Climate change mitigation in low-income communities in Colorado: Home weatherization impacts on respiratory health and indoor air quality during wildfires

Fire Study

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- Gaseous and particulate concentration logging
  - CO
  - CO₂
  - HCHO
  - PM₂.₅
  - O₃
  - Temp
  - RH%

30 Fire Study Homes
- 15 Low ACH50 Homes
- 15 High ACH50 Homes

Home Visit 1 (During Fire 3 days):
- Air Quality Instruments
- Inside and Outside
- Handout TAD

Home Visit 2 (72 hours after visit 1):
- Collect TAD
- Collect instruments
- Spirometry
- Respiratory Questionnaires
- $25 Incentive

Home Visit 3 (Post-Fire 1 month):
- Air Quality Instruments
- Inside and Outside
- Handout new TAD

Home Visit 4 (72 hours after visit 3):
- Collect TAD
- Collect instruments
- Spirometry
- Respiratory Questionnaires
- $25 Incentive

Activity: Windows and/or Doors Open

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Location</th>
<th>Morning</th>
<th>Afternoon</th>
<th>Evening</th>
<th>Early Morning (Night time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Kitchen</td>
<td>5 6 7 8</td>
<td>9 10 11</td>
<td>12 1 2 3 4 5</td>
<td>6 7 8 9 10 11 12 1 2 3 4</td>
</tr>
<tr>
<td>T</td>
<td>Living Room</td>
<td>5 6 7 8</td>
<td>9 10 11</td>
<td>12 1 2 3 4 5</td>
<td>6 7 8 9 10 11 12 1 2 3 4</td>
</tr>
<tr>
<td>W</td>
<td>Bedroom</td>
<td>5 6 7 8</td>
<td>9 10 11</td>
<td>12 1 2 3 4 5</td>
<td>6 7 8 9 10 11 12 1 2 3 4</td>
</tr>
<tr>
<td>Th</td>
<td>House Empty</td>
<td>5 6 7 8</td>
<td>9 10 11</td>
<td>12 1 2 3 4 5</td>
<td>6 7 8 9 10 11 12 1 2 3 4</td>
</tr>
</tbody>
</table>

DATE
___/___/___
Summer 2016 - Near vs. Far Fires

August 17, 2016

Fire Plume by Density

Smoke Plume Density
- 2,000 Micrograms/Cubic Meter
- 5,000 Micrograms/Cubic Meter
- 10,000 Micrograms/Cubic Meter

Rocky Mountain Physiographic Boundary

August 17, 2016

Fire Plume by Density

Smoke Plume Density
- 2,000 Micrograms/Cubic Meter
- 5,000 Micrograms/Cubic Meter
- 10,000 Micrograms/Cubic Meter
- 15,000 Micrograms/Cubic Meter
- 20,000 Micrograms/Cubic Meter

Rocky Mountain Physiographic Boundary
Fire Study Results

- 5 homes enrolled in 2016
- PM2.5 I/O > 1 (except in one very clean home)
Fire Study Results

Outdoor PM2.5 typically higher, except during cooking events
Most below the COEHHA recommended limit of 27 ppb
Acknowledgements

• Xcel Energy
• Boulder Housing Partners
• Habitat for Humanity
• EPA Star Grant #R835752
• Residents
• Students at University of Colorado and Ohio State University
Home Weatherization
INDOOR AIR QUALITY & HEALTH

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