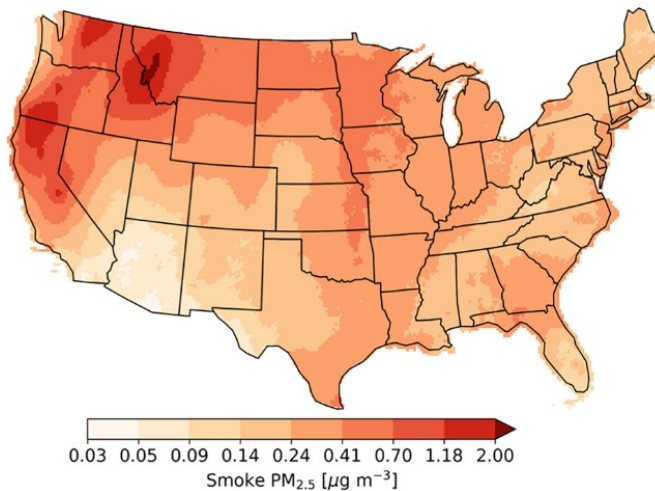


PurpleAirs in Schools Project

Free Air Sensors for your school to monitor Montana's air pollutant of concern: Particulate Matter (PM_{2.5})

Mean Smoke PM_{2.5} 2006-2018



Plot from O'Dell et al. 2021

Significance of Smoke Impacts in Montana

- Montanans are subjected to some of the highest concentrations of smoke-derived PM_{2.5} in the United States.
- Montana represents a high outlier for percentage of annual mortalities attributed to smoke exposure.
- Wildfires and smoke-attributed PM_{2.5} are expected to increase due to intensifying drought, warming due to climate change and forests heavily over-burdened with wildland fuels.
- Wildfire smoke can have negative health effects on students participating in back-to-school extracurricular activities such as outdoor sport practices and events.

We aim to empower all Montanans, including those living in our most rural and underserved communities, with knowledge and air quality data currently unavailable to them.

School and Student Benefits

1. Inform decision-making regarding the health and safety of students and athletes during poor air quality events.
 - For example, it can be difficult to decide whether it is safe to practice sports outside especially if the closest air monitor is a few towns away!
2. Improve preparedness for your school and community ahead of poor air quality events especially during fire season.
3. Give teachers, students, and parents real-time and historical data to learn about local air quality issues.
 - Provides opportunities for students to interact with real-world data and investigate the existent threat of smoke.
 - Build student engagement in the fields of science, data and web-based technologies, and environmental health.
4. Ensure future generations have access to local air quality information and awareness of public health risks.

Armed with air quality data and knowledge about the risks of smoke, Montanans can reduce their exposure to, and health effects associated with, smoke and PM_{2.5}

Requirements

- Install indoor and outdoor air quality sensors and connect them to the school's wifi.
 - Indoor sensor installed in science teacher's classroom.
 - Outdoor sensor installed anywhere there is power and good wifi connection.
- PurpleAir PM_{2.5} sensors are about the size of a grapefruit and simple to install.
 - The equipment along with guidance and continuous support will be provided.
- PurpleAir sensors are reliable enough to meet the needs of individuals, schools, and organizations for public health decision-making.

*There are **no** reporting requirements attached to this opportunity.

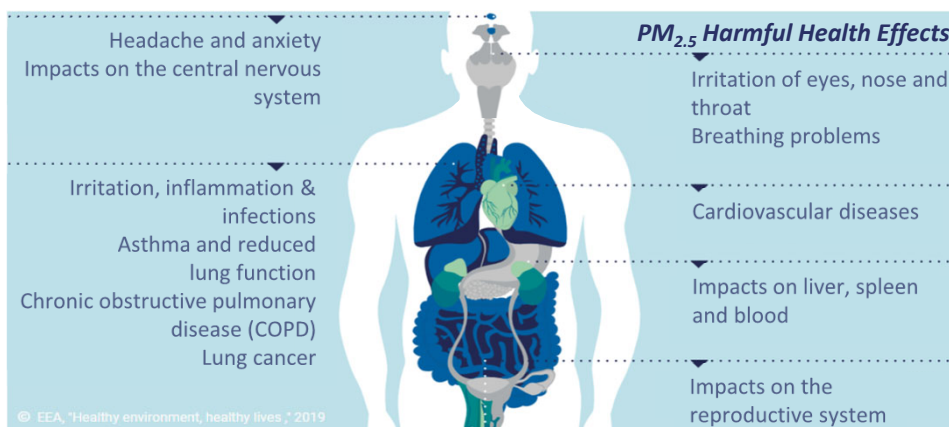


Image by: Seeley Swan Pathfinder

PurpleAirs in Schools Project

Free Air Sensors for your school to monitor Montana's air pollutant of concern: Particulate Matter (PM_{2.5})

PurpleAir Sensors Report the Air Quality Index

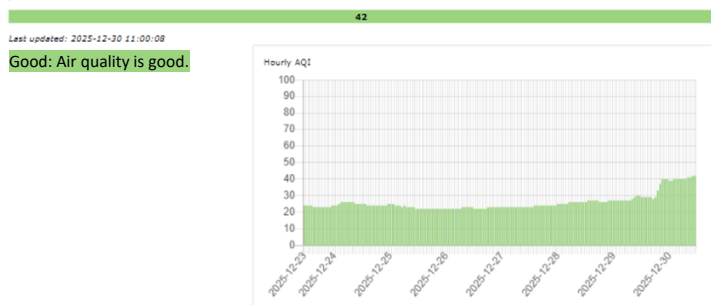
- Air quality index (AQI) is calculated from the measured PM_{2.5} concentration which is correlated to an AQI value.
- AQI value is on a scale of 0 to 500.
 - The lower the AQI value, the better the air quality.
- AQI index values reflect levels of health concern associated with exposure to PM_{2.5}.
- Ranges of health concern are communicated via color scale.

Health Effect Category	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy	Hazardous
Air Quality Index (AQI)	0-50	51-100	101-150	151-200	201-300	301+
Description of Air Quality	Air quality is good.	Air quality is acceptable. Students and staff unusually sensitive to air pollution may begin to notice health impacts.	Members of sensitive groups may experience adverse health effects. The general public is less likely to be affected. Sensitive groups include children, people with heart or lung conditions, older adults, pregnant women, and people who work outdoors.	Air pollution levels are unhealthy for everyone. Health effects on sensitive populations can be serious.	The risk of negative health effects is increased for the entire population.	Air pollution levels are harmful to all people. Anyone could experience serious health effects.
Recess or Other Outdoor Activity (15-30 minutes)	No limitations.	No limitations.	Students with chronic lung or heart conditions should minimize outdoor activity and retreat to an indoor clean air space if symptomatic.	All students should remain in clean indoor air spaces. Shut windows and doors. Activate indoor air purifiers.	Keep all students in clean indoor air spaces. Shut windows and doors. Indoor air purifiers should remain active and set to maximum rate.	Keep all students in clean indoor air spaces. Anyone could experience serious health effects. Indoor air purifiers should remain active and set to maximum rate.
Physical Education Class (1 hour)	No limitations.	Personal health of sensitive students should be monitored and vigorous outdoor activities may need to be limited.	Students with chronic lung or heart conditions should minimize outdoor activity and retreat to an indoor clean air space if symptomatic. Students with asthma, respiratory or cardiovascular illness should be medically managing their condition. Limit all students to light or moderate outdoor activities.	Conduct P.E. classes in clean indoor environments with good air quality. Limit all students to light or moderate indoor activities.	Conduct P.E. classes in an indoor environment with good air quality. Limit all students to light activities.	Stay indoors. Remain in indoor clean air spaces. Reschedule or relocate outdoor classes. Limit all students to light activities.
Athletic Events and Practices (2-4 hours)	No limitations.	Personal health of sensitive students should be monitored and vigorous outdoor activities may need to be limited.	Students with chronic lung or heart conditions should abstain from outdoor practices and events based on the severity of their condition and personal sensitivity to smoke. Consider moving practice and events into a clean indoor space if AQI is trending higher. Increase rest periods and substitutions to allow for lower breathing rates.	Reschedule outdoor events or relocate them to an area with good air quality. Conduct practices in clean indoor air environments. Limit all students to light indoor activities.	Reschedule/cancel events. Practices should only be held if an indoor environment with good air quality is available. Avoid vigorous indoor activities unless good indoor air quality is verified.	Stay indoors. Reschedule/cancel events. Remain in indoor clean air spaces. Cancel vigorous indoor activities unless good indoor air quality is verified.

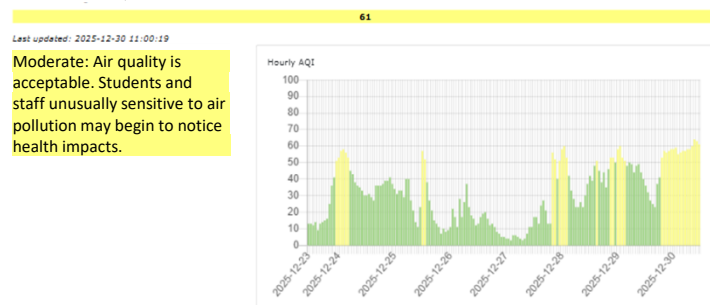
The PurpleAirs in Schools Air Quality Dashboard displays your school's current indoor and outdoor air quality conditions. The sensors provide real-time AQI Level of Health Concern as well as a plot of the Health Concern trends.

Air Quality Report for Your School

Indoor AQI



Outdoor AQI



Recommendations



To get your **free air sensors** or more information contact Keri Nauman at MT DEQ (406-444-6698 & keri.nauman@mt.gov)