



# **Air Quality Response to Marshall Fire**

**Boulder County, Colorado**

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**BOULDER COUNTY  
PUBLIC HEALTH**

Opportunity for a healthy life.

# 2020 Wildfires

## **Cameron Peak** Aug. 13 – Dec. 2

- 208,913 acres
- Largest wildfire in Colorado history
- 469 structures destroyed

## **East Troublesome** Oct. 14 – Nov. 30

- 193,812 acres
- 580 structures destroyed
- 2 fatalities

## **Calwood** Oct. 17 – Nov. 19

- 10,106 acres
- 28 structures destroyed



# Wildfire Smoke Not Our Only Concern

**The EPA moves to declare the Front Range a 'severe' air quality violator. Here's why that matters.**

 By Sam Brasch | April 12, 2022



# Marshall Fire



- Fire started Dec. 30, 2021, around 10:30 a.m.
- 6,200 acres by 10:00 a.m. on Dec. 31
- Less than 12 hours after igniting, fire became state's most destructive in terms of structures lost
- Snowfall ended fire on the night of Dec. 31
- Estimated 1084 structures burned and another 149 damaged
- One confirmed dead and one presumed dead



# Contributing Factors

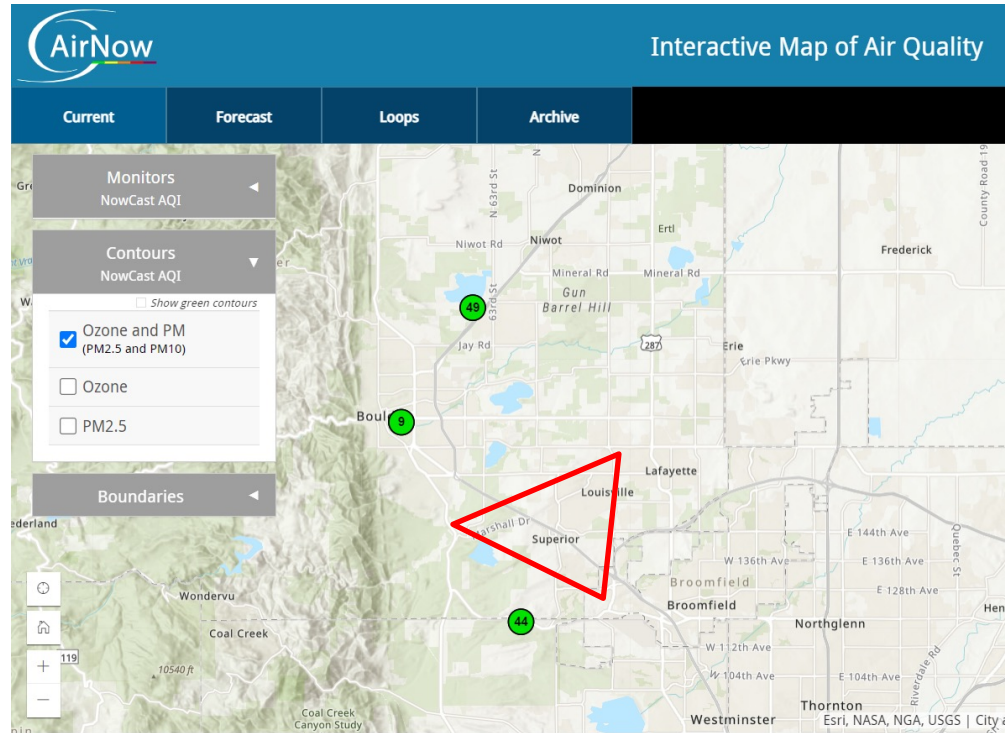
- Wet spring with above average growth of grass, followed by unusually warm and dry summer and fall created ideal conditions for wildfires
- High winds were recorded in the area, with gusts of up to 115 miles per hour



# Initial Air Monitoring in Burn Area

- Concerns for gaseous pollutants and particulates
  - Gaseous pollutants are anticipated to dissipate in weeks to months
  - Particulates will likely be a concern for a year or more
- Deployed 6 Clarity PM2.5 monitors in burn area and worked with DDPHE to display readings on their Love My Air Platform
- Collaborated with NOAA to sample for gaseous pollutants

# Existing Monitoring Not Sufficient



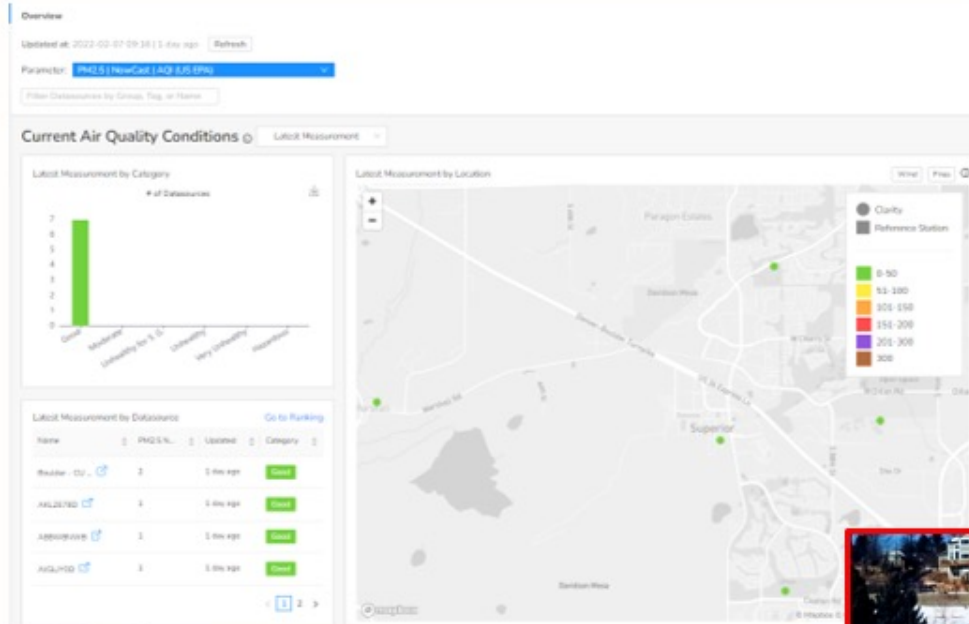
# Clarity Node-S



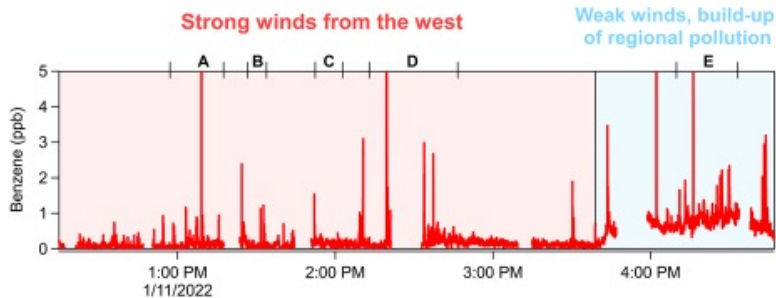
- \$1,200 annual subscription per monitor
- Solar powered
- Cellular data transmission



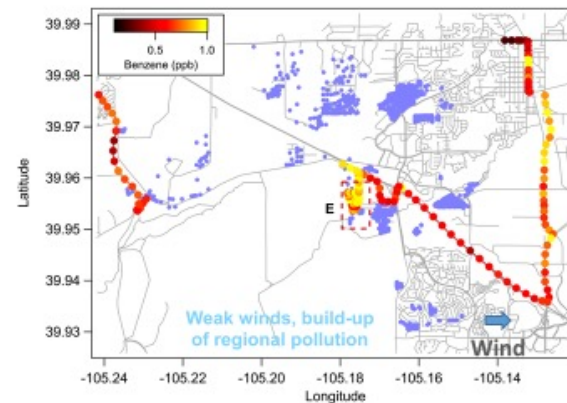
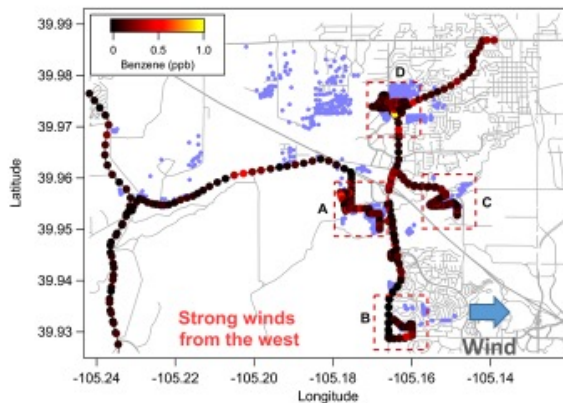
# BCPH Particulate Air Sampling



# NOAA Gaseous Air Sampling



- Benzene is a molecule emitted from fires, but also comes from motor vehicles in urban areas.
- Regional increases from other pollution sources outweigh impacts due to fires.
- Other aromatic compounds show similar behavior.



# Public-Facing Data

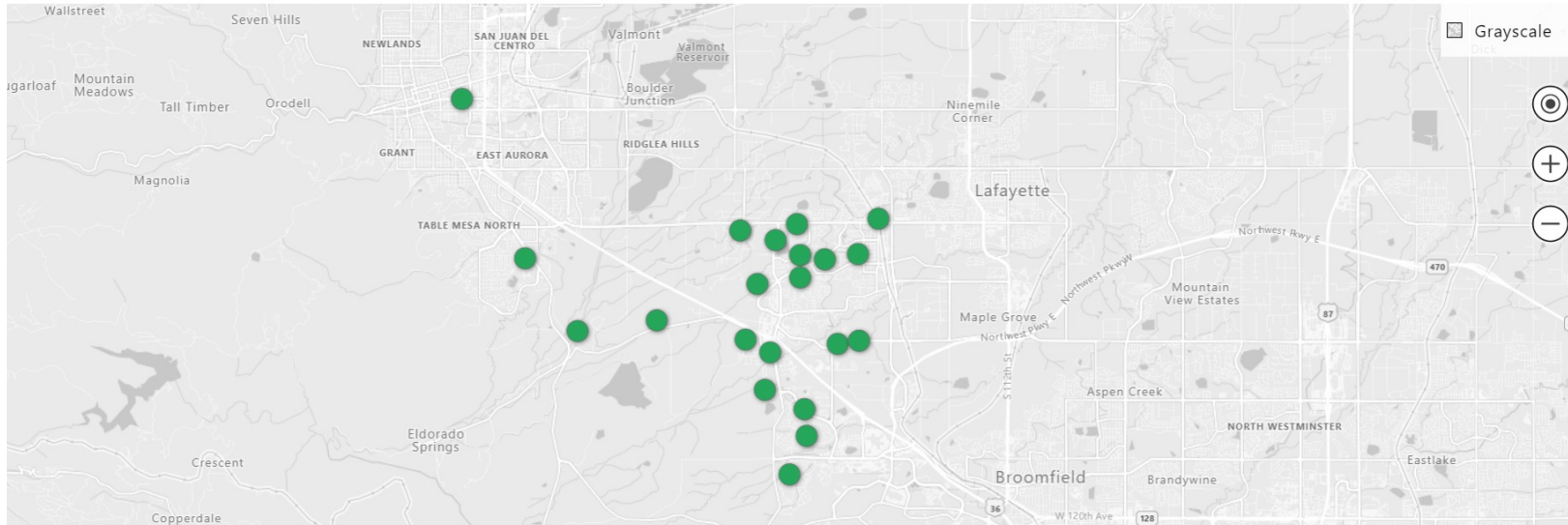
## Marshall Fire: Air Quality



Grid View

HOME ABOUT RESOURCES EN

Get Notifications



# Public-Facing Data

## Marshall Fire: Air Quality



Map View

HOME ABOUT RESOURCES EN

Get Notifications

Paragon Drive

Good



NowCast

Suggested Action

It's a great day to be active outside.



# Public-Facing Data

Good  
0 - 50

Moderate  
51 - 100

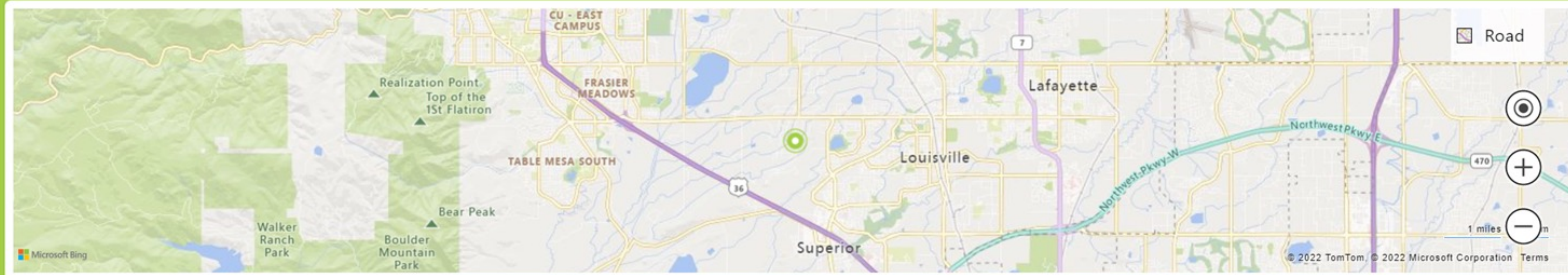
Unhealthy for Sensitive  
101 - 150

Unhealthy  
151 - 200

Very Unhealthy  
201 - 300

Hazardous  
301 - 500

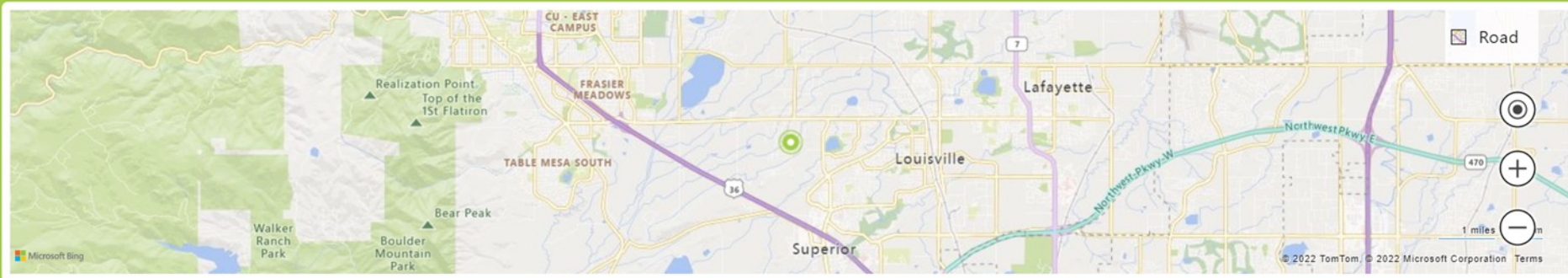
AQI Levels







AQI Levels



# Alerts!



Receive regional Air Quality updates via text notifications.

Phone \*

Sign Up / Login!



Receive regional Air Quality updates via email notifications.

Email Address \*

Sign Up / Login!

## AIR QUALITY ALERT

Monitor Location: Infinite Drive  
Date: 4/6/2022 5:47:15 AM  
Air quality level: Very Unhealthy  
Air quality reading: 3.00



**BOULDER COUNTY  
PUBLIC HEALTH**  
Opportunity for a healthy life

You are receiving this message because the air quality in the Marshall fire burn areas may be very unhealthy.

**Who Needs to be Concerned?** Everyone

**Recommended actions**

**Sensitive groups:** Avoid all physical activity outdoors. Move activities indoors or reschedule to a time when air quality is better.

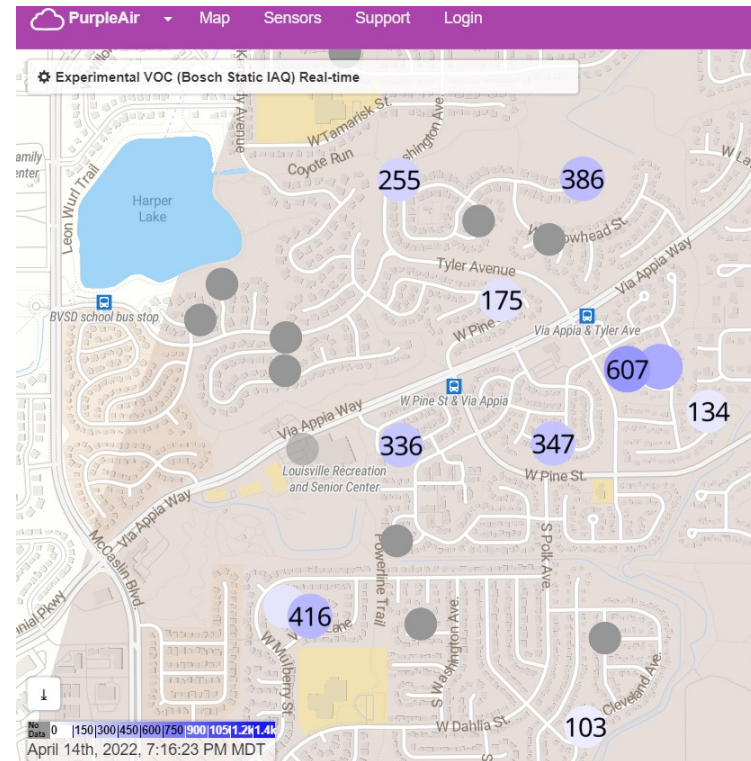
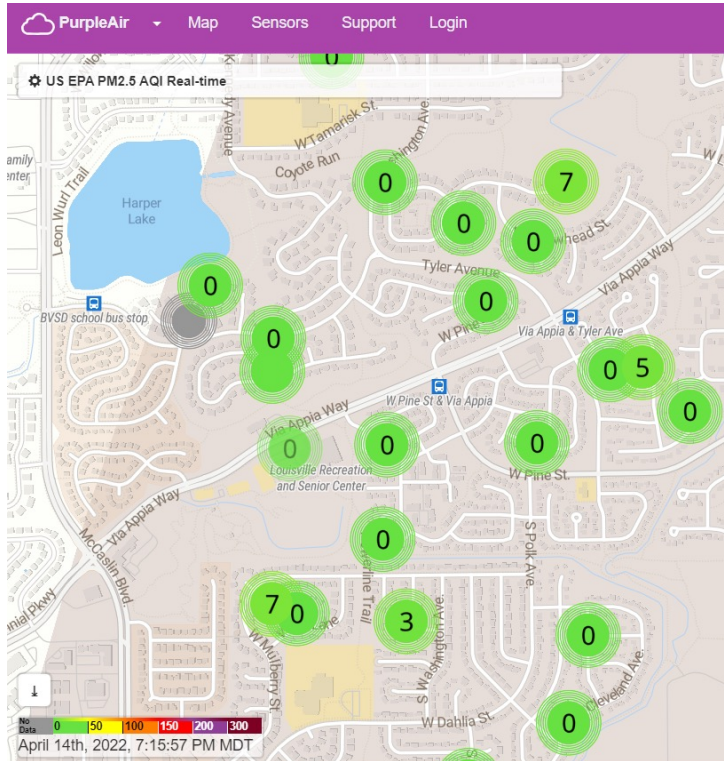
**Everyone else:** Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling to a time when air quality is better.

**Review the most recent data**

**AirQuality**  
303.441.1100  
AQ@bouldercounty.com

To change your notification preferences, [click here](#).  
Alerts powered by [twilio](#).

# Low-Cost Monitors

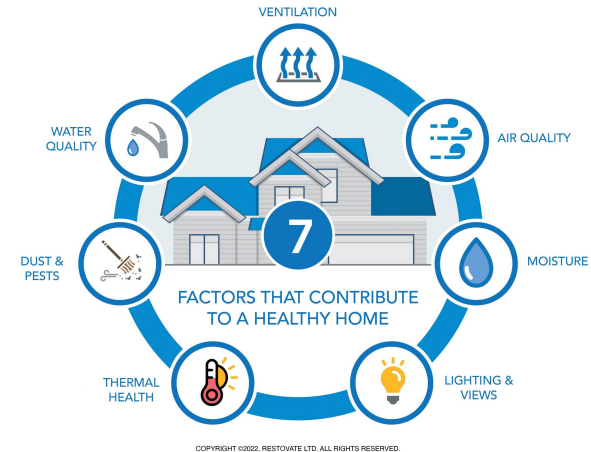


# Low-Cost Monitors



# Industrial Hygienist Assistance

- Guidance for testing and interpreting test results
- Recommendations for remediation measures
- Providing information on potential health impacts from exposure to ash and air pollutants, and steps to reduce risk
- Consulting on utilizing HVAC systems and air filtration units to reduce indoor air pollutants
- Directing residents to air quality resources and how to use them (AirNow.gov, PurpleAir, Boulder County air monitoring)






# Soapbox Time



# Be Prepared

- Develop messaging BEFORE the emergency
  - Create a communications plan to disseminate messages
  - Have retainer contracts with environmental consultants, labs and remediation companies in place
  - Get regulations for remediation in place
  - Have monitors ready to deploy
- 

# Ask Me About Dirt



# Thank you!

**Bill Hayes, PE**

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303-441-1574

