Protecting public health with pretty pictures – satellite data’s role in wildfire smoke public health messaging

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Air quality specialists...

Protect public health by reducing air pollution in Missoula County

- Monitor air quality
- Perform data analysis
- Conduct research
- Write policy and rules
- Enforce rules
- Educate the public
Air quality specialist tasks during wildfire season:

- Monitor air quality
- Provide health advisories to the public
- Collect snazzy smoke photos
- And also do everything else the job normally requires (divide and conquer)
Public health goal during a smoke event:

Reduce the public’s exposure to harmful levels of smoke.

Why?

Reduced smoke exposure will also reduce

- Hospital admissions
- Exacerbated respiratory and cardiac symptoms
- Mortality
- Development of PM2.5-related illness
Wildfire smoke updates

Compile weather data, smoke data, fire activity information and health advisories into one coherent message.

Incorporate maps and photos.

Updates generally issued twice per day.
Public health messaging for wildfire smoke

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

By increasing the public’s knowledge about the smoke we can aid individual decision making and potentially reduce a sense of helplessness.
Where is the smoke coming from?
Where is the smoke coming from?
Fire activity

Explains current conditions and what the future holds (what goes up must come down...somewhere).

http://col.st/EXGgF
Smoke behavior

POOLING SMOKE TRAPPED UNDER A MORNING INVERSION

AUGUST 18, 2017
Smoke behavior

SIGNIFICANT PLUME FORMATION WITH SOME SMOKE TRAPPED NEAR VALLEY FLOORS

AUGUST 18, 2017
August 18, 2017 Wildfire Smoke PM2.5
Smoke Behavior

SMOKE LINGERING ABOVE AN INVERSION LAYER

AUGUST 20, 2018
Smoke behavior

HIGH PRESSURE CREATING A SMOKE SPIRAL

SEPTEMBER 6, 2017
Changing conditions

August 22, 2018
Where to find cleaner air
<table>
<thead>
<tr>
<th>Health Effect Category</th>
<th>Good (13+)</th>
<th>Moderate (9-13)</th>
<th>Unhealthy for sensitive groups (5-9)</th>
<th>Unhealthy (2-5)</th>
<th>Very Unhealthy/ Hazardous (Less than 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visibility (miles)</td>
<td>13+</td>
<td>9-13</td>
<td>5-9</td>
<td>2-5</td>
<td>Less than 2</td>
</tr>
<tr>
<td>NOWCast Concentration (µg/m³)</td>
<td>≤ 12</td>
<td>12 - 35</td>
<td>35 - 55</td>
<td>55 - 150</td>
<td>150 +</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recess or Other Outdoor Activity (15 minutes)</th>
<th>No limitations</th>
<th>No limitations</th>
<th>Make indoor space available for all children to be active, especially young children. If outdoors, limit vigorous activities and people with chronic conditions should be medically managing their condition.</th>
<th>Keep all children indoors.</th>
<th>Keep all children indoors.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Education Class (1 hour)</td>
<td>No limitations</td>
<td>Monitor sensitive groups and limit their vigorous activities.</td>
<td>Make indoor space available for all children to be active, especially young children. If outdoors, limit vigorous activities and people with chronic conditions should be medically managing their condition.</td>
<td>Conduct P.E. indoors. If outdoors, only allow light activities for all participants. People with chronic conditions should be medically managing their condition.</td>
<td>Conduct P.E. in a safe (good air quality) indoor environment.</td>
</tr>
<tr>
<td>Athletic Practice, Training (2-4 hours)</td>
<td>No limitations</td>
<td>Monitor sensitive groups and limit their vigorous activities.</td>
<td>People with chronic conditions should be medically managing their condition. Increase rest periods and substitutions for all participants to lower breathing rates.</td>
<td>Conduct practice and trainings indoors. If outdoors, allow only light activities for all participants. Add rest breaks or substitutions to lower breathing rates. People with chronic conditions should be medically managing their condition.</td>
<td>Conduct practice and trainings in a safe (good air quality) indoor environment.</td>
</tr>
<tr>
<td>Scheduled Sporting Events (2-4 hours)</td>
<td>No limitations</td>
<td>Monitor sensitive groups and limit their vigorous activities.</td>
<td>People with chronic conditions should be medically managing their condition. Increase rest periods and substitutions for all participants to lower breathing rates.</td>
<td>Consider rescheduling or relocating event. If outdoor event is held, have emergency medical support immediately available. Add rest breaks or substitutions to lower breathing rates. People with chronic conditions should be medically managing their condition.</td>
<td>Reschedule or relocate event.</td>
</tr>
</tbody>
</table>

Examples of light activities:
- Walking slowly on level ground
- Carrying school books
- Hanging out with friends

Examples of moderate activities:
- Skateboarding
- Slow pitch softball
- Shooting basketballs

Examples of vigorous activities:
- Running, jogging
- Playing football, soccer, and basketball

Please note that the intensity of an activity can vary by person and ability.
Satellite data can enhance public understanding of current and future smoke conditions. This information, coupled with health advisories and specific tips for limiting smoke exposure can be used to reduce wildfire smoke’s impacts on public health.
Questions?

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