BLOG

Why is Air Quality in Schools So Bad? How Real-Time AQI Monitoring Can Fix It

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Would you let students run laps in a smoke-filled gym? Of course not. But what the air seems clear while pollutants are puffing students at risk?

Most schools rely on general AQI reports that can be outdated or miles away, leaving them unaware of harmful pollutants like Ozone, Nitrogen Dioxide, wildfires, smoke, industrial pollution, and high pollen counts can cause PM2.5, PM10, and ozone levels to spike—posing serious health risks to students and staff.

So, why is school air quality so bad and what can schools do to take action to stay protected?

At Perry Weather, we help schools monitor and act on real-time air quality data. We're here to clear the air—here's what you need to know about how to improve air quality in schools—and how to stay ahead of AQI challenges.

3 Signs Air Quality in Your School is a Problem

Your school's outdoor environment might look clear, but air pollution could be silently affecting students and staff.

Here are three key signs that your school's poor air quality might be causing health issues:

1. Symptoms Worsen at School, Improve Elsewhere

If students feel sick at school but fine elsewhere, poor air quality and pollutants like PM2.5 and PM10 may be to blame.

- More coughing, sneezing, and itchy eyes during recess or PE?
- More reports of allergies, fatigue or shortness of breath?
- A spike in asthma inhaler use?

What It Means: Pollutants like PM2.5, PM10, and ozone might be at unhealthy levels and air quality testing is critical. It could also indicate HVAC air quality issues.

Installing an air quality monitoring device like Tzero Monitor can help you track these major pollutants, and help keep your students and staff safe.

2. Symptoms Spike When HVAC Systems Turn On

If students start coughing the moment the heat or AC kicks on, something's wrong.

- Musty or moldy smells in classrooms
- Dry, irritated eyes and skin rashes
- Sudden discomfort when the air conditioning or heating turns on

What It Means: Mold, dust, and dirty HVAC filters are likely recirculating harmful pollutants throughout the school.

3. Sports & Outdoor Activities Are Impacted

Outdoor air quality isn't just about comfort—it affects athletic performance and safety.

- Athletes struggling to catch their breath or experiencing tightness in their chest
- Frequent rescheduling or canceling of outdoor events

What It Means: Schools need real-time air quality monitoring from a trusted source like Perry Weather to make data-driven decisions about PE, practice, and game schedules.

Before we learn what it takes to improve air quality at your school, let's break down what these pollutants are and where they come from.

What's in the Air?: Air Pollutants Explained

The Invisible Threat: What Is PM2.5?

Imagine a particle so small that 30 of them could fit across a single strand of hair—that's PM2.5.

What is it?

PM stands for particulate matter, which are basically microscopic particles or droplets in the air. The number 2.5 refers to size—2.5 micrometers or smaller—so they can bypass the body's defenses, penetrate deep into the lungs, and enter the bloodstream.

How is PM2.5 Detected?

Optical and Beta-based PM2.5 sensors detect this pollutant by drawing in ambient air and counting the number and size of particles present.

Where does PM2.5 come from?

- Wildfire smoke
- Vehicle emissions
- Industrial pollution
- Power plants

Why Schools Should Care

Even short-term spikes in PM2.5 can increase asthma-related ER visits by 15%. Long-term exposure is linked to lung disease, heart disease, and cognitive decline.

The Irritating Airborne Pollutant: What Is PM10?

PM10 particles are larger (up to 10 micrometers) but still small enough to be inhaled. PM10 particles are more likely to get trapped in the nose and throat, but don't reach deep lung tissue.

Where does PM10 come from?

- Dust from construction sites
- Pollen from trees and grass
- Agricultural dust
- Road traffic

Why Schools Should Care

PM10 exposure increases allergy flare-ups and worsens respiratory conditions.

PM2.5 vs. PM10: What's the Difference?

The key difference between PM2.5 and PM10 lies in their size and how deeply they can penetrate the respiratory system. They also have different sources and chemical compositions.

Category	PM2.5	PM10
Size	Smaller than 2.5 micrometers (µm)	Smaller than 10 micrometers (µm)
What It Is	Fine, invisible particles in the air	Larger, more visible dust and debris in the air
Outdoor Sources	Burning fossil fuels (cars, trucks, power plants), wildfires, industrial pollution	Road dust, construction, farming, industrial sites, road salts
Indoor Sources	Smoking, cooking, incense burning, household cleaning products	Dust from carpets, furniture, bedding, pet dander, cleaning activities
Health Impacts	Can reach deep into the lungs, enter the bloodstream, and cause serious health issues, such as heart attacks	Can cause coughing and irritation, but usually gets trapped in the nose and throat

Ozone: A Respiratory Risk

Ozone (O3) is a gas, not a particle, and while it protects us from harmful UV radiation high in the atmosphere, it becomes a serious respiratory hazard at ground level. It forms when car exhaust, power plant emissions, and industrial pollutants react with sunlight.

Where does it come from?

- Industrial facilities
- Car and truck emissions
- Power plants

Why Schools Should Care

Ozone can reduce lung function, trigger asthma attacks, and cause long-term respiratory damage—especially on hot, sunny days when students are outdoors.

5 Steps Schools Can Take to Improve Air Quality (And How Perry Weather Helps)

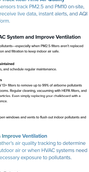
Fighting poor indoor air quality. And yet, most schools don't realize their air quality might be making it worse.

PM2.5 indoor and outdoor levels can vary significantly due to poor ventilation and pollutants from various sources. Fresh classroom dust to outdoor pollution seeping in.

The good news? Schools can take proactive steps to reduce exposure to PM2.5 and PM10 and create safer and healthier school environments.

Step 1: Monitor Air Quality in Real Time

City-wide AQI reports don't tell the full story—air quality can change drastically between neighborhoods and even between buildings on campus.



- **Use a PM2.5 monitor and air quality detector**
  Invest in the best air quality monitors to track PM2.5, PM10, and ozone in real time at your exact location—not miles away.
- **Check PM2.5 indoor levels**
  Perform regular air quality testing in schools and identify pollution spikes before they become a health risk.

How Perry Weather Helps Track Real-Time Air Quality

Perry Weather's real-time sensors track PM2.5 and PM10 on-site, not just city-wide. Schools receive live data, instant alerts, and AQI integration—all in one platform.

Step 2: Upgrade your HVAC System and Improve Ventilation

HVAC systems can trap and circulate pollutants—especially when PM2.5 filters aren't replaced regularly. Schools need proper ventilation and filtration to keep indoor air safe.

- **Ensure HVAC Systems Are Well-Maintained**
  Clean ducts, replace PM2.5 air filters, and schedule regular maintenance.
- **Install High-Efficiency PM2.5 Filters**
  Use HEPA-rated HVAC or MERV-13+ filters to remove up to 99% of airborne pollutants before they circulate through classrooms. Regular cleaning, vacuuming with HEPA filters, and maintenance prevent dust buildup. Even simply replacing your mudroom with a sidewalk can make a huge difference.
- **Increase Fresh Air Circulation**
  When outdoor air quality is good, open windows and vents to flush out indoor pollutants and increase air exchange rates.

How Perry Weather Helps Improve Ventilation

Schools can use Perry Weather's air quality tracking to determine when it's safe to bring in outdoor air or when HVAC systems need adjusting—preventing unnecessary exposure to pollutants.

Step 3: Reduce Outdoor Pollutants

Industrial activity, as well as combustion from vehicles and wildfires contribute to outdoor pollution near schools. Schools should:

- **Limit Combustion Sources:** Reduce idling vehicles near schools and use electric or low-emission alternatives.
- **Use Low-VOC Cleaning Supplies:** Many schools rely on industrial-strength disinfectants and sprays that release volatile organic compounds (VOCs) and PM2.5 particles into the air and sensors air quality.

How Perry Weather Helps Reduce Outdoor Pollutants:

By tracking PM2.5 and PM10 indoors and outdoors, Perry Weather helps schools pinpoint where pollutants are accumulating and adjust cleaning schedules and HVAC settings accordingly.

Step 4: Adjust Outdoor Activity Based on AQI

Air quality fluctuates daily but hits especially during traffic jam peak days, or peak traffic times. Schools need live AQI data to decide when it's safe for recess, PE, and outdoor sports.

Rule	California Air Quality Resources Board (CARB) Recommendations
Daily Monitoring for Schools	Schools should monitor the air quality throughout the day and probably every hour.
Limit Transitions for Activity Restrictions	Ideally, moderate exercise was restricted at AQI Index of 150 or above. However, this recommendation was changed to 175 before the transition to outdoor activity when air quality begins to improve.
Move Outdoor Activity Indoorsmore	When the AQI reaches moderate (around or higher levels, schools should: • Reduce or recommend strenuous outdoor activities. • Encourage students to take breaks from strenuous activity. • Encourage students to take additional hydration breaks because of the potential for increased respiratory effect.
Focus on PM2.5	• PM2.5 is a major health concern as it can penetrate deep into the lungs. The non-gaseous nature since activity restrictions were PM2.5 levels are high.
Ensure Proper Implementation	• Schools should develop air quality action plans outlining procedures for monitoring air quality and adjusting outdoor activities based on AQI levels.

- **Follow State & District Air Quality Guidelines for Schools:** Modify outdoor activities when AQI is poor, even if school officially remains open.
- **Set Thresholds for Sports Cancellations:** Many schools cancel outdoor events if AQI exceeds 150.
- **Check PM2.5 Indoor vs Outdoor Levels:** Sometimes, staying inside isn't better—track outdoor and indoor air quality to make the safest decision.

How Perry Weather Helps Stay AQI-Policy Compliant

Perry Weather sends custom and automated alerts when AQI starts so schools can instantly adjust outdoor activity plans and notify staff immediately.

Step 5: Use Strategic Landscaping to Filter Outdoor Pollution

School campuses can naturally reduce pollution by using trees, shrubs, and barriers to filter out PM10 and airborne emissions.

- **Plant Trees & Shrubs:** Green spaces absorb pollutants and reduce PM10 levels near playgrounds.
- **Position AQ Sensors Near Trees:** This helps reduce exposure to wildfire emissions.
- **Create Buffer Zones Between Traffic & Play Areas:** Reducing exposure to outdoor pollutants keeps students healthier.

How Perry Weather Helps Filter Outdoor Pollution

Perry Weather's AQI data helps schools identify pollution hotspots and adjust landscaping strategies to improve air quality where it matters most.

Air quality monitoring doesn't have to be complicated—with Perry Weather's real-time tracking, proactive alerts, and automated policy integration, schools can create a healthier, safer environment for students and staff.

Why Schools Trust Perry Weather for Air Quality Monitoring

With Perry Weather, schools gain insect visibility into their air quality, allowing them to take proactive measures to keep students and staff safe, now & future.

Real-Time Air Quality Tracking: See What's in the Air—Right Now

Air quality changes fast—especially in California, which sails a mile away can be dangerous on your campus. Outdated data won't cut it—schools need real-time insights to make the right call.

Traditional AQI reports rely on 24-hour averages, often failing to capture sudden spikes in pollution due to wildfires, industrial emissions, or weather changes.

- **Monitor PM2.5, PM10, & Ozone (O3) Levels:** Protect your campus with real-time air quality data tracking key pollutants, including PM2.5 and PM10 levels, as well as the Ground Ozone (O3) level.
- **Superior Optical Sensors:**
  Perry Weather's PM2.5 and PM10 sensors use optical-based sensors instead of Beta Meters to provide faster, more accurate data—up to 10 times faster than Beta Meters.
  Perry Weather sensors undergo extensive quality control and calibration to ensure optimum accuracy.
  These sensors are easier to maintain than Beta-based sensors and detect pollution spikes instantly.
- **OpenAQ Integration:** For expanded ozone pollution tracking, Perry Weather also seamlessly integrates with OpenAQ, a nationwide air quality network with high-density coverage—allowing schools to monitor all major pollutants that impact air quality in Santa Ana (AQI).
- **Custom Public-Facing AQI Widgets:** Schools can display real-time air quality data on custom public-facing widgets, so parents and staff can access current air quality conditions at a glance.

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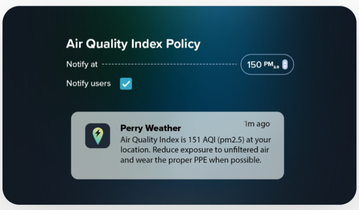
guidelines, so you take the right action at the right time.

- **Get Instant Policy-Based Notifications:** When pollution levels exceed the set threshold, Perry Weather automatically notifies key decision-makers. Notifications can be sent directly to school staff, keeping everyone informed.



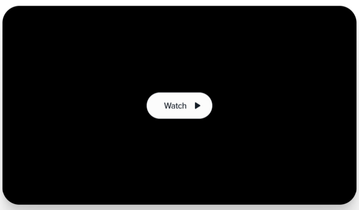
Seamless Integration with School Safety Policies

Perry Weather is designed to integrate with existing school safety protocols and state air quality regulations.

- Automatically align alerts with district, state, or organizational safety guidelines. These alerts help schools decide when to adjust recess, PE, and outdoor sports schedules based on actual air quality conditions, not just forecasted data.
- Get automated reporting for compliance with air quality policies—reducing administrative workload while keeping students safe.

The Perry Weather Impact: How Loyola High School Uses Perry Weather During Wildfire Season

Loyola High School in California relied on Perry Weather to track air quality during wildfire season to detect dangerous PM2.5 levels, prompting administrators to reschedule activities in advance—protecting students from potential respiratory harm.



"The problem with other phone apps is that you're getting a 24-hour average of the air quality.

With Perry Weather, we get the air quality as it is right now. When there's wildfire smoke in the area, our campus might have completely different conditions from the nearest monitoring station.

Having real-time, on-campus data makes a world of difference."

– Tim Moscicki, Head Athletic Trainer at Loyola High School

How Loyola High School Automates CIF Heat Stress Policy Compliance

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Take Control of Your School's Air Quality with Perry Weather

Air quality isn't just a background concern—it directly impacts student health, attendance, and athletic performance. Without real-time, location-specific data, schools are left guessing when to take action.

With Perry Weather, you don't have to guess. You get instant, accurate air quality insights right where they matter most—your campus.

- **Monitor air quality in real time**—track PM2.5, PM10, and ozone levels right at your campus, not miles away.
- **Get instant alerts**—automated notifications let you respond before air quality becomes a health hazard.
- **Make data-driven safety decisions**—adjust outdoor activities, HVAC systems, and safety protocols with data-driven confidence.
- **Stay compliant with district & state policies**—integrate AQI monitoring directly into school safety plans and meet district and state air quality requirements.
- **Plan long-term air quality strategies**—track historical trends to optimize ventilation, filtration, and exposure reduction.

With Perry Weather, schools can proactively take control of air quality monitoring and keep students safe—no guesswork, no outdated reports.

Ready to help your school breathe easier? Sign up for a free trial and see Perry Weather in action.

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