<th>Typical Applications</th>
<th>Typical Filter Type</th>
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<td>17 - 20¹</td>
<td>Hospital Surgery Suites Cleanrooms Hazardous Biological Contaminants Nuclear Material</td>
<td>HEPA ULPA</td>
</tr>
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</table>

Current commercial standard
Some Smoke-Ready Goals

• Heating, ventilation and air conditioning (HVAC) systems recirculating air through MERV 13+ filters during smoke events

• Appropriately sized portable air cleaners with true high-efficiency particulate air (HEPA) filtration in buildings without HVAC systems

• Good door and window control to limit smoke infiltration

• Public understanding about the importance of creating clean indoor air during smoke events
Mitigation Measures in Missoula
Public spaces

A community in which public buildings have filtration for wildfire smoke
Schools

- MERV 13+ filters in all new and remodeled public schools in Missoula County
- MERV 13+ requirements in new MT School Rules draft (in legal review)
- HEPA portable air cleaner (PAC) dissemination during 2017 wildfires, cache on-hand in 2018
- Community Needs Assessment completed in 2018 by Climate Smart Missoula (CSM)
Libraries

• Missoula’s current library (c. 1974) HVAC can’t filter out PM2.5
• New library (opening in 2020) will have MERV 13 filters installed during wildfire season
Privately owned public spaces

MERV 13 commitment in new buildings:

• Residence Inn Missoula
• Staybridge Suites
• Community Hospital Cancer Patient Family Center

Some facilities are ahead of the game

• DirectTV/AT&T – filtration for fine particulate and VOCs for their Missoula employees
A community whose residents understand the health risks associated with wildfire smoke exposure and have access to tools to protect themselves

Individuals
Smoke-ready outreach

- Columns in the Missoulian before 2018 smoke season
- News releases about preparing for wildfire smoke generated multiple stories in local media
- Excellent relationship with local media = more people to carry the message

COLUMNISTS

Keeping wildfire smoke out of large homes
SARAH COEFIELD | Jul 27, 2018
Today we're focusing on creating clean indoor air for those who work in or go to a school, office, indoor recreation area or other enclosed space when wildfire smoke is prevalent.

COLUMNISTS

Keeping cool during smoke season
SARAH COEFIELD | Jul 20, 2018
According to the Centers for Disease Control, every year 153,000 deaths in the United States are killed by extreme heat. However, we often don't know how to respond to smoke.

COLUMNISTS

Practical tips for filtering indoor air
SARAH COEFIELD | Jul 12, 2018
In last week's column (July 5), we learned why it's important to keep the air in your space during wildfire smoke season. This week, we will share some practical tips for filtering indoor air.
As forest fires in the western United States grow in size, severity, and frequency, and as the wildfire season lengthens, the amount of wildfire smoke we breathe increases too. Smoke can settle in Montana communities from fires in local forests, from nearby states like Idaho, and even as far as Washington, California, and Canada. Visit the different pages of this site to find out more about the health risks of smoke, current smoke levels in your area, and what you can do to stay healthy.
Public health messaging during a smoke event

- Current air quality conditions
- Where the smoke is coming from
- Fire activity
- Smoke behavior
- How conditions will (or won’t) change during the day
- Where to find cleaner air
- How to stay protected from the smoke
A community with the resources on hand to help vulnerable and underserved residents

Vulnerable and underserved residents
A public/private partnership born out of a shared desire to protect the public from wildfire smoke led to a smoke-ready pilot project in 2017. The project provided HEPA PACs to home-bound seniors with respiratory challenges and families with new babies. The project ballooned in response heavy wildfire smoke to include clinic patients and small elementary schools.

Intern Terri with volunteers from Lion’s Den Ministries - getting ready to deliver filters.

A happy air cleaner recipient!
Helping Individuals

Climate Smart Missoula donated 25 portable air cleaners to Seeley Lake health clinic patients and 5 portable air cleaners to the clinic itself in 2017.

“I believe that machine saved my life, I really do.”

-Don Dunagan, Seeley Lake resident
Preschools and Daycares

- PACs disseminated by Missoula City-County Health Department (MCCHD) and CSM to local daycares and preschools in 2018 – more than 500 young children had filtered air
- MCCHD and CSM plan to continue the program in 2019
Climate Smart Missoula has donated PACs to schools with students who have special health needs – the PACs will be in all their classrooms.
Next steps, concluding thoughts
Next Steps:

- Smoke-ready messaging will be included in wildfire preparedness outreach materials to residents in the wildland-urban interface (WUI)
Next Steps:

- Community Needs Assessment that looks at indoor fitness facilities and activity spaces
Next Steps:

- Host a workshop or series of workshops for local businesses to promote cleaner indoor air spaces during wildfire smoke events.
- Goal: protect employee health and provide opportunities for customers to get out of the smoke and into local businesses.
- Modeled after SmokeWise Ashland workshop
Next Steps:

• Upcoming study to assess effectiveness of our wildfire smoke communication, outreach and intervention programs
  • Study plan and partners identified
  • Working out funding
Next Steps:

FEMA Post Fire Hazard Mitigation Grant

- Wildfire smoke adaptation/mitigation plan for the county to be incorporated into disaster management planning.
- Additional monitors for MCCHD
- PACs for CSM’s cache
Next Steps:

Wildfire smoke public health study in partnership with EPA
- Launching summer 2019
- Research in Missoula County and Research Triangle Park (NC)

• Evaluate the effectiveness of different filtration and HVAC setups during wildfire smoke events

• Test useful lifespan of consumer-grade HEPA filters under wildfire smoke conditions
As community size grows (or as resources shrink):

- The need for institutional/policy/engineering controls also grows
- The need for individuals’ self-sufficiency grows
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<td>Social and health equity</td>
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<td>Balance indoor air pollutant concerns with outdoor air pollutant concerns</td>
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<tr>
<td>Heat vs. Smoke</td>
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<td>Can we do a better job removing VOCs?</td>
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Questions?

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