



# Air, Climate, and Energy Research News

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January 2016

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## Studies examine air pollution susceptibility and risk factors

In studies published in a special issue of *Inhalation Toxicology*, EPA researchers explored why certain individuals are at greater risk for ozone impacts on the lungs and heart. The research found that animal models prone to cardiovascular disease are more likely to:

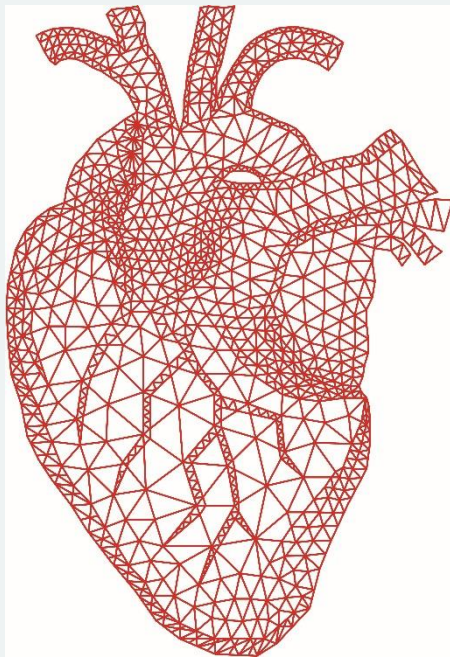
- Inhale a greater amount of pollution
- Have disproportionately higher lung damage because their heart condition impairs natural defenses against air pollution damage.

Genetic and other risk factors (e.g. obesity) were the main drivers responsible for the differences. The papers reveal key risk factors and imply some health strategies to reduce risk of air pollution mortality among those with cardiovascular disease.

Read an executive summary of the papers: [Variation in susceptibility to ozone-induced health effects in rodent models of cardiometabolic disease](#), published in *Inhalation Toxicology*.

Browse the full special Issue: [Air Pollutant Susceptibility and Contributing Risk Factors](#), published in *Inhalation Toxicology*.

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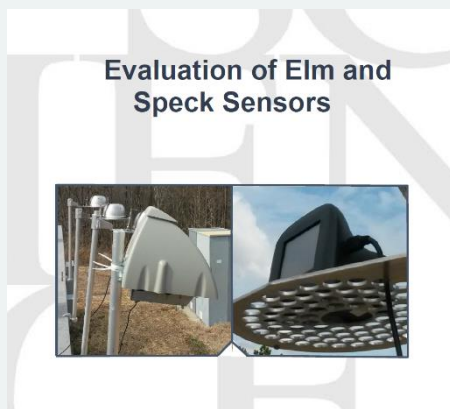
## Researchers use satellites to investigate PM exposure and heart disease

While many studies link long-term fine particulate matter (PM<sub>2.5</sub>) exposure and heart disease, most have used central-site air quality monitors to estimate a participant's exposure to pollution. In a recent study, researchers used satellite data—which can create more specific, localized estimates for an individual's exposure to air pollution—and demonstrated a correlation between long-term PM<sub>2.5</sub> exposures and greater risk of coronary artery disease and heart attacks. The improved accuracy of this method can help researchers investigate how other factors—like genetics, personal behavior, medical history, and gender—affect an individual's response to air pollution.

This study was a collaborative effort among EPA investigators and researchers from the Harvard Clean Air Research Center, University of North Carolina, Duke University, and the German Research Center for Environmental Health.

Read the paper:

[Association between satellite-based estimates of long-term PM<sub>2.5</sub> exposure and coronary artery disease](#), published in *Environmental Research*.



## New PM sensor evaluations available

Two air sensors that measure particulate matter (PM)—the Creative Labs' Speck and the PerkinElmer's Elm sensors—are the latest addition to EPA's [Air Sensor Toolbox for Citizen Scientists](#).

[Read the full evaluation report for the two particulate matter sensors.](#)



## Weather model update improves accuracy of precipitation

Air pollution, nutrient deposition, water quality, and climate are all affected by precipitation, in particular, at the local level. EPA, NASA, and academic researchers improved how clouds and precipitation are represented locally in the Weather Research and Forecasting Model (WRF). This model is often coupled with air

and climate models to study how weather interacts with air quality and longer-term climate trends.

Read the paper:

[Improving High-Resolution Weather Forecasts using the Weather Research and Forecasting \(WRF\) Model with an Updated Kain-Fritsch Scheme](#), published in *American Meteorological Society's Monthly Weather Review*



### **New federal methods measure carbon monoxide and ozone**

EPA recently approved two new commercially available air monitoring instruments for measuring ambient air quality, one for carbon monoxide and one for ozone. Instruments passing this evaluation meet EPA's strict air quality measurement criteria for accuracy, precision, specificity, freedom from interferences, comparability, and durability.

[Read the Federal Register notice.](#)

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## Key Links

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- [EPA's Air Research](#)
- [EPA's Climate Change Research](#)
- [EPA's Air, Climate, and Energy Research News – Past Issues](#)
  
- [Air-related blogs](#)
- [Climate-related blogs](#)