



# Changes to the PM<sub>2.5</sub> Air Quality Standard and How it Affects NH

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2024 NH Environmental Regulatory Conference  
September 10, 2024



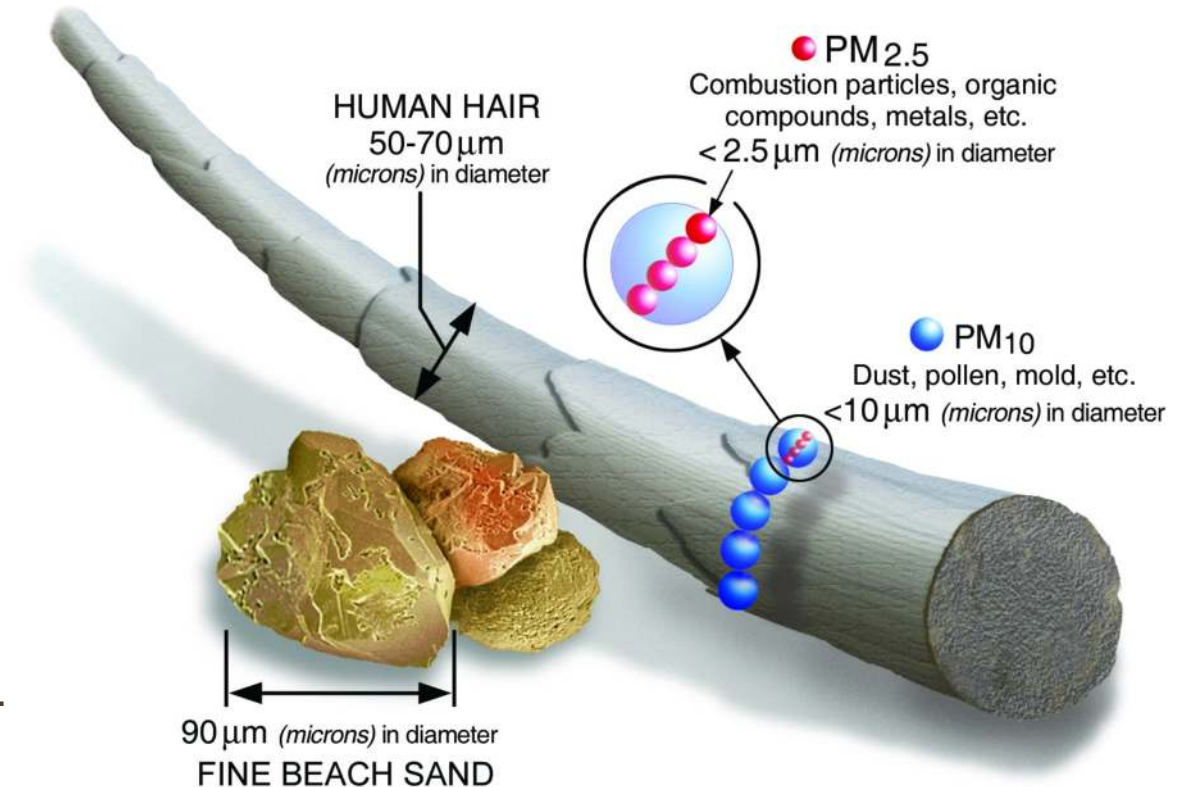
# What is PM<sub>2.5</sub>?

## PM = Particulate Matter (Particle Pollution)

- Pollutant that is either directly emitted or formed through complex chemical reactions
- Mixture of solid particles and liquid droplets
- Can be very small and therefore, inhaled → PM<sub>2.5</sub>

2.5 = 2.5 micrometers or less in diameter

- Fine Inhalable Particles
- Combustion Particles, Organic Compounds, Metals, etc.



# Woodsmoke



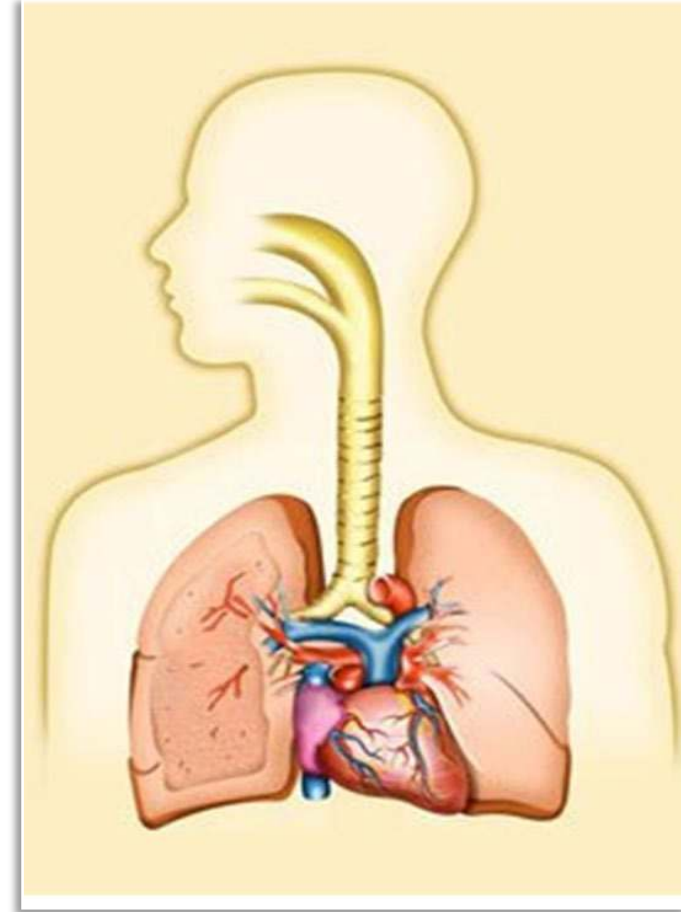
# Wildfires



# PM<sub>2.5</sub> Health Effects: *General Population*

## PM<sub>2.5</sub>

- Incredibly small and can be inhaled deep into the respiratory tract leading to numerous health effects
- Can get into the bloodstream
- Health effects include:
  - Decreased lung function
  - Irregular heartbeat
  - Nonfatal heart attacks
  - Aggravated asthma



# PM<sub>2.5</sub> Health Effects: *Sensitive Groups*

## Sensitive Groups Include:

- People with lung or heart diseases
- Older Adults
- Children

## Additional Health effects include:

- Narrowing of Airways
- Decreased Airflow
- Excessive Mucus Production
- Increase in Medication Usage
- Increase in Asthma Attacks
- Increase in Hospitalizations and ER visits



# National Ambient Air Quality Standards (NAAQS)



## PM<sub>2.5</sub>

24 hour averaging time (midnight to midnight)

- NAAQS: 35  $\mu\text{g}/\text{m}^3$

Annual Average

- NAAQS: 12  $\mu\text{g}/\text{m}^3$

# Exceedance vs. Violation

## Exceedance

- The 24hr average goes over 35 ug/m<sup>3</sup>
- The annual average goes over 12ug/m<sup>3</sup>

## Violation

- NAAQS compared to the Design Value:
- The 3-year average of the 98<sup>th</sup> percentile is >35ug/m<sup>3</sup>
- The 3-year annual mean average is >12ug/m<sup>3</sup>

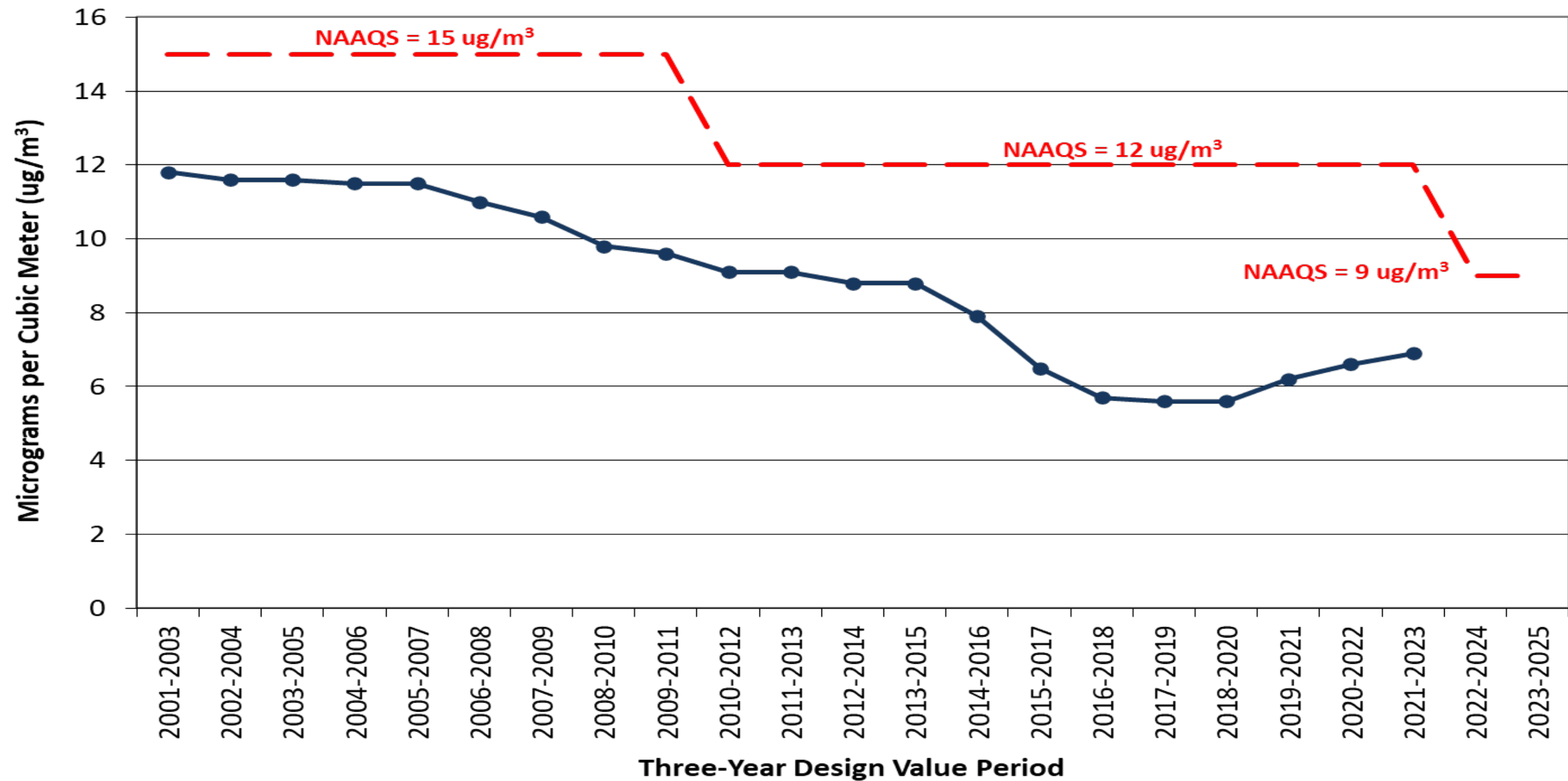
# Recent Change to the PM<sub>2.5</sub> NAAQS

Went into affect May 6<sup>th</sup>, 2024

## Annual Average

- Dropped from 12ug/m<sup>3</sup> to 9 ug/m<sup>3</sup>

# New Hampshire Maximum Annual Fine Particulate Matter Design Values



# Recent Change to the PM<sub>2.5</sub> NAAQS

Went into affect May 6<sup>th</sup>, 2024

24 hour averaging time (midnight to midnight)

- No changes
  - However, the 24hr AQI breakpoints changed

# Air Quality Index (AQI)



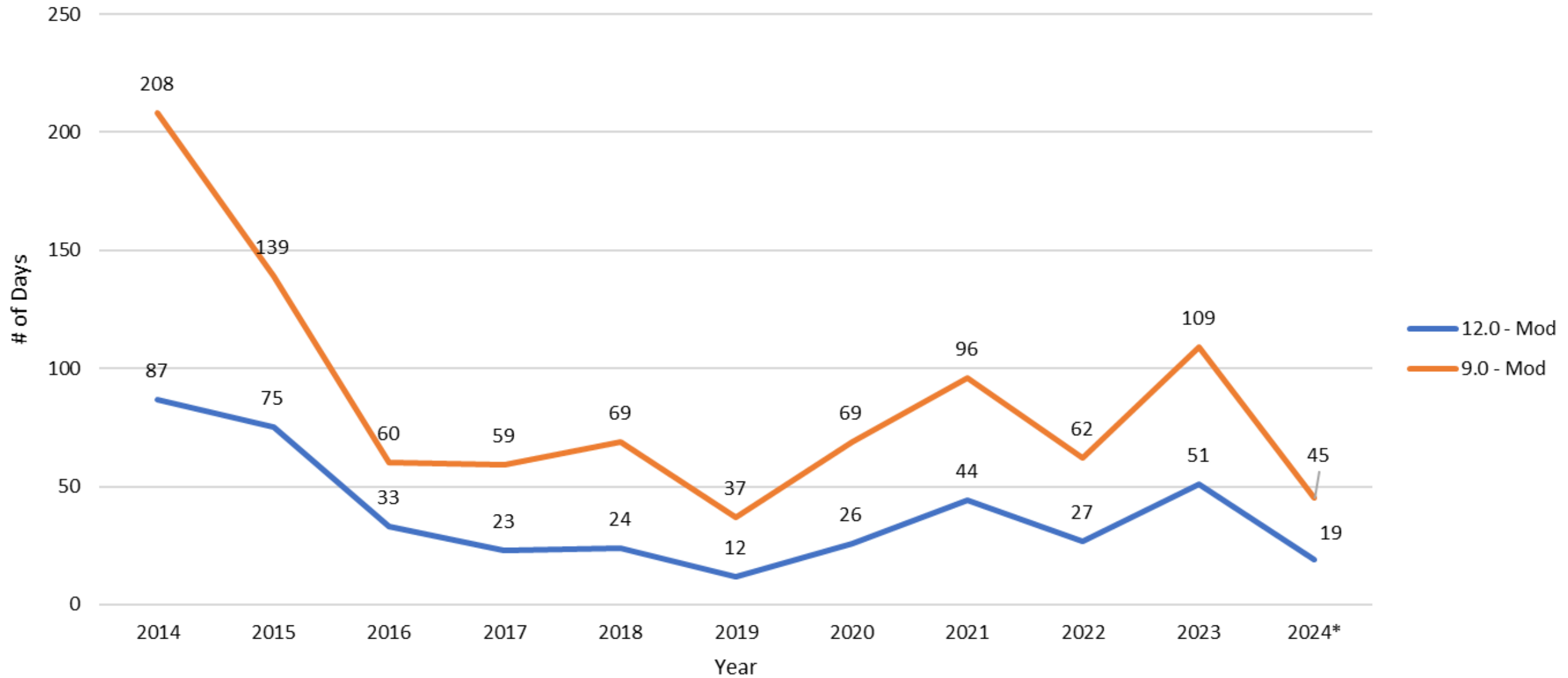
## AQI Basics for Ozone and Particle Pollution

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

AQI Category and Index Value	Previous AQI Category Breakpoints	Updated AQI Category Breakpoints	What changed?
<b>Good</b> (0 – 50)	0.0 to 12.0	0.0 to 9.0	EPA updated the breakpoint between Good and Moderate to reflect the updated annual standard of 9 micrograms per cubic meter
<b>Moderate</b> (51 – 100)	12.1 to 35.4	9.1 to 35.4	
<b>Unhealthy for Sensitive Groups</b> (101 – 150)	35.5 to 55.4	35.5 to 55.4	No change, because EPA retained the 24-hour fine PM standard of 35 micrograms per cubic meter.
<b>Unhealthy</b> (151 – 200)	55.5 to 150.4	55.5 to 125.4	EPA updated the breakpoints at the upper end of the unhealthy, very unhealthy, and hazardous categories based on scientific evidence about particle pollution and health. The Agency also combined two sets of breakpoints for the Hazardous category into one.
<b>Very Unhealthy</b> (201 – 300)	150.5 to 250.4	125.5 to 225.4	
<b>Hazardous</b> (301+)	250.5 to 350.4 and 350.5 to 500	225.5+	



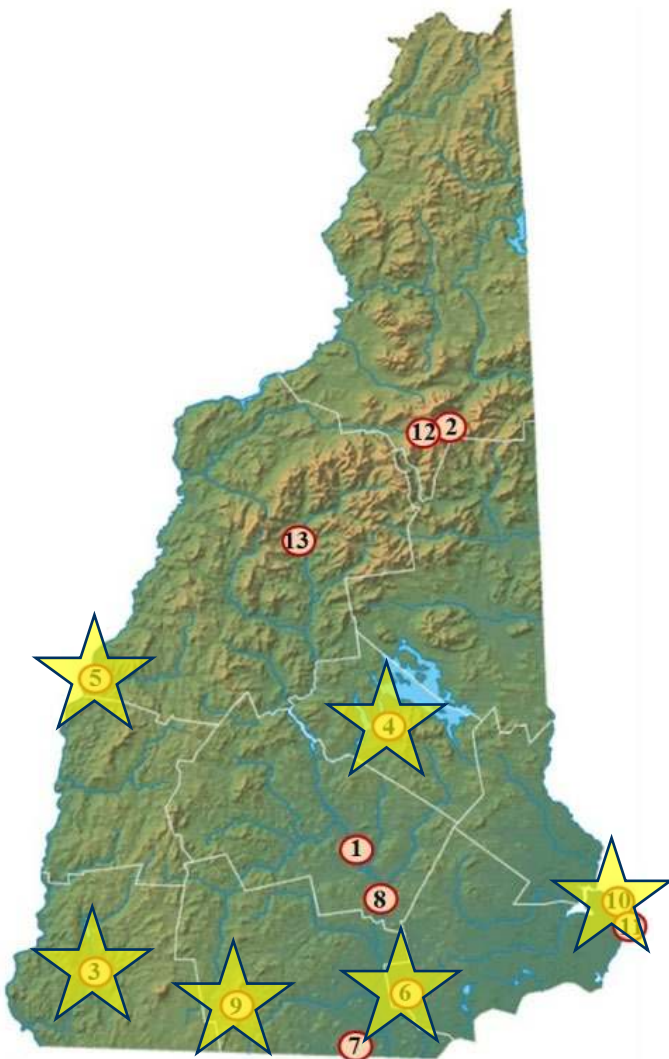
# of Days With at Least One County in the Moderate Range



\* 2024 data through 8/27/24



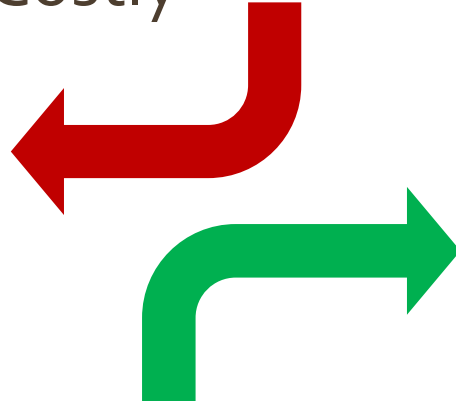
NEW HAMPSHIRE  
DEPARTMENT OF  
**Environmental  
Services**

[illegible]

# Supplemental Monitoring



- EPA Compliant
- Testing & Criteria
- Costly



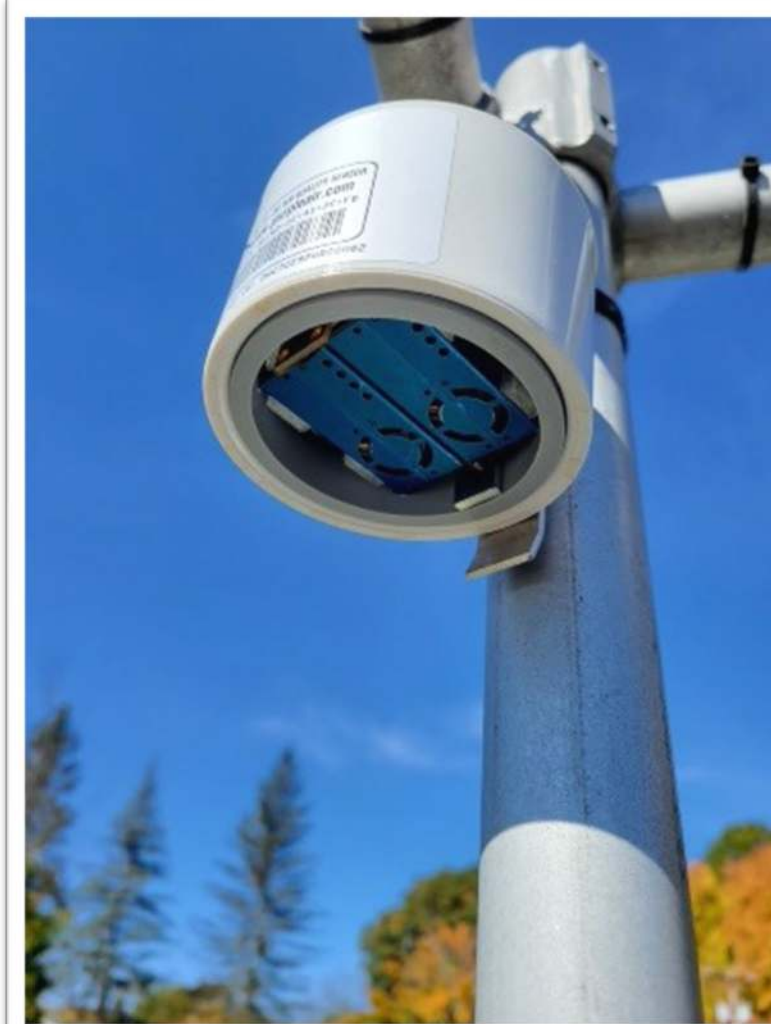
- Easy to Use
- Effective
- Affordable





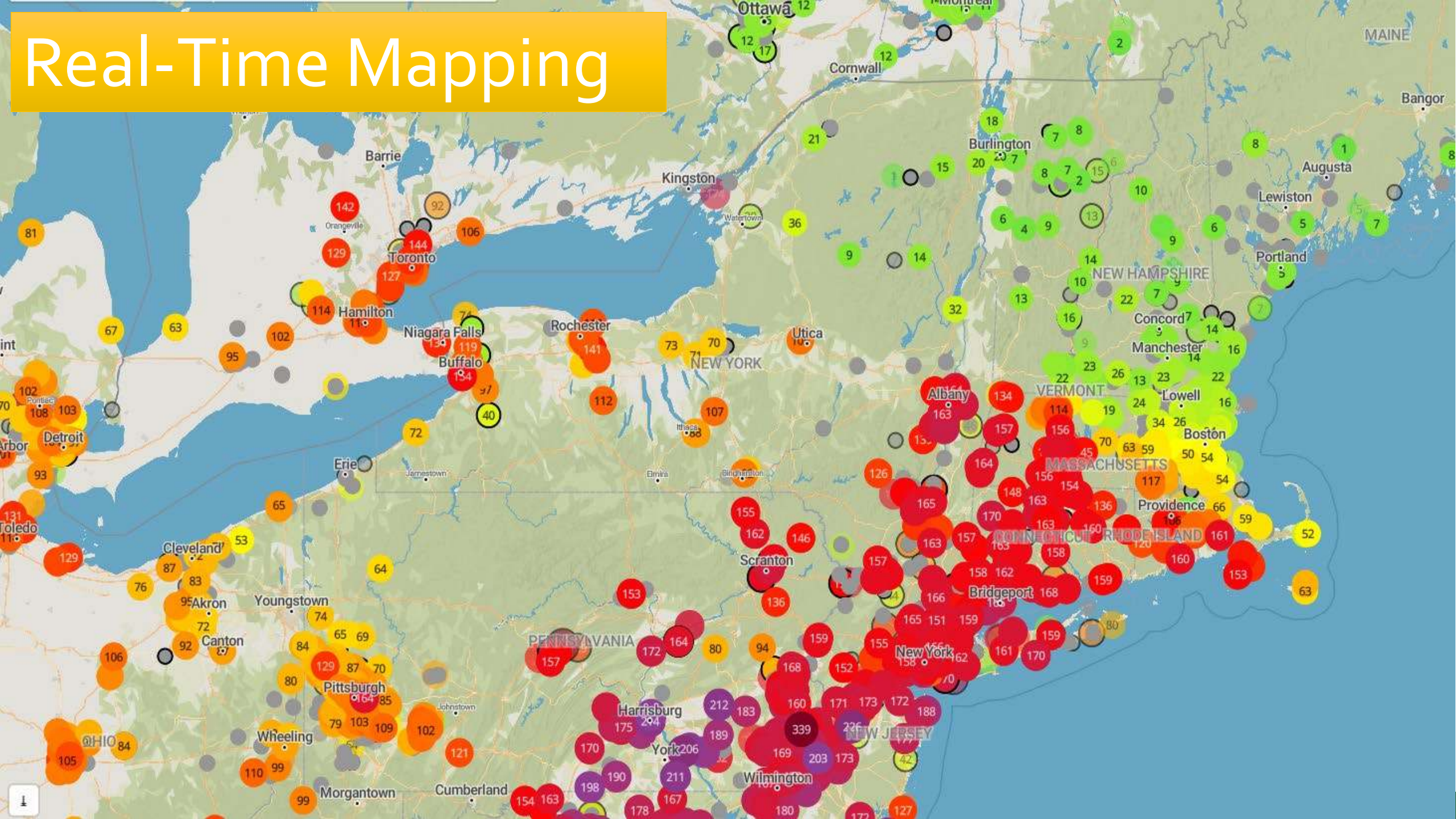
# Citizen Scientist PM<sub>2.5</sub> Monitoring

# PurpleAir Particle Sensors



- Laser particle counters
- Dual PM sensors
- Temp & humidity sensor
- 2-minute averaging
- Wi-Fi connectivity

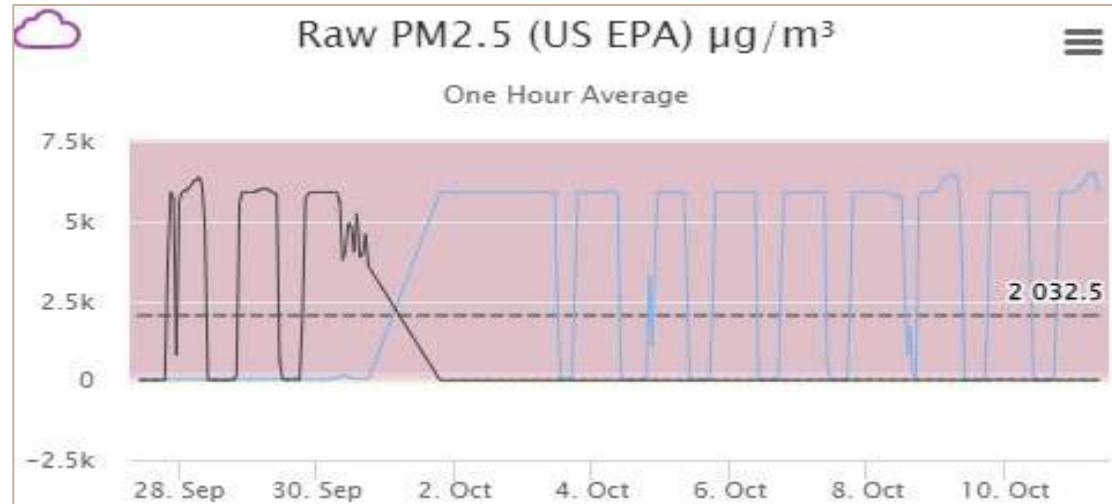
# Real-Time Mapping



# Data Trustworthiness



- Minimal quality assurance
- Many unknowns
  - Setup
  - Location, location, location



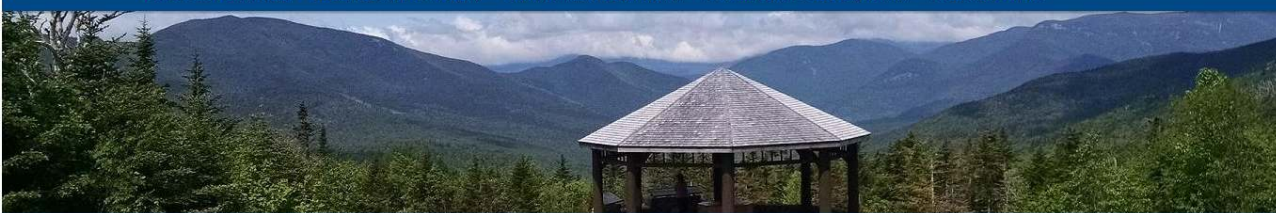
# NHDES Citizen Air Monitoring Program



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## Citizen Air Monitoring Program

*Monitoring for fine particulate matter throughout New Hampshire using PurpleAir sensors.*

Fine particulate matter (PM2.5) is one of the most pervasive and widespread air pollutants in New Hampshire. These small particles come from many sources, but woodsmoke is the primary driver for elevated concentrations in the Granite State due to the common practice of burning wood for residential heating. Though considerable progress has been made in reducing PM2.5 from woodsmoke, largely in part to newer EPA certified wood stoves entering the market, there still exists room for continued improvement. In order to make additional progress in lowering PM2.5 levels, it is important to understand what current levels are, which can be done through monitoring. Currently, there are six PM2.5 monitoring stations throughout New Hampshire that are owned and operated by NHDES, but there are many areas of the state that are not covered by this monitoring.

Thanks to modern technology and initiatives to improve air quality, effective low-cost air quality sensors have come into the market, including PurpleAir monitors. PurpleAir is a private company that makes air quality sensors available for the public, measuring PM2.5 and providing local air quality data at an affordable cost. The unit is easy to install, and information is uploaded every 10 minutes to an online, publicly available map. Data provided can help households, businesses and municipalities better understand their local air quality.

## Related Content

[PurpleAir](#)

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## PurpleAir Sensor Registration

VERSION 1.2

### INSTRUCTIONS

NHDES-A-04-001

10/5/22

Voluntary

Your personal information will not be published, sold, or used in any way. You may opt out of contact and/or the program at any time after you register.

Should we come across any issues with your registration or any data quality concerns, communication will be vital to ensure your sensor remains part of our citizen science network. Nonetheless, you may opt out of communication in this form.

Click the "Begin Form Entry" link to register your device and become a citizen scientist.



Begin Form Entry

<https://www.des.nh.gov/home-and-recreation/air-quality/citizen-air-monitoring-program>

# Benefits of Joining CAMP



Voluntary and Free!

Installation  
Guidance

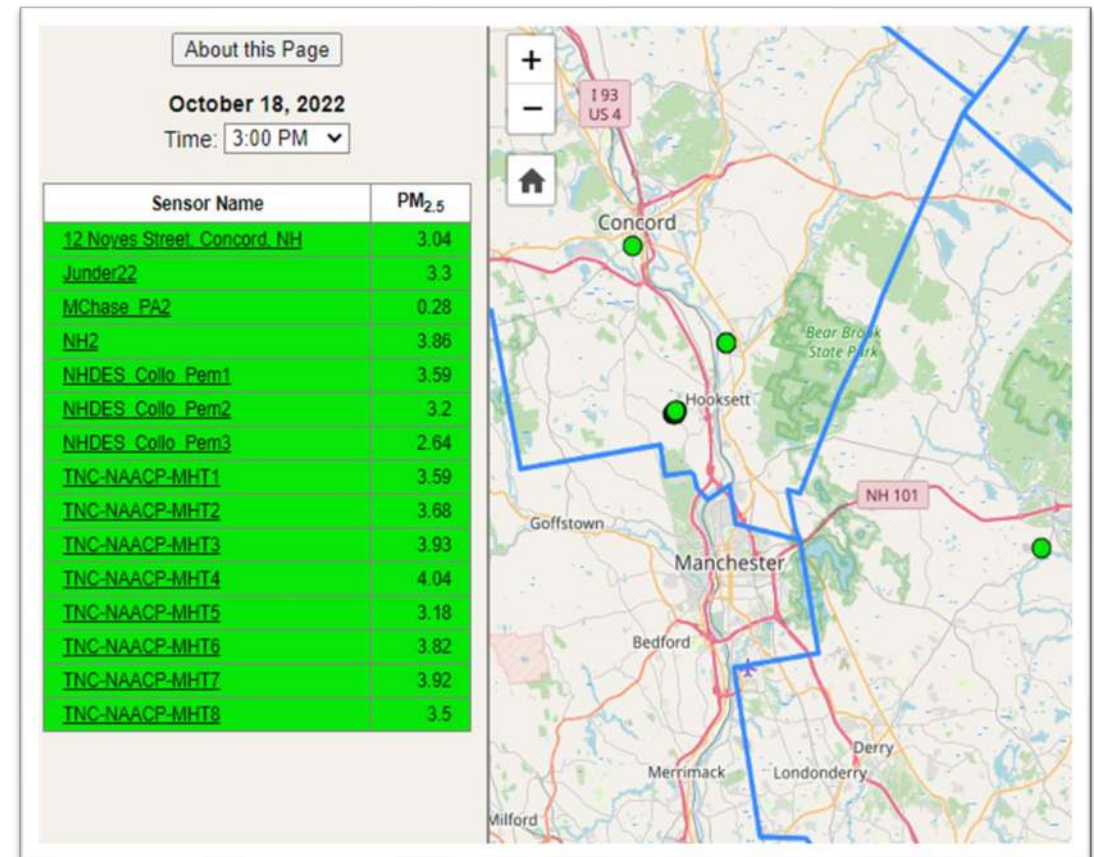
Quality Assured  
Data

Data-Correction

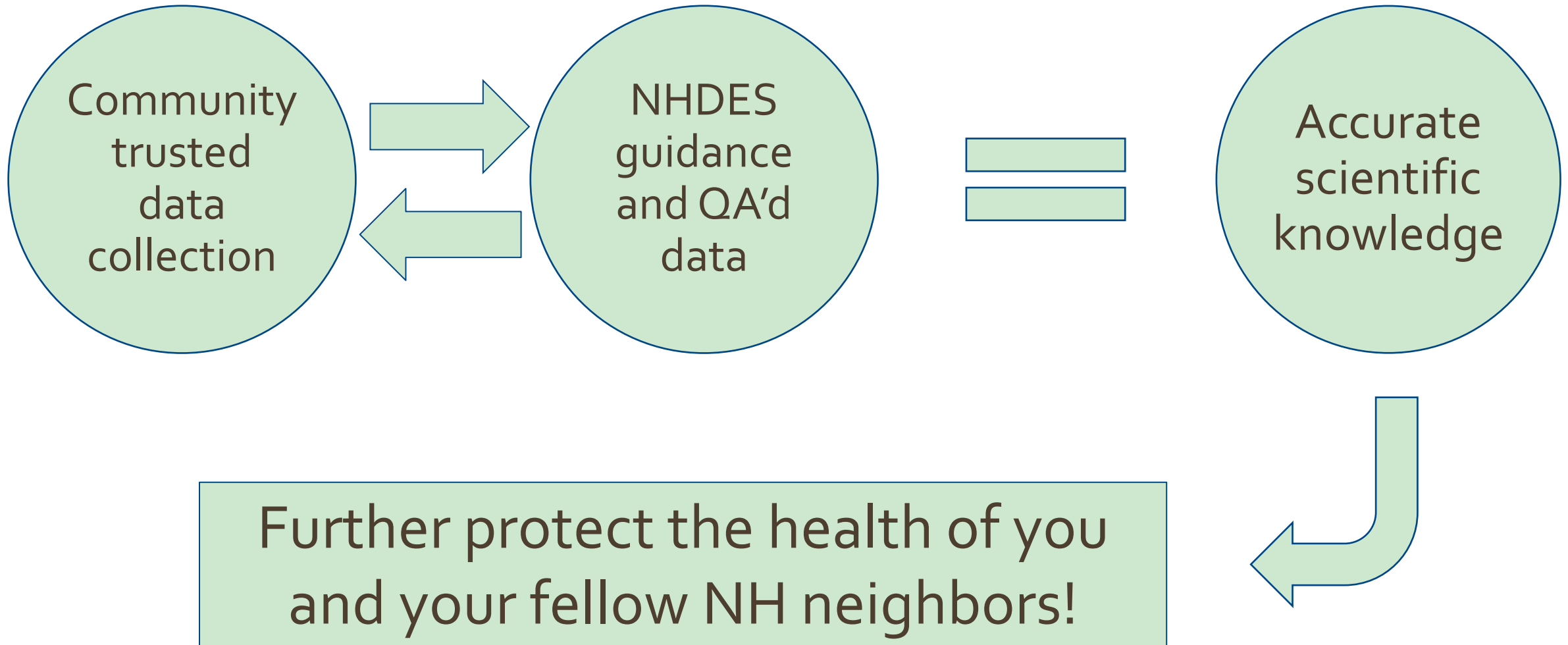
NHDES Live  
Map

Access to  
Archived Data

Troubleshooting  
Assistance



# Collaboration is a Win-Win!





# Thank you

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