

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

SARAH COEFIELD

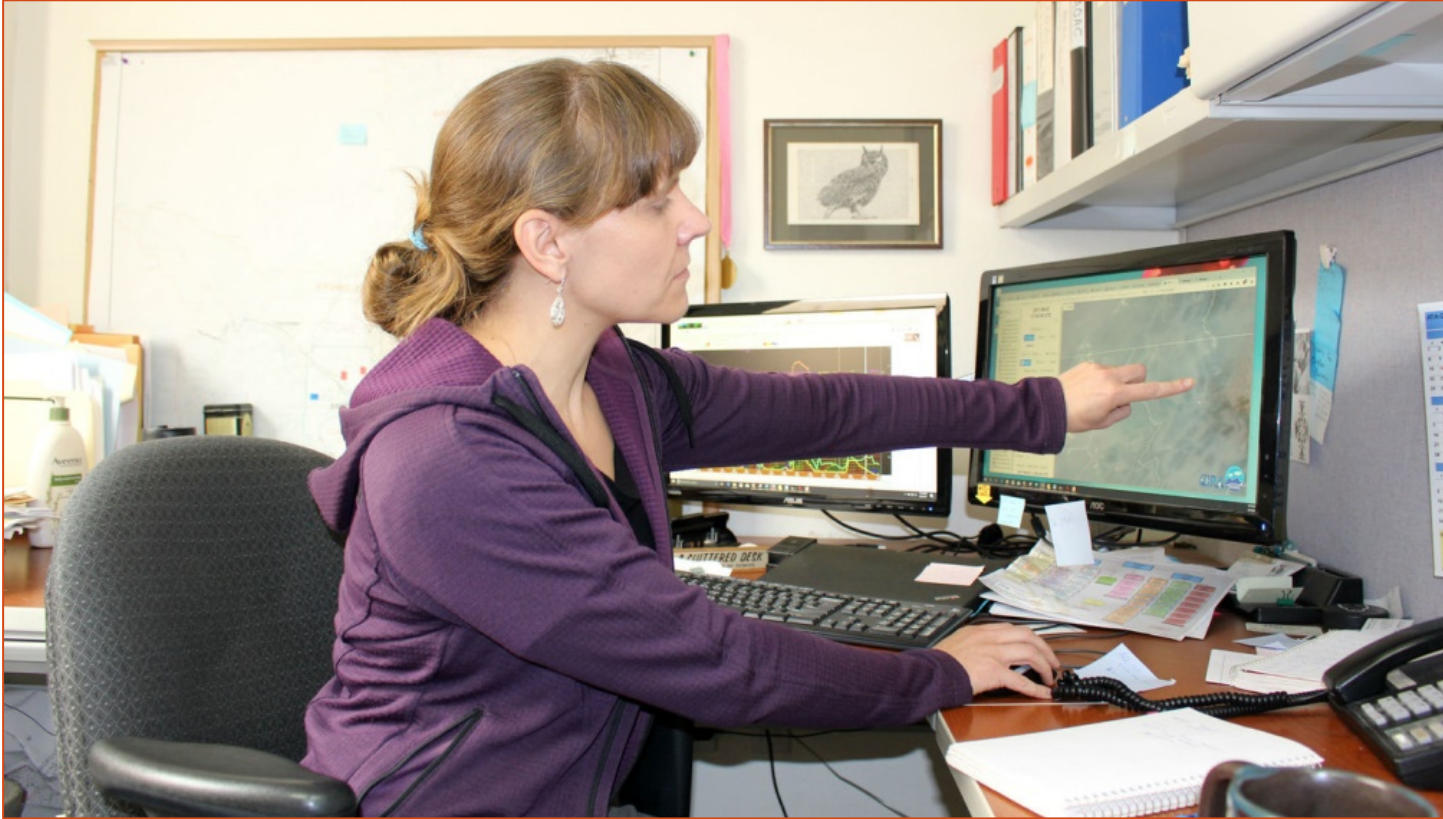
MISSOULA CITY-COUNTY HEALTH DEPARTMENT

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)

Missoula

United
States
of America

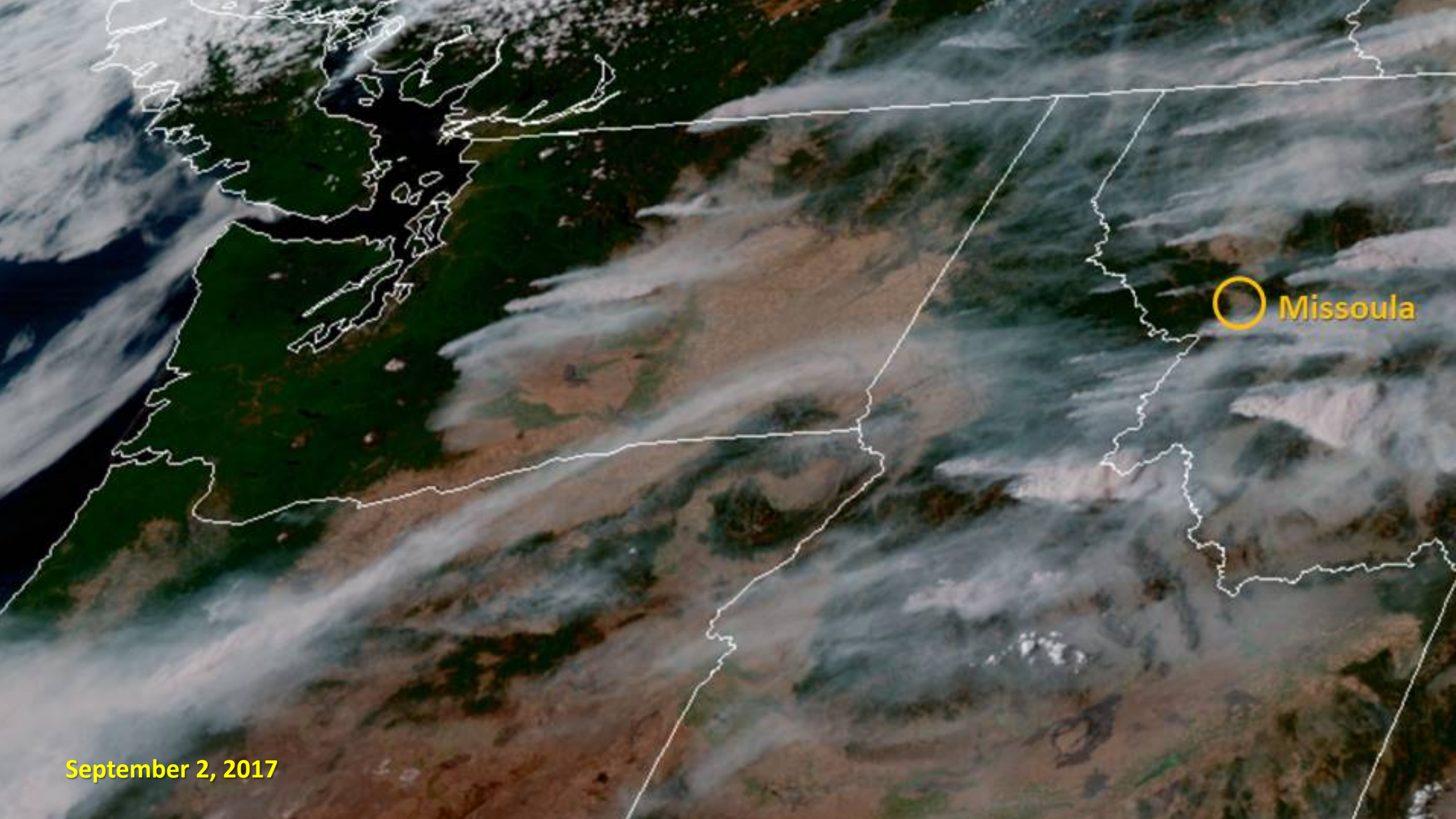
Golfo de
California

Gulf of
Mexico

Mexico



WORLDVIEW



Missoula

September 2, 2017

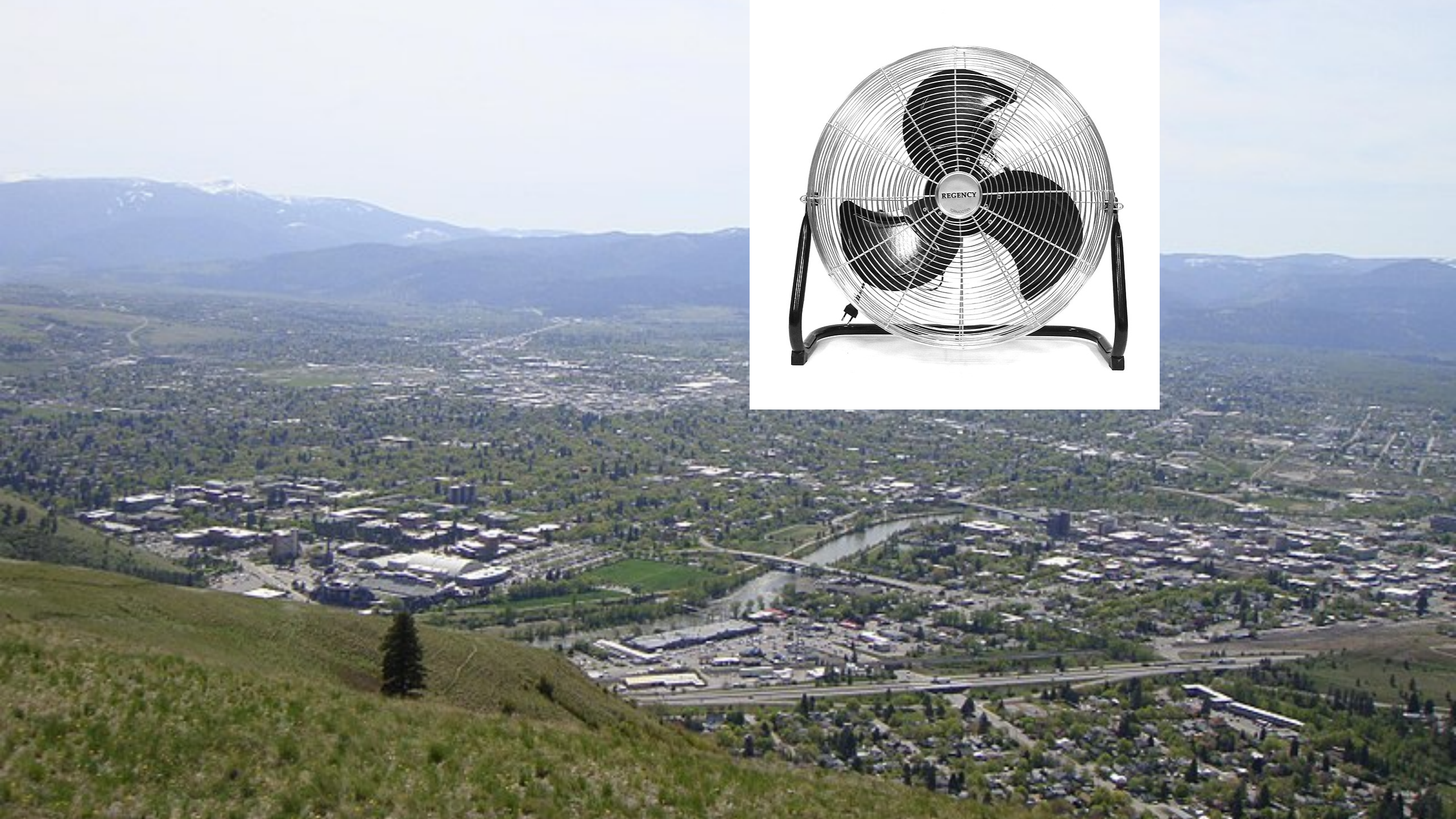
Public health goal during a smoke event:

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.

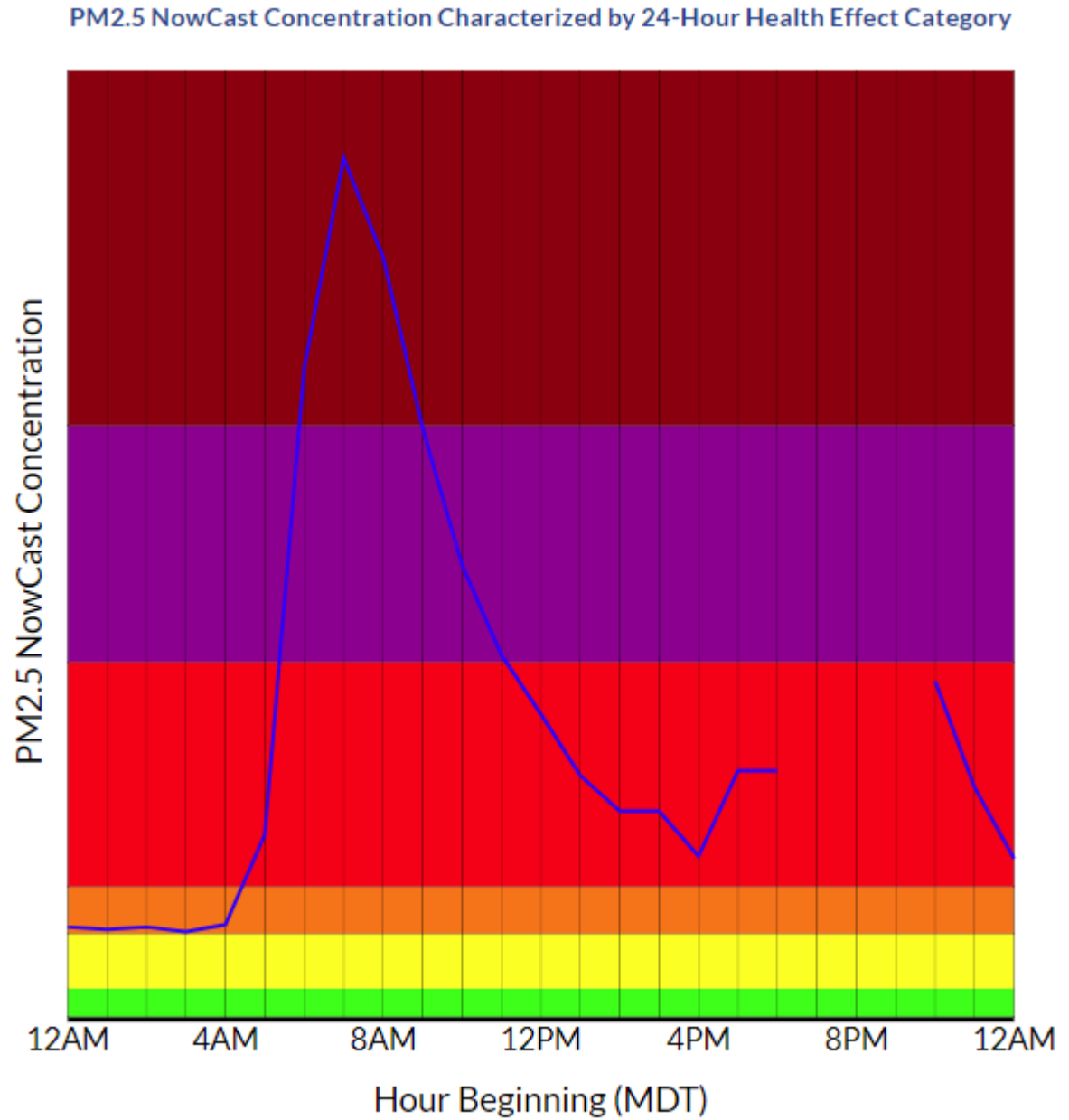
Where is the
smoke coming
from?

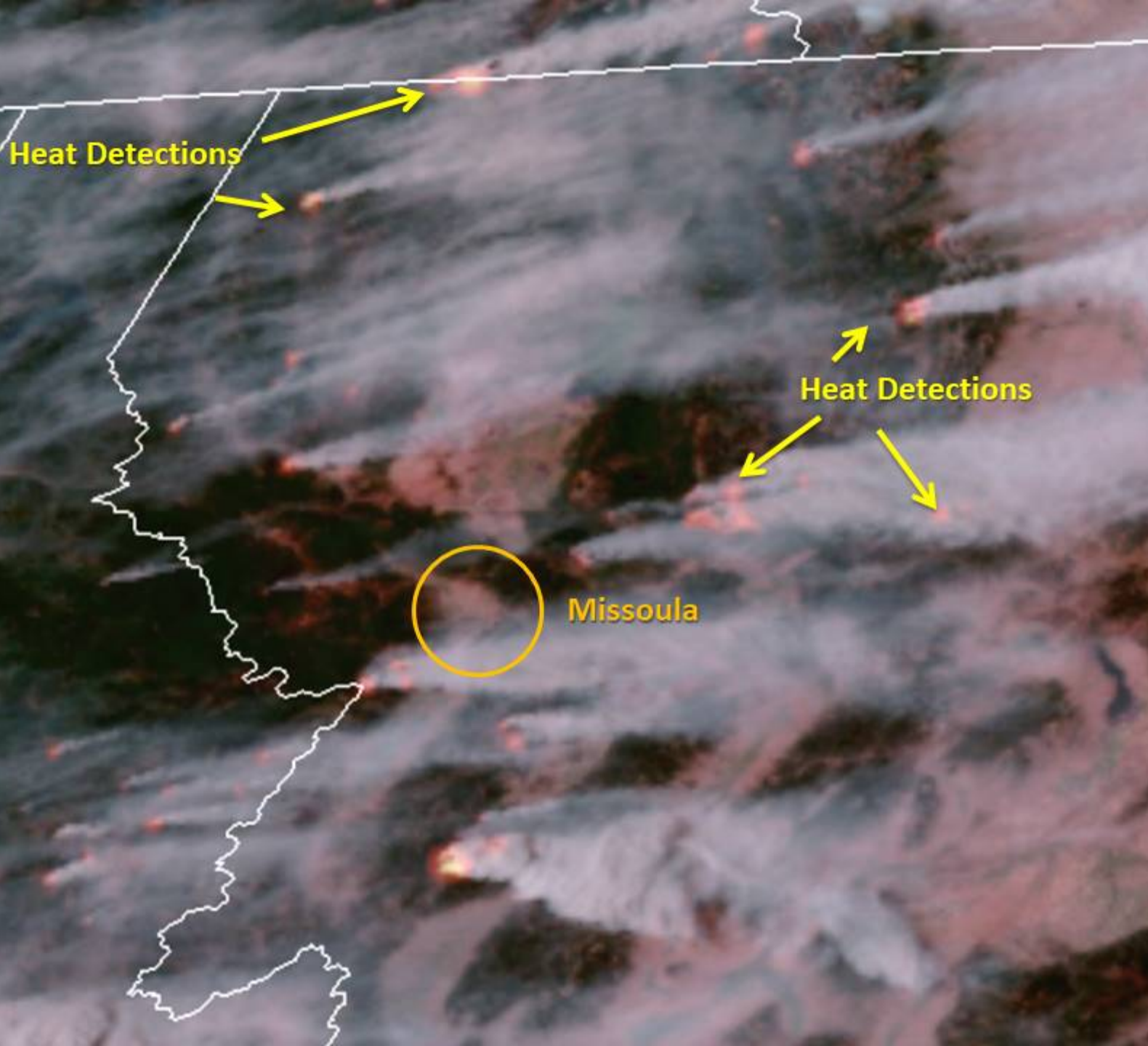


August 20, 2017

Photo credit: KULR8

Where is the
smoke coming
from?





Fire activity

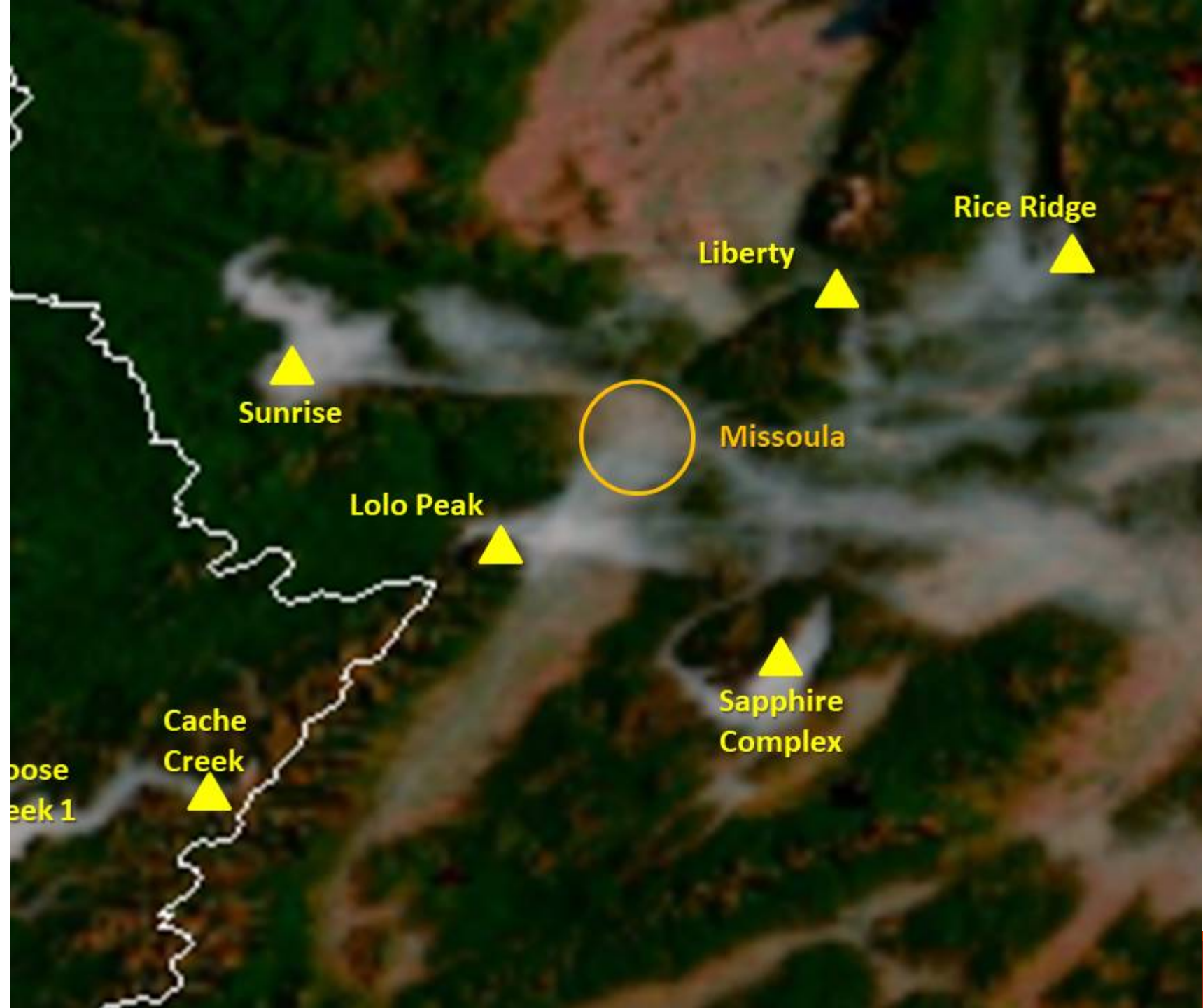
Explains current conditions and what the future holds (what goes up must come down...somewhere).

<http://col.st/EXGgF>

Smoke behavior

POOLING SMOKE TRAPPED
UNDER A MORNING
INVERSION

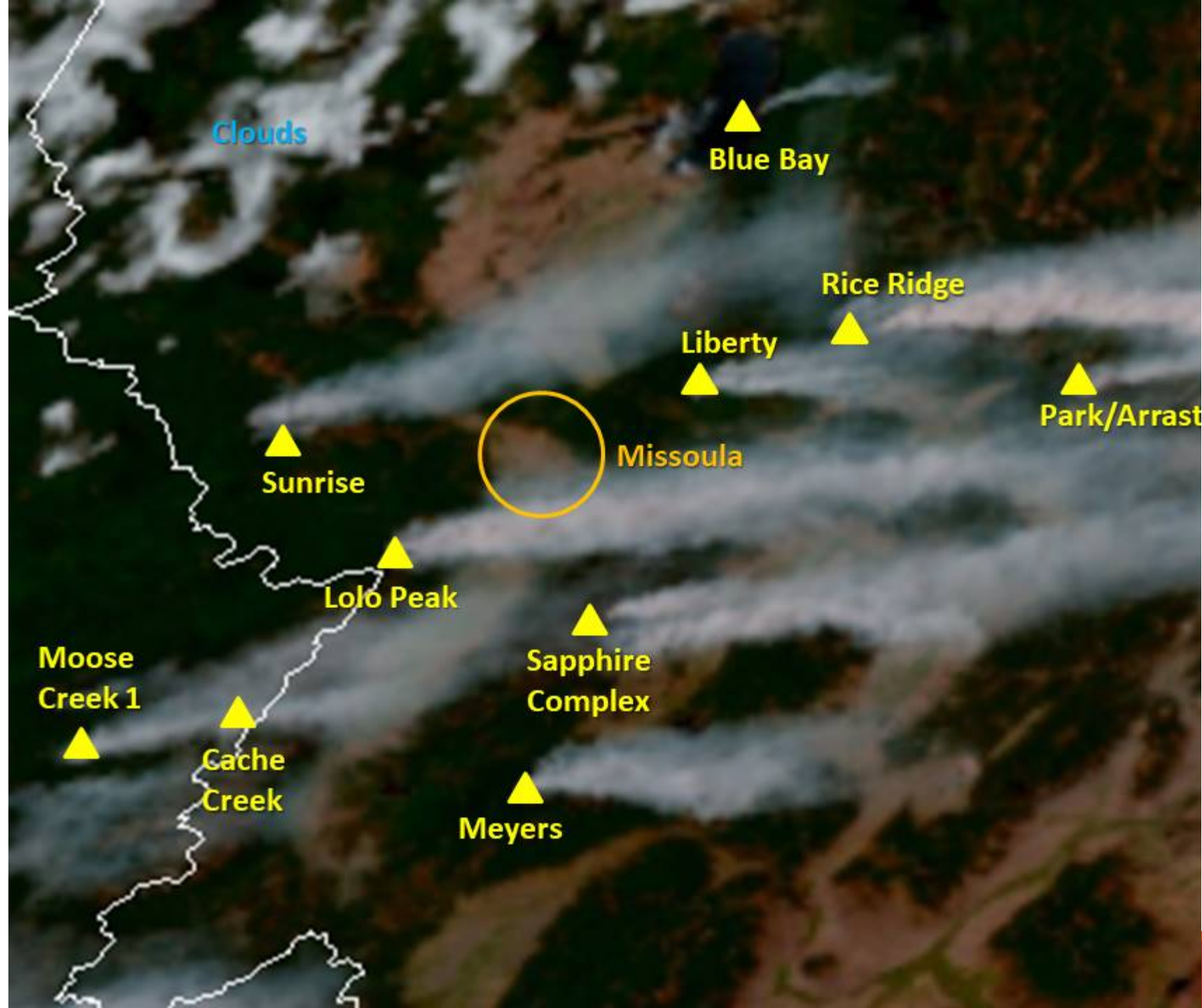
AUGUST 18, 2017



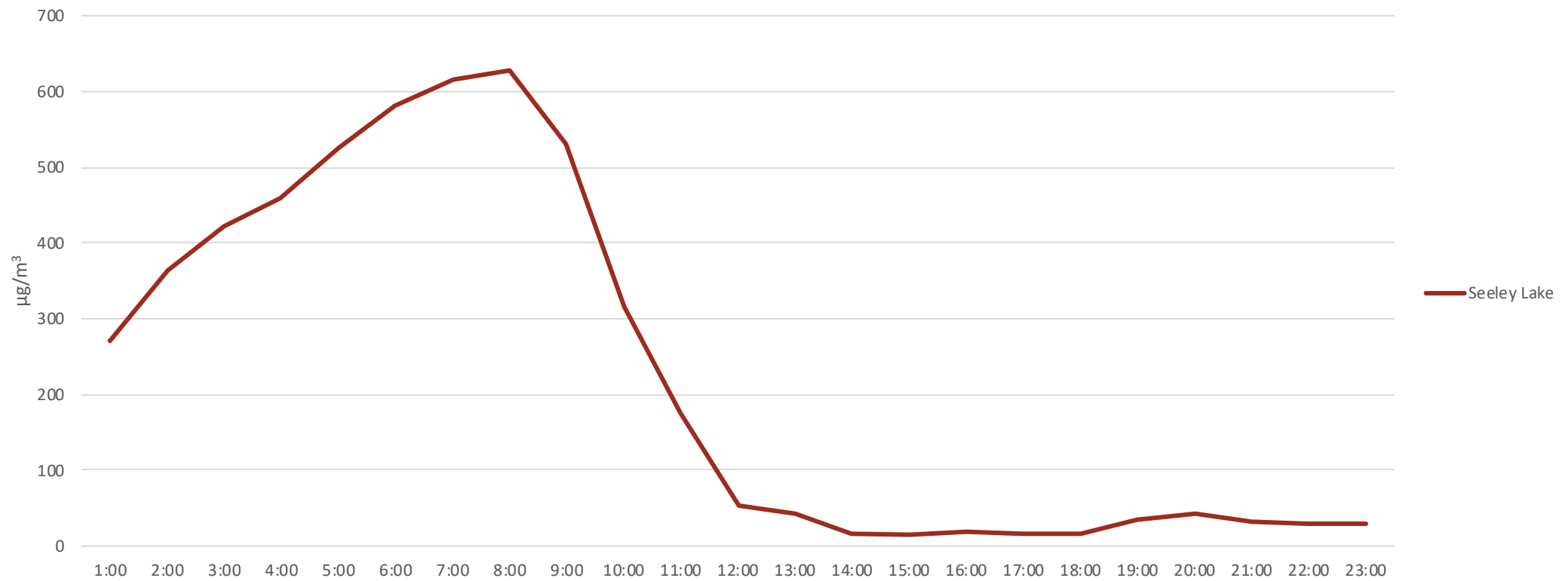
Smoke behavior

SIGNIFICANT PLUME FORMATION
WITH SOME SMOKE TRAPPED NEAR
VALLEY FLOORS

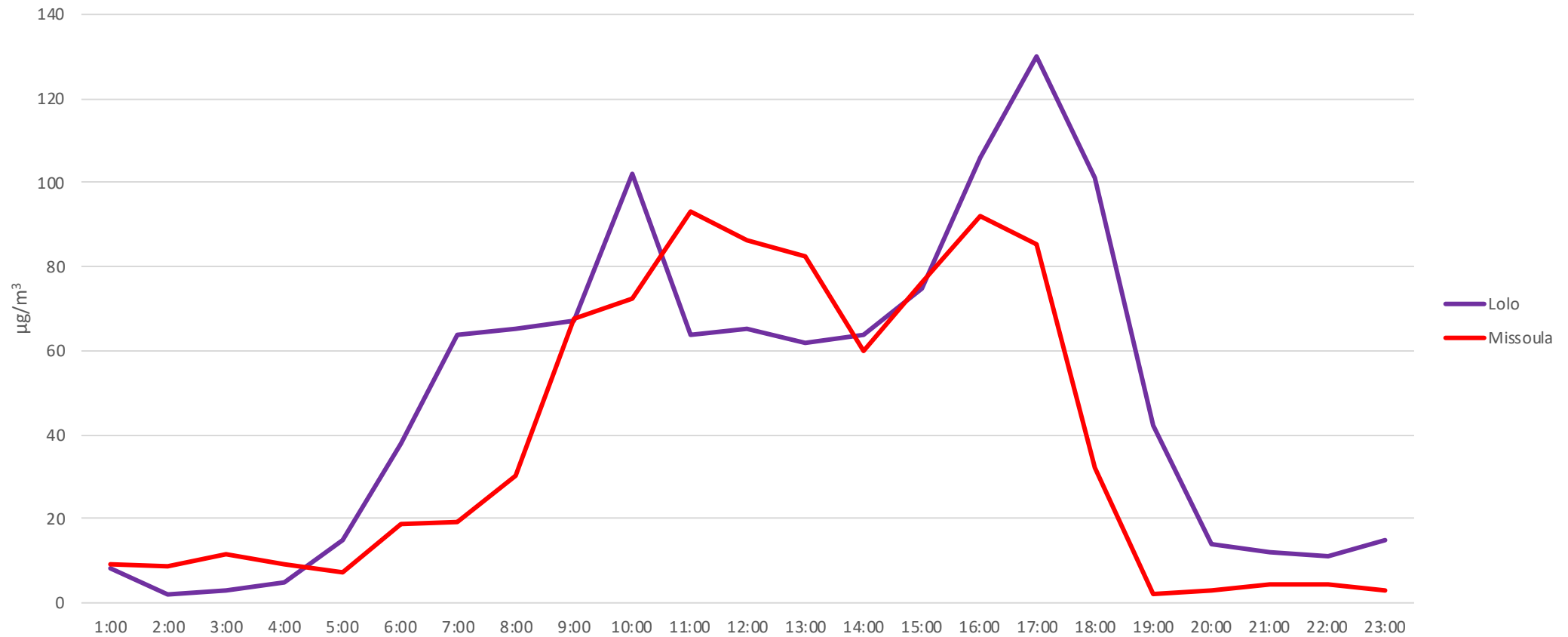
AUGUST 18, 2017



August 18, 2017 Wildfire Smoke PM2.5



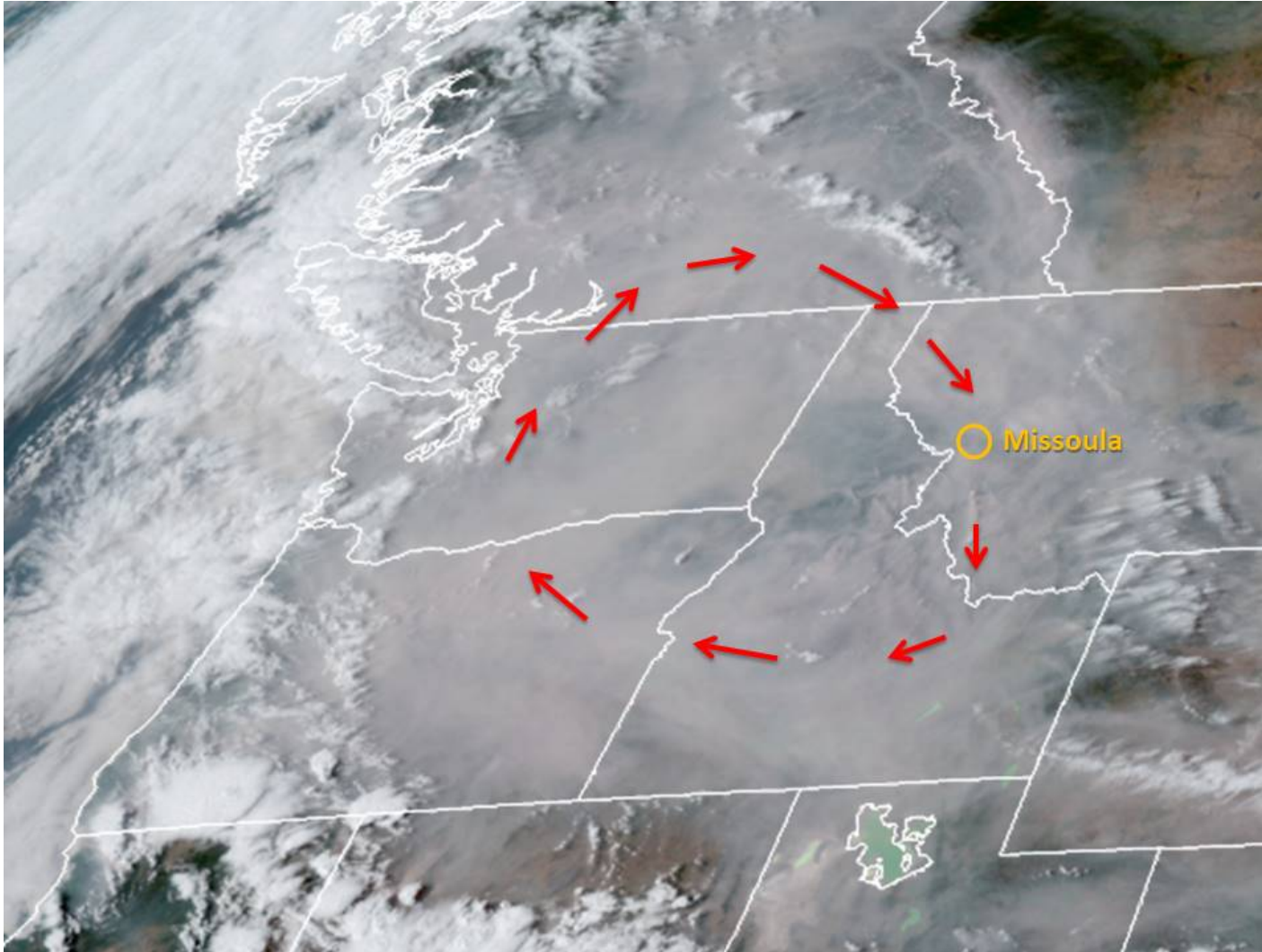
August 18, 2017 Wildfire Smoke PM2.5



Smoke Behavior

SMOKE LINGERING ABOVE AN
INVERSION LAYER

AUGUST 20, 2018



Smoke behavior

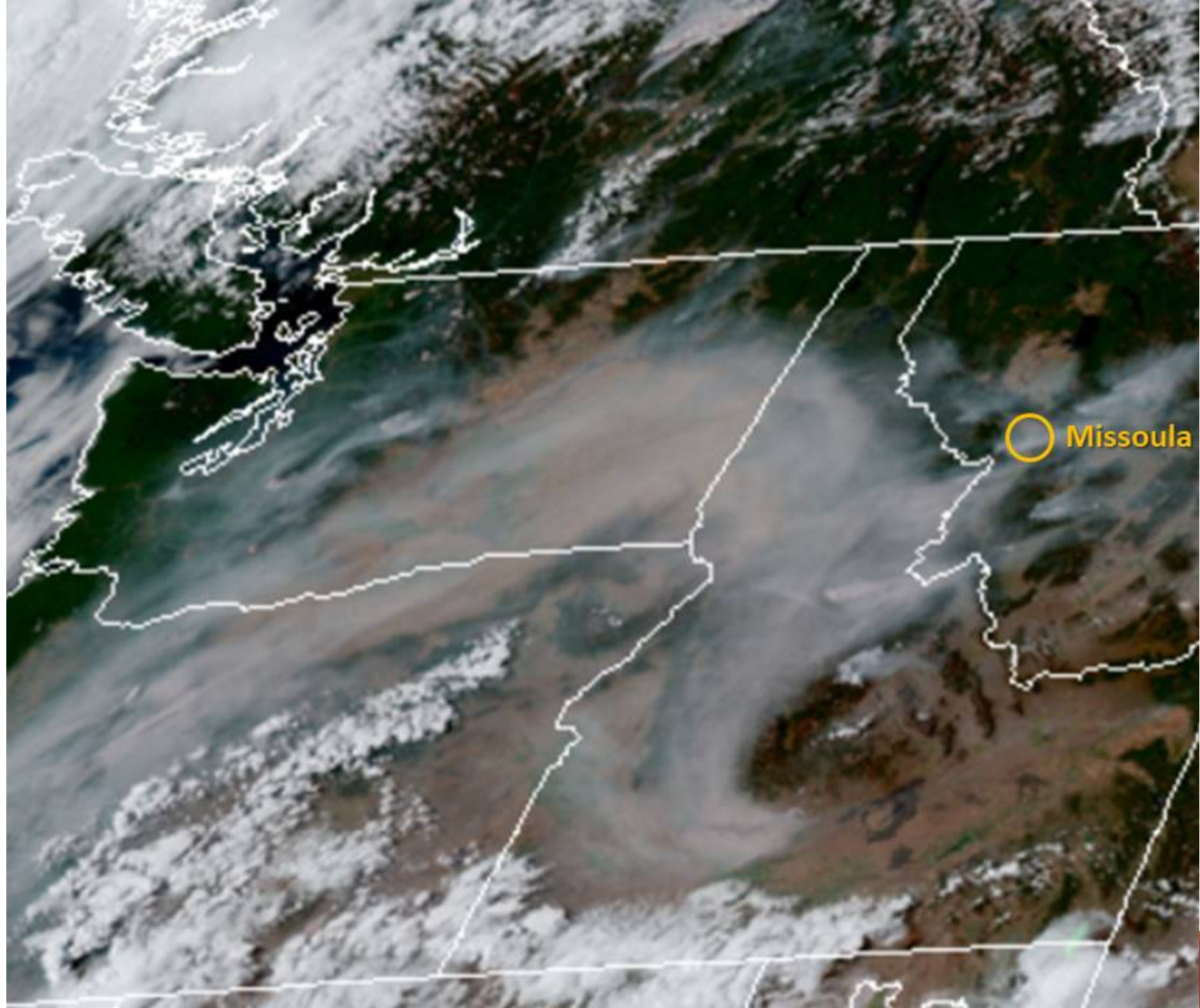
[HTTP://COL.ST/DCCWA](http://col.st/dccwa)

HIGH PRESSURE CREATING A
SMOKE SPIRAL

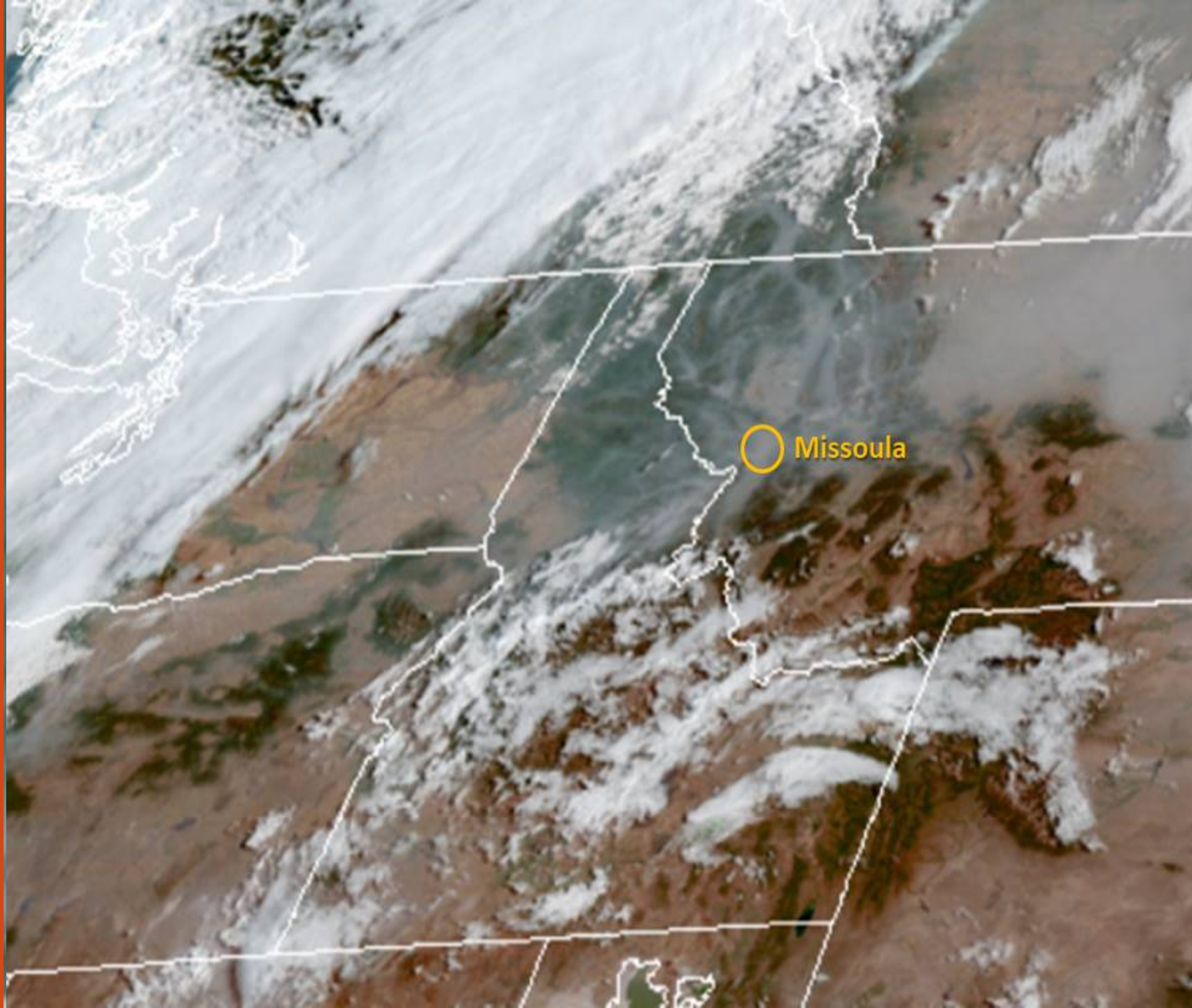
SEPTEMBER 6, 2017

Changing conditions

August 22, 2018



Where to find
cleaner air

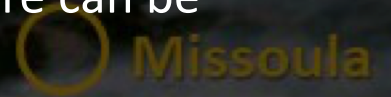


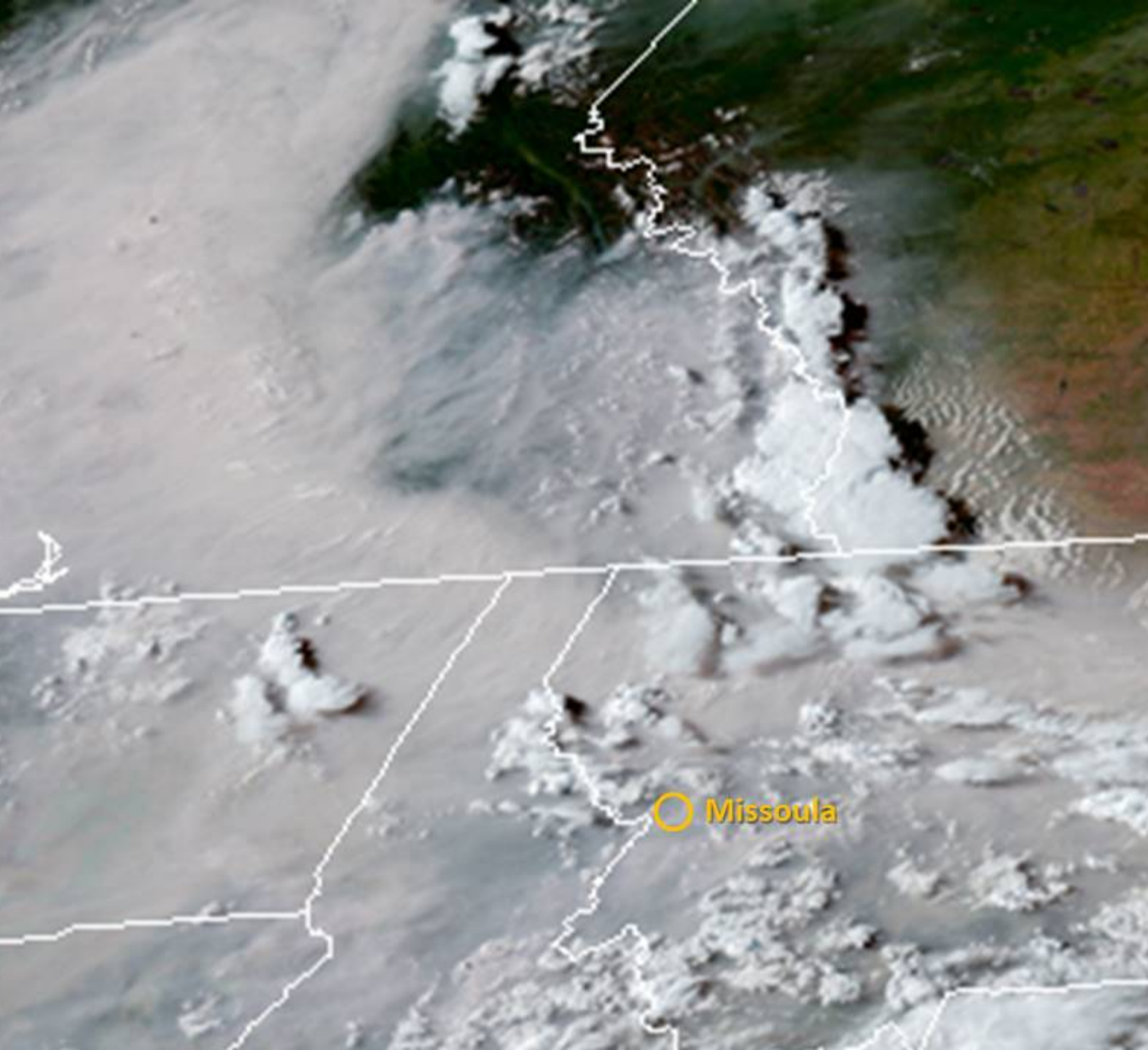
Recommendations for Outdoor Activities Based on Air Quality for Schools and Child Care Facilities

Health Effect Category	Good	Moderate	Unhealthy for sensitive groups*	Unhealthy	Very Unhealthy/ Hazardous
Visibility (miles)	13+	9-13	5-9	2-5	Less than 2
NowCast Concentration (µg/m ³)	≤ 12	12 - 35	35 - 55	55 - 150	150 +
Recess or Other Outdoor Activity (15 minutes)	No limitations	No limitations	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.	Keep all children indoors.	Keep all children indoors.
Physical Education Class (1 hour)	No limitations	Monitor sensitive groups and limit their vigorous activities.	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.	Conduct P.E. indoors. If outdoors, only allow light activities for all participants. People with chronic conditions should be medically managing their condition.	Conduct P.E. in a safe (good air quality) indoor environment.
Athletic Practice, Training (2-4 hours)	No limitations	Monitor sensitive groups and limit their vigorous activities.	People with chronic conditions should be medically managing their condition. Increase rest periods and substitutions for all participants to lower breathing rates.	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.	Conduct practice and trainings in a safe (good air quality) indoor environment.
Scheduled Sporting Events (2-4 hours)	No limitations	Monitor sensitive groups and limit their vigorous activities.	People with chronic conditions should be medically managing their condition. Increase rest periods and substitutions for all participants to lower breathing rates.	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.	Reschedule or relocate event.
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

Summary

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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