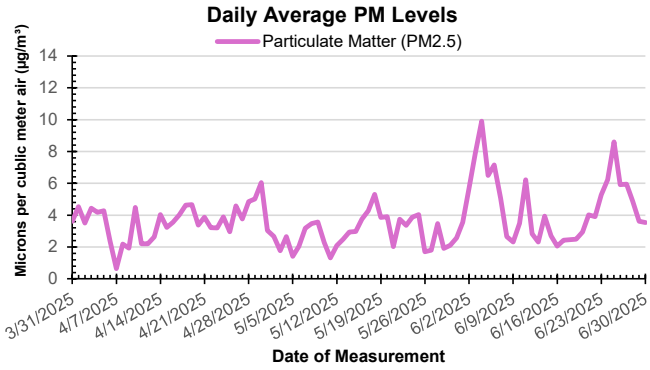
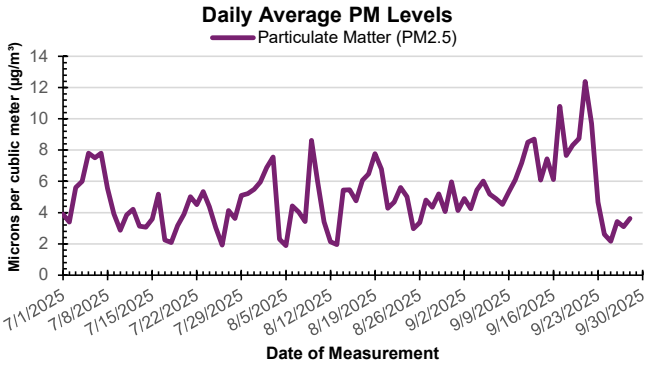
Air Quality Report: Epes, Alabama

July 1-September 30, 2025

Particulate matter ($PM_{2.5}$)

In general, particulate matter are microscopic solid or liquid particles that are suspended in the air. PM includes a wide range of substances, such as: dust, smoke, pollen, ash, bacteria, and viruses. We measure PM size 2.5 micrograms per cubic meter of air. We are interested in particles of this size because they can travel deep into the lungs, enter the bloodstream, and be distributed to various parts of our body. *"Good" $PM_{2.5}$ levels are 0.0-9.0 µg/m³, but 0-35.4 µg/m³ is acceptable by EPA standards.*

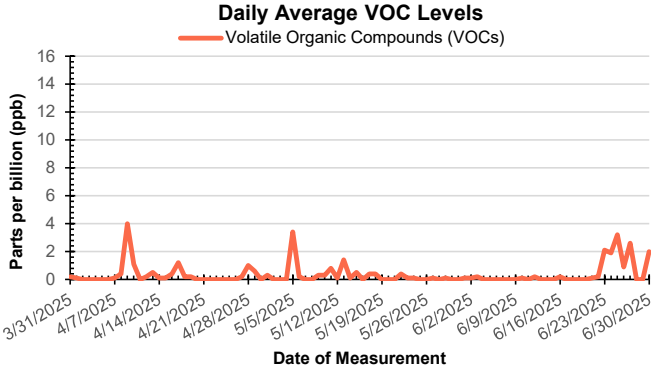


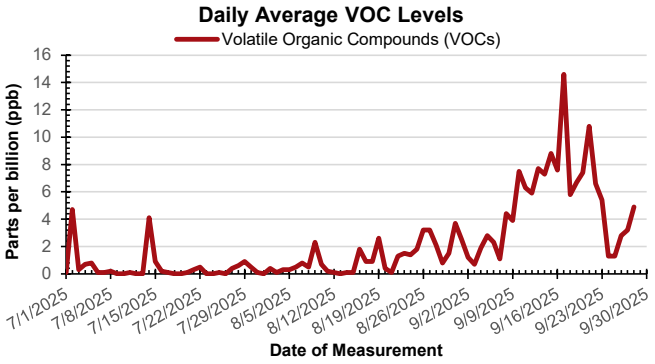


Total volatile organic compounds (VOCs)

VOCs are organic chemical compounds that easily evaporate at room temperature, meaning they turn into a gas. VOCs can be found in both indoor and outdoor environments. They can be released from furniture, everyday cleaning products, vehicles, and industrial processes.

VOC emissions include benzene, toluene, ethylbenzene, and xylene, which can be emitted during the wood pellet combustion process (especially when green wood is being dried). Aldehydes acetaldehyde, formaldehyde) can also be emitted if additives or binding agents are used in the wood pellet production process.



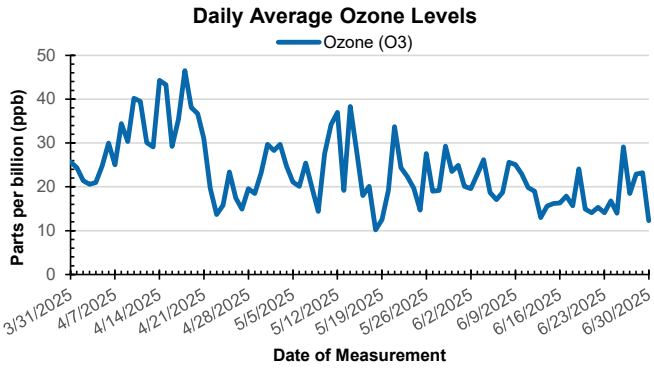


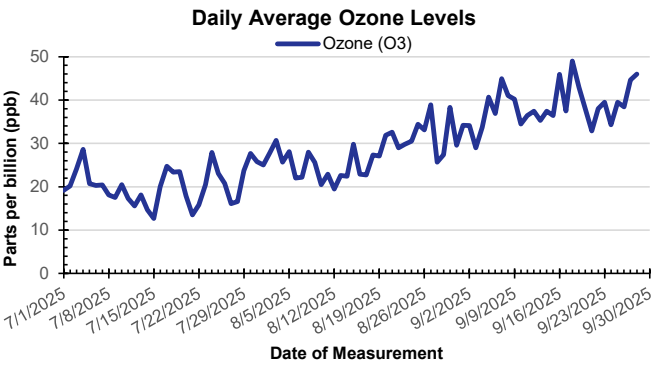
Nitrogen Dioxide (NO_2)

NO_2 is part of a group of pollutants called nitrogen oxides (NOx). It's formed when fuel is burned at high temperatures, such as in vehicles, power plants, and industrial facilities.

Ozone (O_3)

Ozone (O_3) is a highly reactive gas composed of three oxygen atoms. It is both a natural and a man-made product that occurs in the Earth's upper atmosphere. Man-made ozone (Tropospheric or ground-level ozone) is what we breathe. It is formed primarily from photochemical reactions between VOCS and nitrogen oxides (NOx), depending upon the presence of heat and sunlight. *Acceptable ozone levels are 0-70 ppb, and the EPA defines "Good" levels as 0-54 ppb.*





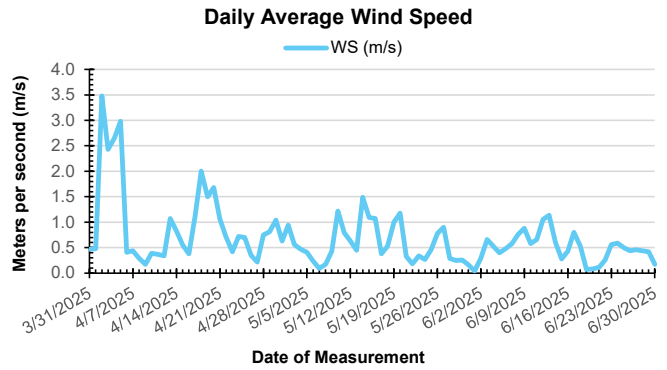
Meteorological Conditions

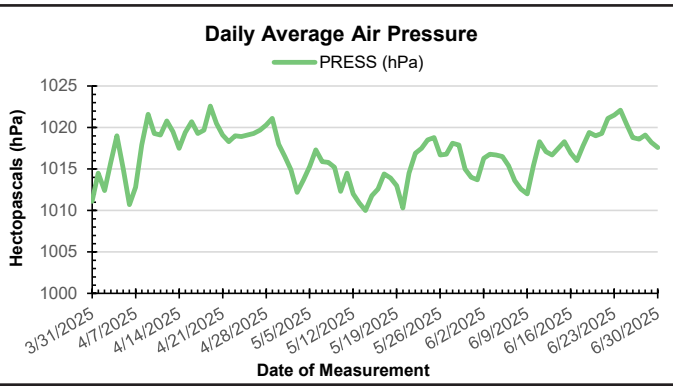
Epes, Alabama

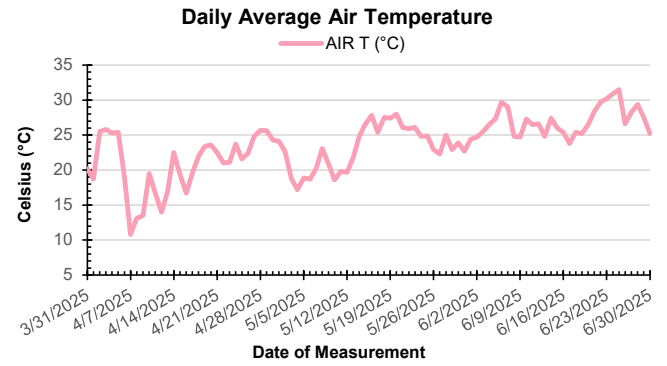
Meteorological conditions, such as temperature, relative humidity, air pressure, precipitation, wind speed, and wind direction, are also important to gather as they impact the distribution of pollutants into the community. For example, wind can carry pollutants further, while certain precipitation like rain can act as a natural air scrubber. Seasonal shifts can also affect changes in air quality.

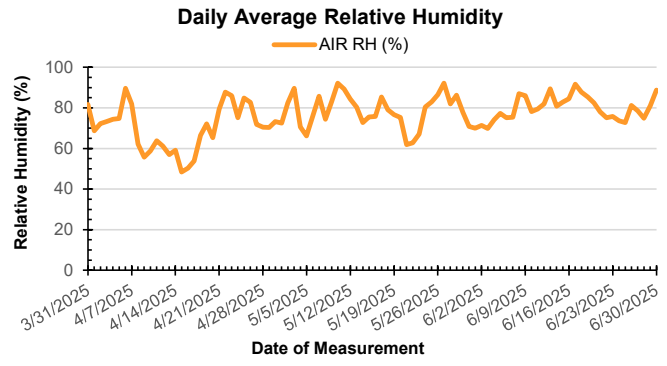
Previous Reported Quarter (Q2)

March 31-June 30, 2025



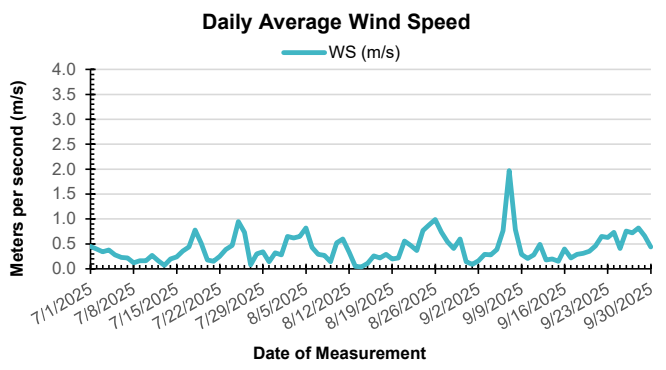


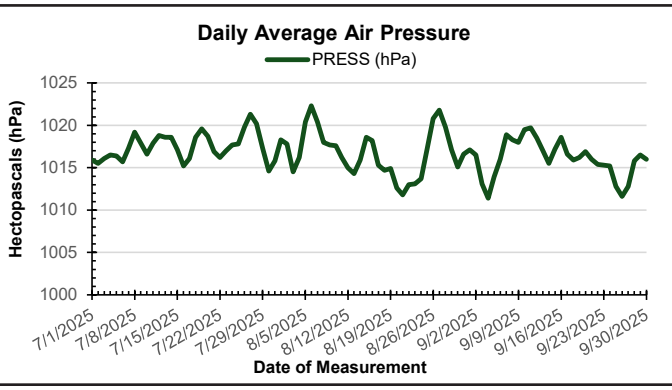


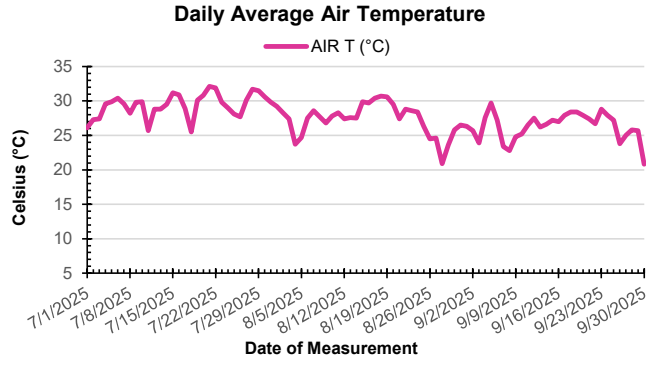


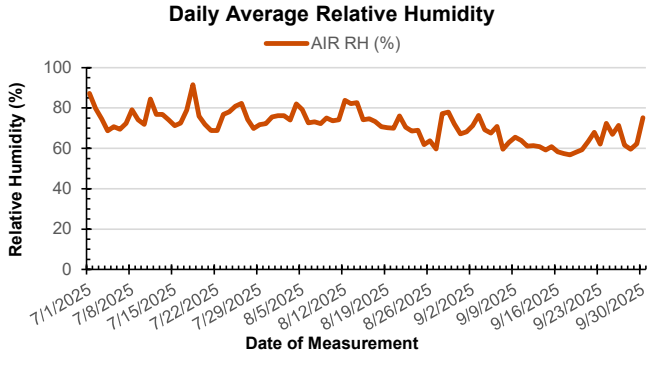
Current Reporting Quarter (Q3)

July 1-September 30, 2025









Coming soon: We will release our community noise reports, which will consist of A-, C-, and Z-weighting sound levels, as well as spectral analysis across the 1/3 octave band.

Key Findings

Epes, Alabama

Observed differences in air quality between the previous quarter and current:

- Average $PM_{2.5}$ and VOC levels had statistically significant increases in July -September, compared to April-June, 2025.
  - Average $PM_{2.5}$ increased by 1.4 µg/m³
  - Average VOCs increased by 1.9 ppb, and the maximum daily average more than tripled (14.6 ppb on September 17th, compared to 4.0 ppb on April 9th).
- Ozone levels were also significantly higher, with an increased average of 4.8 ppb.
- $PM_{2.5}$ had higher minimum and maximum levels during the recent period compared to last quarter– this quarter's maximum was 12.4 µg/m³ (2.5 µg/m³ greater than previous months).

Notable differences in meteorological conditions:

- The relative humidity was lower on average between July and September compared to May-June, but the least humid day (Sept. 18th) was 8.8% more humid than the low last quarter. The average temperature was 4.1°C warmer (about 39°F).
- Wind speeds were lower between July and September compared to the previous months.

Since the plant has not opened in Epes, we hypothesize that the concentrations measured now will be lower than when the plant opens. We are now establishing a baseline.

EPA Guidelines:

The Environmental Protection Agency (EPA) tracks and shares air quality using the Air Quality Index (AQI). This index summarizes measurements of common air pollutants– like Particulate Matter (PM), Sulfur Dioxide (SO_2), Ozone (O_3), Carbon Monoxide (CO), and Nitrogen Dioxide (NO_2) – that shows how clean or polluted the air is.

Each day, an AQI value is calculated for every pollutant, and the highest value becomes the reported daily AQI. The pollutant driving that number is called the "dominant pollutant."

In Mississippi, the EPA operates monitoring sites in **10 counties** (*Bolivar, Desoto, Forrest, Hancock, Harrison, Hinds, Jackson, Lauderdale, Lee, & Yalobusha*). These monitors are less common in rural areas. Not every monitor measures every pollutant, and sometimes not all pollutants are measured each day. For counties without monitoring sites, the EPA estimates AQI levels using nearby monitors and other data sources.

COMMUNITY NOISE LAB™

Are you interested in having an air monitor in your community?

Scan this QR code to learn more about how you and your community can be involved with the Mississippi Air and Noise Pollution Monitoring Network.

Air & Noise Monitoring Network

Air Quality Reports

To view and download all air quality reports for Mississippi and Alabama, scan this QR Code, or visit https://communitynoiselab.org/community-air-and-noise-monitoring-network/

Other Community Noise Lab Projects:

Mississippi Adolescent Environmental Health Study (MAEHS)

CNL is conducting a research study to better understand how your water, soil, air, and noise quality may be impacting the health of you and your children.The MAEHS is a pediatric longitudinal cohort study investigating how air, noise, water, and soil pollution—individually and jointly—impact the health and well-being of children across the state. Scan this QR code to learn more about this study or how to get involved.

MAEHS Info

Environmental Education Activity Books

CNL has developed a series of activity books for children and families to learn about their environments and health through fun and interactive activity books. Scan this QR code to learn more or get a copy of your own! *Topics include:*

- **Protect and Preserve** Learn about sound, noise pollution, and the auditory system.
- **From the Ground to the Glass** Readers learn how water moves from its source to the tap, how water impacts health, and provides resources on managing your tap water's quality.
- **Light. Blight. Sight.** All aspects of visual pollution (including illegal dumping), blue space, green space, eyesight, and visual perception.
- **Period.** *(Designed for girls ages 8 – 12)* An introduction to reproductive anatomy, the menstrual cycle, period products, self-care tips, and environmental factors that may impact reproductive health to empower young girls with the needed knowledge to understand and care for their bodies as they enter into womanhood.
- **The Air Up There** *(Coming Soon)* Air quality, air pollution, and how air can impact our health.

Activity Books

Contact information: Data collection and analysis for this report is provided by Community Noise Lab at Brown University (communitynoiselab.org). You can contact Dr. Erica Walker at erica_walker@brown.edu if you have any questions.

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